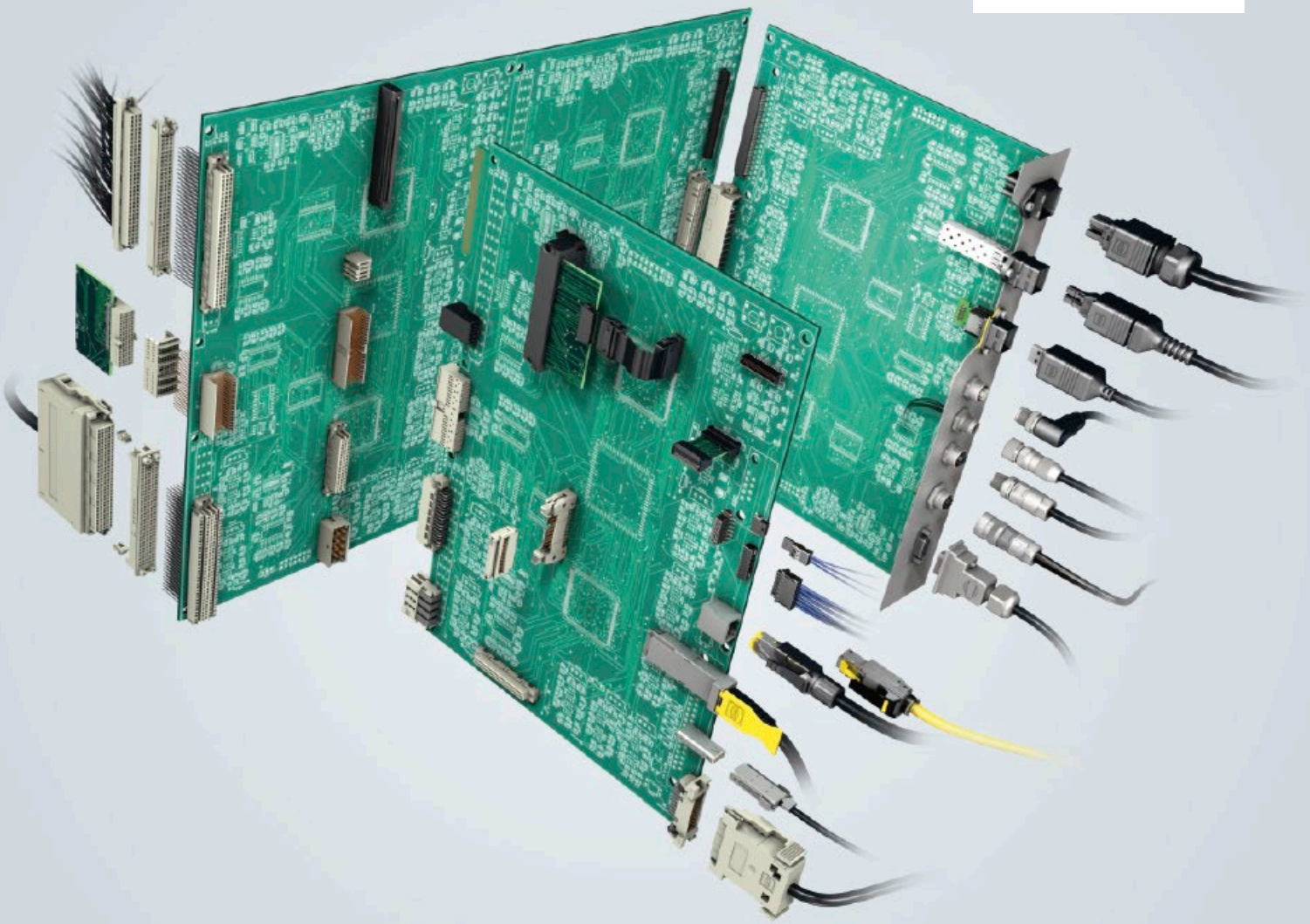
Pushing Performance



People | Power | Partnership

# HARTING
## Device Connectivity

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# Transforming customer wishes into concrete solutions

The HARTING Technology Group is skilled in the fields of electrical, electronic and optical connection, transmission and networking technology, as well as in manufacturing, mechatronics and software creation. The Group uses these skills to develop customized solutions and products such as connectors for energy and data-transmission/data-networking applications, including, for example, mechanical engineering, rail technology, wind energy plants, factory automation and the telecommunications sector. In addition, HARTING also produces electro-magnetic components for the automobile industry and offers solutions in the field of hydraulic technology and shop systems.

The HARTING Group currently comprises 53 sales companies and production plants worldwide employing a total of about 4,200 staff.





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HARTING Subsidiary

HARTING Representation

## We aspire to top performance.

Connectors ensure functionality. As core elements of electrical and optical termination, connection and infrastructure technologies, they are essential in enabling the modular construction of devices, machines and systems across an extremely wide range of industrial applications. Their reliability is a crucial factor guaranteeing smooth functioning in the manufacturing area, telecommunications, applications in medical technology – in short, connectors are at work in virtually every conceivable application area. Thanks to the ongoing development of our technologies, our customers enjoy investment security and benefit from durable, long-term functionality.

## Wherever our customers are, we're there.

Increasing industrialization is creating growing markets that are characterized by widely diverging demands and requirements. What these markets all share in common is the quest for perfection, increasingly efficient processes and reliable technologies. HARTING is providing these technologies – in Europe, the Americas and Asia. In order to implement customer requirements in the best possible manner, the HARTING professionals at our international subsidiaries engage in up-close, partnership-based interaction with our customers, right from the very early product development phase.

Our on-site staff form the interface to the centrally coordinated development and production departments. In this way, our customers can rely on consistently high, superior product quality – worldwide.

## Our claim: Pushing Performance.

HARTING provides more than optimally attuned components. In order to offer our customers the best possible solutions, on request HARTING contributes a great deal more and is tightly integrated into the value-creation process.

From ready-assembled cables through to control racks or ready-to-go control desks. Our aim is to generate maximum benefit for our customers – with no compromises!

## Quality creates reliability – and warrants trust.

The HARTING brand stands for superior quality and reliability – worldwide. The standards we set are the result of consistent, stringent quality management that is subject to regular certifications and audits.

EN ISO 9001, the EU Eco-Audit and ISO 14001 are key elements here. We take a proactive stance towards new requirements, which is why HARTING is the first company worldwide to have obtained the IRIS quality certificate for rail vehicles.



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## HARTING technology creates added value for customers.

Technologies by **HARTING** are at work worldwide. HARTING's presence stands for smoothly functioning systems powered by intelligent connectors, smart infrastructure solutions and sophisticated network systems. Over the course of many years of close, trust-based cooperation with its customers, the **HARTING** Technology Group has become one of the leading specialists globally for connector technology. We offer individual customers specific and innovative solutions that go beyond the basic standard functionalities. These tailored solutions deliver sustained results, ensure investment security and enable customers to achieve significant added value.

## Opting for HARTING opens up an innovative, complex world of concepts and ideas.

In order to develop and produce connectivity and network solutions serving an exceptionally wide range of connector applications in a professional and cost-effective manner, **HARTING** not only commands the full array of conventional tools and basic technologies. Above and beyond these capabilities, **HARTING** is constantly harnessing and refining its broad base of knowledge and experience to create new solutions that also ensure continuity. To secure its lead in know-how, HARTING draws on a wealth of sources from its in-house research and applications.

Salient examples of these sources of innovative knowledge include microstructure technologies, 3D design and connection technology, high-temperature and ultrahigh-frequency applications that are finding use in telecommunications and automation networks, in the automotive industry, or in industrial sensor and actuator applications, RFID and wireless technologies, in addition to packaging and housing made of plastics, aluminum and stainless steel.

## HARTING overcomes technological limitations.

Drawing on the comprehensive resources of the group's technology pool, **HARTING** devises practical solutions for its customers. Whether this involves industrial networks for manufacturing automation, or hybrid interface solutions for wireless telecommunication infrastructures, 3D circuit carriers with microstructures, or cable assemblies for high-temperature applications in the automotive industry – **HARTING** technologies offer not only components, but comprehensive solutions attuned to individual customer requirements and preferences. The range of cost-effective solutions covers ready-to-use cable configurations, completely assembled backplanes and board system carriers, as well as fully wired and tested control panels.

In order to ensure the future-proof design of RF and EMC-compatible interface solutions, the central HARTING laboratory (accredited according to DIN EN ISO/IEC 17 025) employs simulation tools, as well as experimental, testing and diagnostics facilities all the way to Industrial computed tomography. In addition to product and process suitability considerations, lifecycle and environmental aspects play a key role in the selection of materials and processes.





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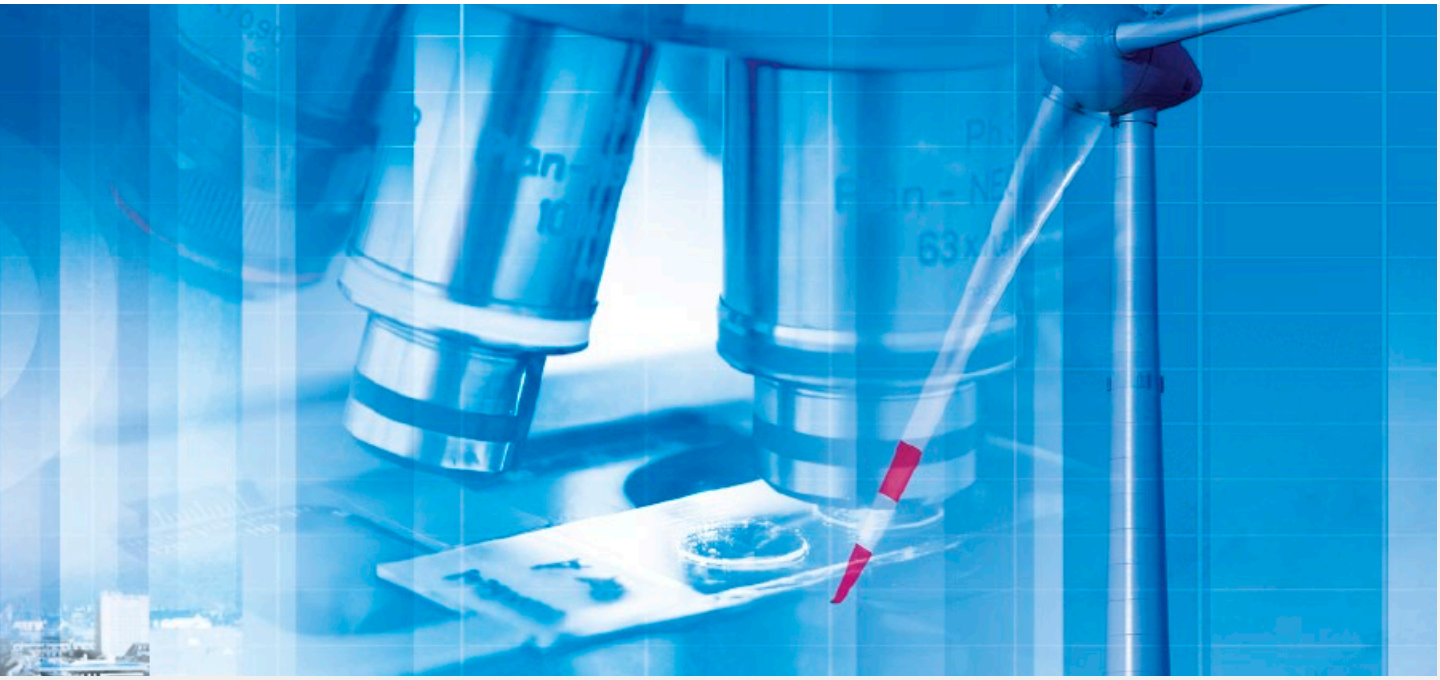
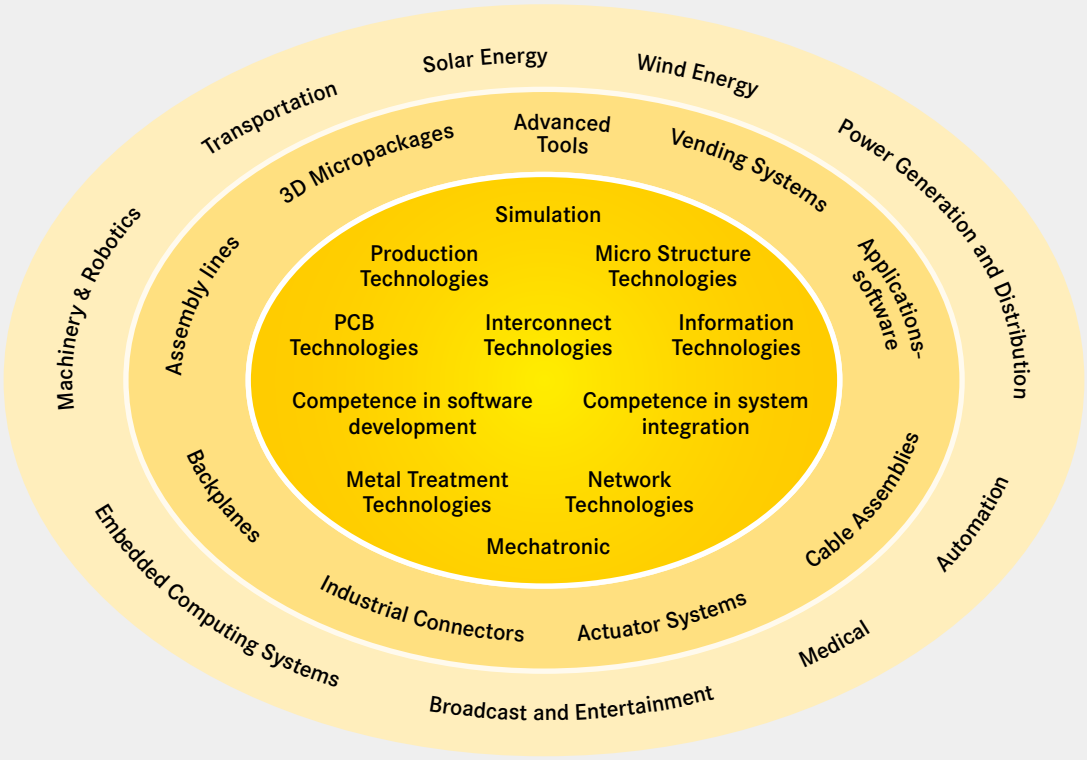


## HARTING's knowledge is practical know-how that generates synergy effects.

HARTING commands decades of experience with regard to the applications conditions involved in connections in telecommunications, computer, network and medical technologies, as well as industrial automation technologies, e.g. in the mechanical engineering and plant engineering areas, in addition to the power generation industry and the transportation sector. **HARTING** is highly conversant with the specific application areas in all of these technology fields. In every solution approach, the key focus is on the application. In this context, uncompromising, superior quality is our hallmark. Every new solution found invariably flows back into the **HARTING** technology pool, thereby enriching our resources. And every new solution we go on to create will draw on this wealth of resources in order to optimize each and every individual solution. **HARTING** is synergy in action.



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## Smart Network Infrastructure

**INTELLIGENT NETWORK SOLUTIONS**

With its product series Ha-VIS, HARTING offers a consistent range of Ethernet network components and cabling products, which form the communication platform of convergent automation IT networks. Under Ha-VIS HARTING offers fully integrated RFID solutions.

## Installation Technology

**INDUSTRIAL CONNECTORS Han®**

This catalogue documents the worldwide standard for industrial connectors. Han® connectors represent the preferential solution in the cable-to-cable interconnection of data, signal and power applications operating under the most demanding conditions and meeting stringent requirements with regard to safe and detachable electrical connections with high degree of protection IP65 / IP67. Installations making use of Han® connectors impress with their rugged design, convenient handling and modularity of data, signal and power connections. Han® connectors represent the worldwide standard in industry, railway technology, as well as in power generation and distribution.

## Device Connectivity

**DEVICE CONNECTIVITY**

The Device Connectivity catalogue provides a universal, innovative product portfolio of PCB connections and of termination technology. The product range comprises board-to-board and cable-to-board connectors for industrial electronic devices with degree of protection IP20 to IP65 / IP67. These HARTING solutions offer appropriate device connectivity for a wide range of devices, ranging from sensors to industrial computers and their respective data, signal and power interfaces.



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# Contents


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| HARTING RJ Industrial® – RJ45 Ethernet Connectors | 01 |
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| Circular Connectors | 03 |
| Industrial Connectors Han® | 04 |
| Subminiature D Connectors | 05 |
| *har-mik*® Interface Connectors – Since 2016 the *har-mik*® product family is not any more part of HARTING's product portfolio. | |
| *har-link*® Interface Connectors | 07 |
| SEK IDC Connectors | 08 |
| DIN 41612 Connectors | 09 |
| Mini Coax Connectors | 10 |
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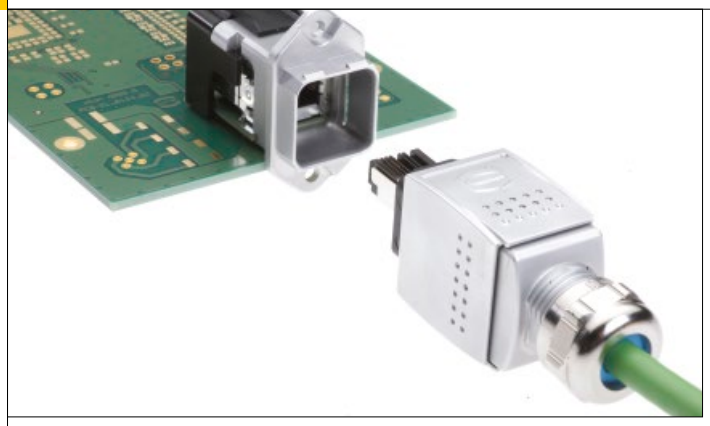
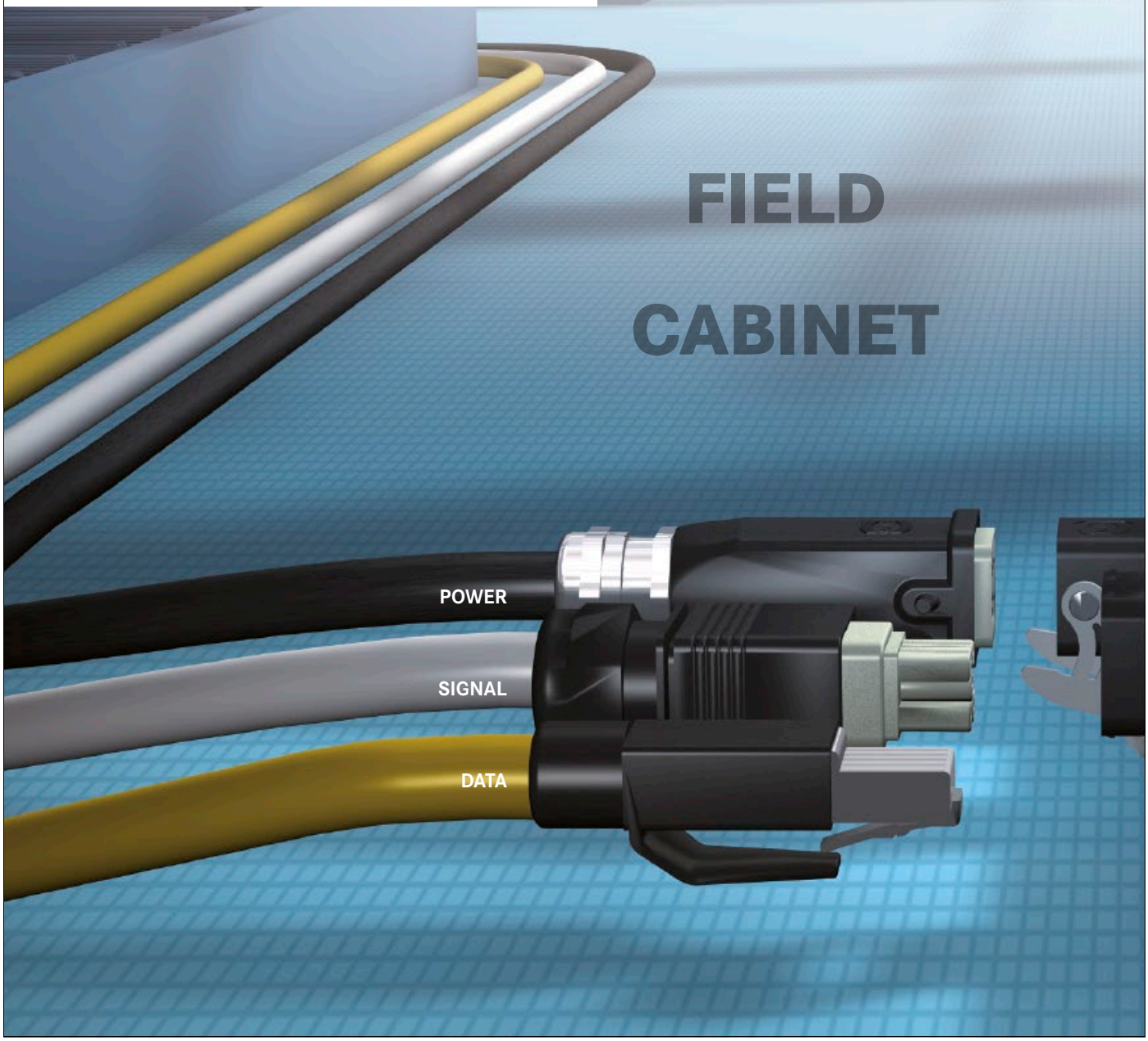


### CABLE- / WIRE-TO-BOARD

Whatever your applications may be, HARTING has the ideal solutions for your data, signal and power connectivity requirements with its matching cable-to-board and wire-to-board technologies with degree of protection IP20 to IP65 / IP67.



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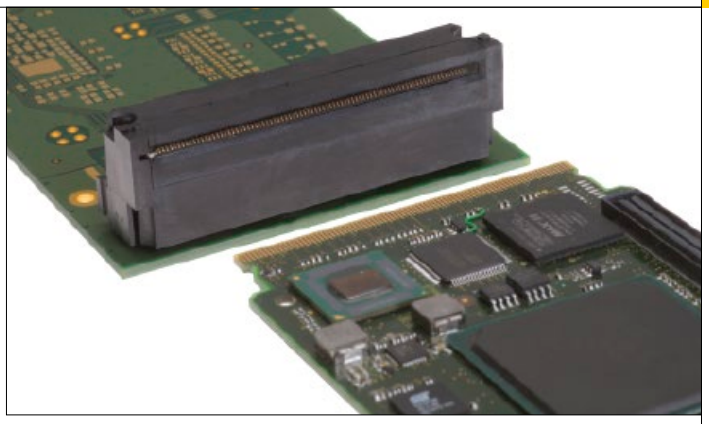
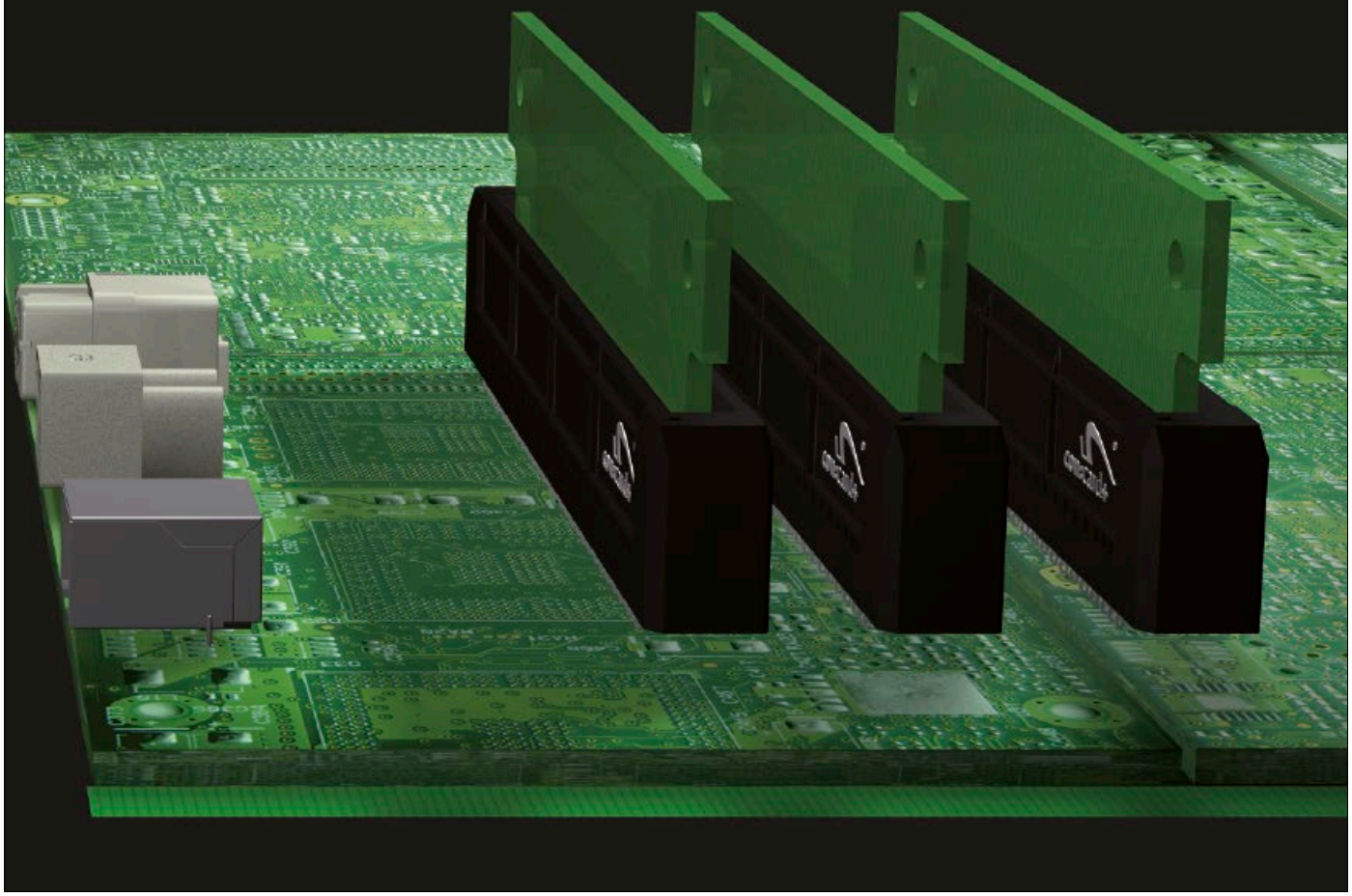


## BOARD-TO-BOARD

Regardless of your device configuration, HARTING always has an ideal board-to-board connector with maximum packing density and optimal performance with regard to signal transmission and integrity.

# DEVICE





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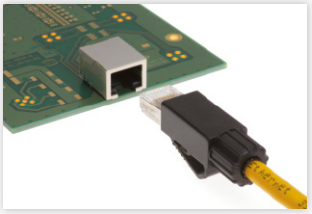
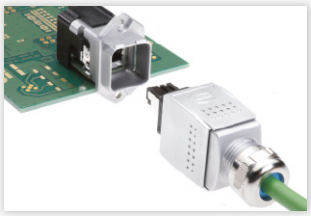
# Device Connectivity product overview



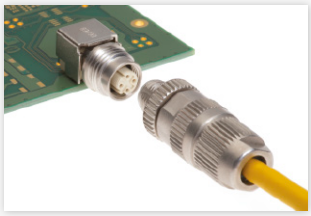
## 01. HARTING RJ INDUSTRIAL® – RJ45 ETHERNET CONNECTORS

HARTING offers a wide range of RJ45 contact inserts and matching RJ45 connectors for quick and reliable termination of your 2- or 4-pair Ethernet cables. The RJ Industrial connector family also supports Ethernet automation profiles such as PROFINET, Ethernet/IP, EtherCAT and Powerlink. The HARTING RJ Industrial® connectors provide standard RJ45 connection technology for the industrial field level.



## 02. PushPull CONNECTORS

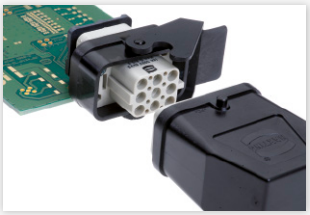
HARTING has set the standard for connection technology for innovative IP65 / IP67 installation concepts with its new generation of the PushPull series. The multifunctional PushPull connector is available for data, signal and power applications and provides a concept with many connector mating faces. The universal PushPull product line is complemented by additional interfaces such as USB, LC or SCRJ.



## 03. CIRCULAR CONNECTORS

HARTING offers a comprehensive portfolio of M8, M12, M23, 7/8“ and Han-Max® circular connectors for industrial applications. In addition to assembled system cables, HARTING also offers connectors with *HARAX*® fast termination technology for onsite installation directly in the field.

Power

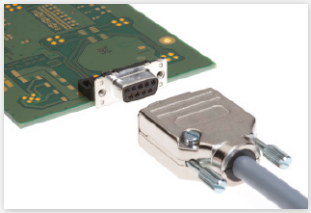


## 04. INDUSTRIAL CONNECTORS Han®

Han® industrial connectors with degree of protection IP65 / IP67 represent the worldwide connector standard with regard to safe installation, efficient commissioning and servicing of machines and plants

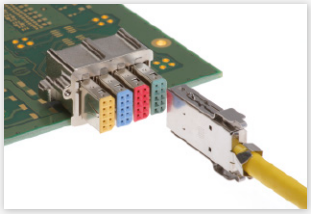
Signal

Data



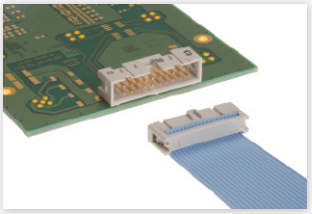
## 05. Subminiature D Connectors

D-Sub connectors are a classic solution for cable-to-board applications. Thanks to their versatility, they represent a universal solution for applications in the field of device connectivity, and offer a wide range of data, signal and power connection technology for applications in automation systems.



## 07. *har-link*® INTERFACE CONNECTORS

The *har-link*® connector is characterized by its ability to handle the highest data rates in combination with perfect shielding functions. HARTING complements the *har-link*® connector family by assembled system cables with shielded and unshielded twisted-pair design.



## 08. SEK INSULATION DISPLACEMENT CONNECTORS

IDC connectors for flat ribbon cables facilitate the simple and cost-effective configuration of devices and are preferably implemented as internal connections. HARTING offers a wide range of these cable-to-board connectors.



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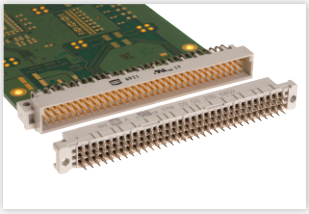
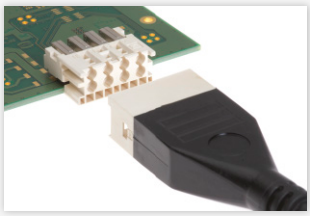


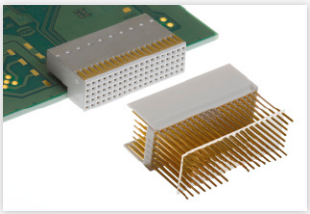
### 09. DIN 41 612 CONNECTORS

For many years, connectors to DIN 41 612 have established themselves as a standard both for board-to-board and cable-to-board applications. HARTING offers a wide product range of DIN 41 612 connectors for data, signal and power lines, including corresponding accessories.



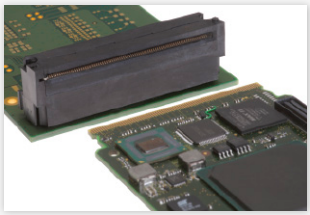
### 10. Mini Coax CONNECTORS

Mini Coax connectors facilitate multi-channel, coaxial and highfrequency data transmission for board-to-board and cable-to-board applications. Device integration is supported with straight and angled contact inserts with press-in technology and SMT/SMC. The housings support applications up to IP65.



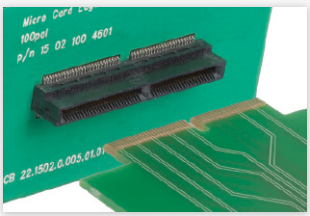
### 11. *har-bus*® *HM* CONNECTORS

*har-bus*® *HM* connectors form the basis for the assembly of high-performance backplanes for control systems and for industrial computer systems with 19“ technology. The board-to-board connectors are available with press-in technology for backplanes and solder versions for sub-boards.



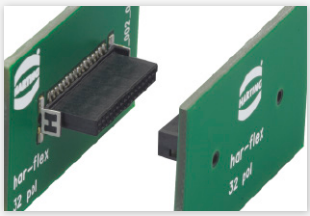
### 12. TCA CONNECTORS

TCA connectors represent the next generation of backplane connectors. Their new concept supports direct or indirect connection. TCA connector versions are available for connecting data channels and the power supply to the modules.



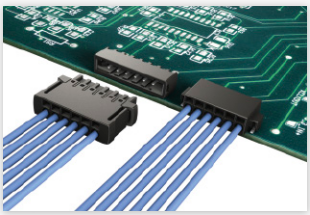
### 13. MICRO CARD EDGE CONNECTORS

The HARTING Micro Card Edge connector for applications requiring board-to-board mezzanine or small pluggable daughter card connections. The key feature is the very flexible stacking height of parallel boards by utilizing a small board between the connectors.



### 14. *har*-flex® CONNECTORS

HARTING’s new *har*-flex® connector series is a space-saving, rugged and flexible PCB connector for the widest range of board-to-board and board-to-cable applications. In addition to straight connector models, the product family also includes compatible insulation displacement connectors, along with angled models.



### 15. *har*-flexicon® PCB TERMINAL BLOCKS AND CONNECTORS

*har*-flexicon® is the robust PCB termination technology for single wires. Components for the termination of industrial devices in the pitches of 1.27 mm, 2.54 mm, 3.50/3.81 mm and 5.00/5.08 mm are available. All components are particularly suited for reflow-soldering on the PCB and offer field assembly with PushIn and insulation displacement termination for single wires.



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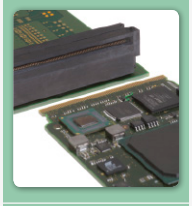
| PRODUCT GROUP | CONNECTION TYPE | | ENVIRONMENT | | |
|---|---|---|---|---|---|
| | Board to Board | Cable / Wire to Board | IP20 | IP65 / IP67 | Data |
| |  | | | | |
| 01 HARTING RJ Industrial® – RJ45 Ethernet Connectors | | ● | ● | | ● |
| 02 PushPull Connectors | | ● | | ● | ● |
| 03 Circular Connectors | | ● | | ● | ● |
| 04 Industrial Connectors Han® | | ● | | ● | ● |
| 05 Subminiature D Connectors | ● | ● | ● | ● | ● |
| 07 *har-link*® Interface Connectors | | ● | ● | | ● |
| 08 SEK IDC Connectors | | ● | ● | | ● |
| 09 DIN 41 612 Connectors | ● | ● | ● | | ● |
| 10 Mini Coax Connectors | ● | ● | ● | | ● |
| 11 *har-bus*® *HM* Connectors | ● | | ● | | ● |
| 12 TCA Connectors | ● | | ● | | ● |
| 13 Micro Card Edge Connectors | ● | | ● | | ● |
| 14 *har-flex*® Connectors | ● | ● | ● | | ● |
| 15 *har-flexicon*® Connectors and PCB terminal blocks | | ● | ● | | ● |



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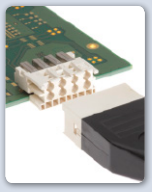
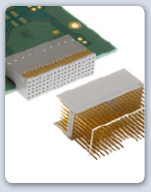
| APPLICATION | | | | | | APPLICATION STANDARD |
|---|---|---|---|---|---|---|
| Signal | Power | high performance | | | | |
| | | Data rate | Shielding | Number of poles/ contact density | Voltage/ current | |
| | |  | |  | | |
| | | *10 Gbit category $6_A$ | | | | EtherNet/IP, ISO IEC, EtherCAT, IEEE, POWERLINK |
| | | *10 Gbit Cu & LWL | | | | EtherNet/IP, ISO IEC, EtherCAT, POWERLINK |
| | | | | | | EtherNet/IP, DeviceNet, EtherCAT, CANopen, POWERLINK |
| | | *10 Gbit Cu & LWL | | | *40 A @ 400 V | EtherNet/IP, ECOFAST |
| | | | | *max. 78 contacts | *40 A 4 kV | EtherNet/IP, DeviceNet, CANopen |
| | | *> 1.5 Gbit | *50 dB @ 1 GHz | | | |
| | | | | *max. 64 contacts | | |
| | | | *35 dB @ 2 GHz | *max. 160 contacts | *40 A 2.8 kV | VMEbus |
| | | *4 GHz | *> 45 dB @ 4 GHz | | | VMEbus |
| | | | | *max. 535 contacts | | VMEbus, CompactPCI, AdvancedTCA |
| | | *> 6 Gbit | | *max. 170 contacts | *16 A | CompactPCI, AdvancedTCA |
| | | * 14 Gbps | | *max. 100 contacts | | |
| | | | | *max. 100 contacts | | |
| | | | | *max. 25 contacts | *600 V / 17.5 A | |



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# We ensure convincing connectivity for each and every device you bring to the markets.

HARTING will develop the ideal connectivity for your devices in cooperation with your product management and device developers. For us, this means: Design-in support.

## HARTING, THE SPECIALIST FOR INDUSTRIAL DEVICE CONNECTIVITY

The versatility of industrial electronic devices and the potential solutions for device connectivity go hand in hand.

HARTING supports industrial electronic systems with a wide standard portfolio of device connectivity for data, signal and power applications.

This portfolio facilitates the comfortable and quick implementation of the majority of connectivity solutions. Future device generations are frequently subject to specific requirements in terms of their interfaces. In order to implement Device Connectivity solutions that are tailored to these requirements, we utilize all expert resources of the HARTING Technology Group, drawing on our in-house development, tool production, extensive vertical range of manufacture and our accredited test laboratories. The connectivity of future industrial device generations is driven by market trends towards minimization of sizes, increase of performance and utilization of Ethernet communication with rapidly rising transmission rates. Consequently, as one of the leaders on the telecommunication connectivity market, HARTING integrates the knowledge acquired in this market segment to develop new Device Connectivity for industrial devices.

The MicroTCA telecommunications connector, for example, is implemented as a board-to-board connector for the latest devices in the field of drive control and computer technology. The new generation of PushPull connectors is also used as a robust IP67 cable-to-board solution in both market application segments. These applications have formed a general trend of convergence in the field of device connection technology. HARTING offers more than innovative device connectors, as the connectivity provided by HARTING extends far beyond conventional connector offerings, and covers the entire range of connectors, assembled units and complete backplane solutions.

## HARTING IS YOUR PARTNER IN THE DESIGN-IN PROCESS

Our field service department is your first contact partner in terms of the selection and design of the ideal connectivity solution for your device. This service is supported by HARTING's technical application support with device-specific knowledge.

HARTING also places a team of experts in the fields of RF, EMC, housing technology, mechanical strength, high-current applications and installation concepts (cabling classes) at your disposal. These capabilities allow us to simulate your applications in advance and test it in the course of development in an accredited laboratory.

The HARTING Technology Group holds all the key technologies for integrated device connectivity, such as connection technology for PCBs based on SMD, THT, THR or press-fit technology and develops connectivity solutions for international standardization in cooperation with user groups.

The latest generation of PushPull connectors was developed in cooperation with the German automotive industry and subsequently standardized on an international level.

You determine which part of the design-In process should be handled by HARTING.

There are three ways of finding the ideal device connectivity with HARTING:

1. You select the suitable device connection technology from the DeviceCon catalog and handle the design-in by yourself with the help of our technical applications support.
2. You define the scope of requirements for the device interfaces. HARTING supports you in selecting the device connection technology, with the focus always set on choosing the ideal connection technology for device integration.
   HARTING also holds the respective know-how for handling the entire design and the production of custom assembled units or backplanes.
3. You plan a new device generation with individualized device connectivity, which is defined in the course of a joint project. The result is a tailored, cost-effective solution for your series product and the differentiation of such products thanks to innovative device connectivity.

Whichever procedure you may prefer, you can always count on unrestricted HARTING support, as we are dedicated to ensuring convincing connectivity for each and every device you bring to the markets.



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The **HARTING eCatalogue / eShop** can be found on our homepage at **www.HARTING.com** or at the direct link **www.eCatalogue.HARTING.com**.

The HARTING e-Catalogue is your platform for conveniently selecting individual products as well as configuring complete solutions. Our comprehensive product pages provide you with all necessary technical information and CAD files in various formats for downloading. You may also contact our technical sales department directly.

Find out about **product innovations and news** on the start page of the HARTING e-Catalogue or go directly to **www.product-news.HARTING.com**.

Registered users can take advantage of MyHARTING to check on availability or prices, and to place or track their orders. Here, your customized „HARTING history“ provides you with a list of your inquiries, quotations and more.

Sign up now for your free e-Catalogue account at HARTING!

**www.eShop.HARTING.com**

## Product samples: Fast-track delivery to your desk, free of charge

The new free express sample service in the HARTING eCatalogue allows customers to order samples immediately, easily and completely free of charge. A broad selection from the device connectivity product portfolio is now available. If a product is unavailable, the system offers alternative products with similar features that can be requested at a mouse click.

The free samples are shipped within 24 hours at no cost to you. This service enables tremendous flexibility, especially in the design phase of projects.

**General information**

It is the customer’s responsibility to check whether the components illustrated in this catalogue also comply with different regulations from those stated in special fields of applications.

We reserve the right to modify designs or substance of content in order to improve quality, keep pace with technological advancement or meet particular requirements in production.

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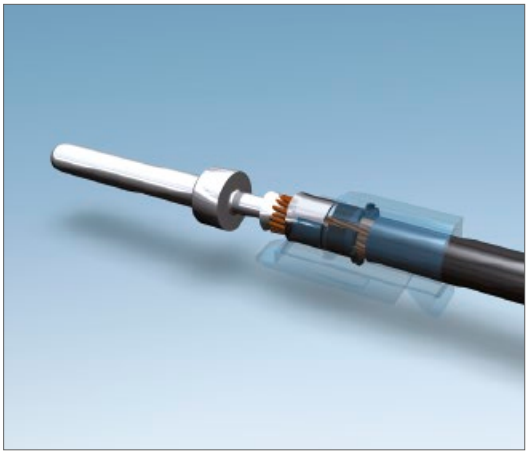
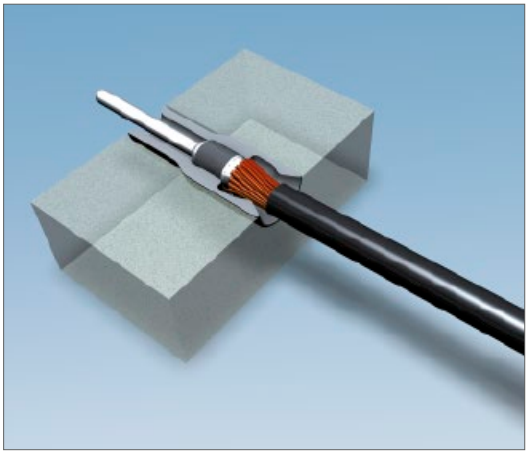


### 1. Han-Quick Lock® SPRING CLAMP TECHNOLOGY

The Quick Lock® radial spring clamp technology combines the benefits of a spring-loaded contact with crimp technology. The result is a simple and vibration-proof wiring technology with the crimp technology contact grid. Quick Lock® technology is suited for wiring flexible conductors. The stranded wires are split up by means of a center mandrel and are then pressed onto this mandrel by means of radial spring force. The spring is opened and activated using a standard screwdriver, which ensures convenient on-site termination, repair or service work.

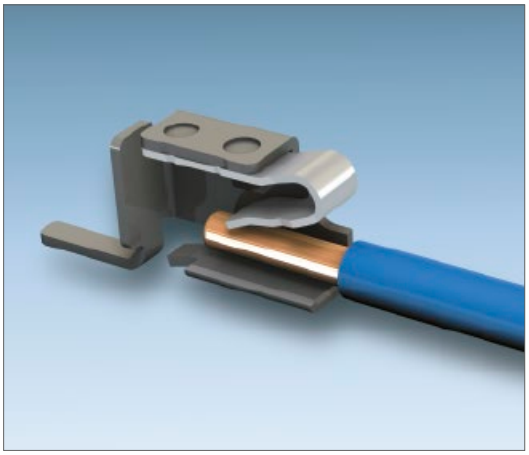


### 2. AXIAL SCREW TERMINALS

Flexible stranded wires inserted into axial screw terminals are split up by a center mandrel and are then pressed onto the outer wall of the contact by screwing down the mandrel. This vibration-proof connection technology is also a convenient solution for repair work and is capable of handling conductor cross-sections to 100 mm$^2$. The axial screw terminal is an ideal alternative to applications that required special crimp tools for wiring large conductor cross-sections.

### 3. CAGE CLAMP TERMINALS

The cage clamp terminal technology is used to terminate flexible and solid conductors by means of spring force. After the spring has been opened by an actuator element, the stripped conductor is simply inserted into the contact chamber. This connection technology requires minimum operating expense and is characterized by its high functional safety. The spring-loaded connection also allows thetermination of more than one wire per contact and excels with high vibration and shock resistance.



### 4. PUSH-IN SPRING CONNECTION

Push-in spring connector technology connects flexible and solid conductors by means of a spring. In a time-saving manner rigid conductors and flexible prefabricated conductors with wire-end ferrules can be connected directly, without the need for tools. Push-in spring connector technology ensures low insertion force and high conductor withdrawal force, and multiple connections are possible. When it comes to flexible conductor connection, before plugging in the terminal point should be opened via the activation element or with a suitable screw-driver.



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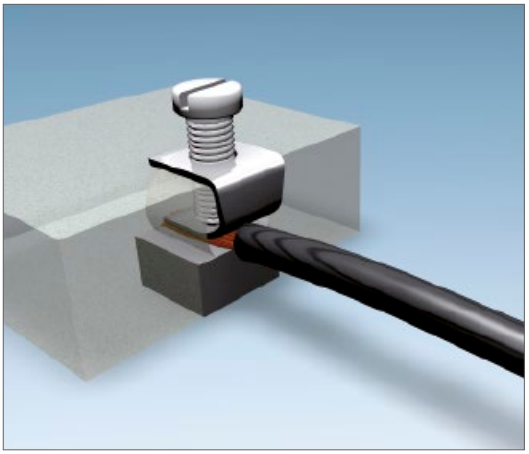
## 5. SCREW TERMINALS

The screw terminal represents classic connection technology, with screws retaining the stripped conductors in the contact chambers. Screw technology is suited for wiring solid and flexible conductors. Screw terminals with wire protection allows the insertion of stranded wire into the contact chamber without a ferrule. Handling screw terminal technology requires nothing more than a screwdriver. The pull out forces of screw terminal technology are standardized in IEC 60 999-1.

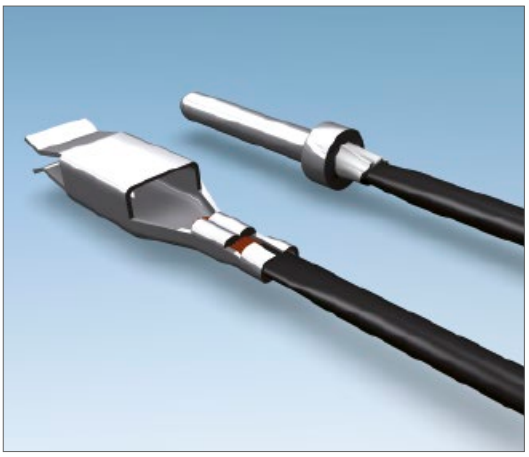


## 6. IDC INSULATION DISPLACEMENT TERMINALS

IDC (insulation displacement contact) technology facilitates the simple and safe termination of solid and flexible conductors. With IDC technology, a blade cuts through the wire insulation and produces an elastic termination in a single pass. This gas-proof connection provides maximum safety even for the lowest currents and voltages. *HARAX*® Fast termination technology is a special feature offered by HARTING which combines the insulation displacement connector with a wire guide element for conveniently producing on-site field installation without special tools. Technical requirements for IDC technology are standardized in IEC 60 352-3.

## 7. CRIMP TERMINALS

Gas-proof and the miniaturized contact technology are synonymous with crimp technology. The flexible conductor is inserted into the crimp contact and is retained by controlled deformation. This technology is similar to a cold welding process and provides maximum aging resistance and mechanical resistance to shock and vibration. Crimp machines facilitate the efficient, streamlined production of system cable assemblies, and crimp technology can also be deployed for field assemblies using the corresponding hand crimp tools. The technical requirements for crimp technology are standardized in IEC 60 352-2.





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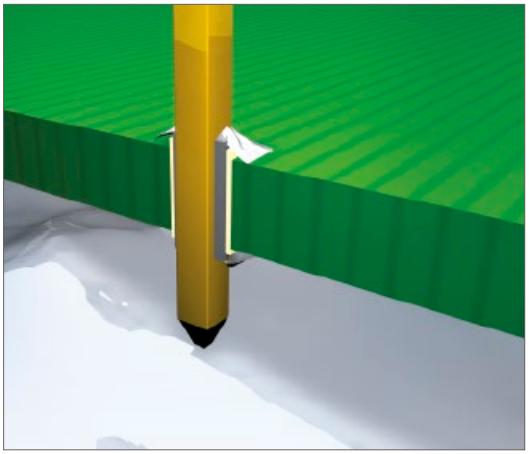
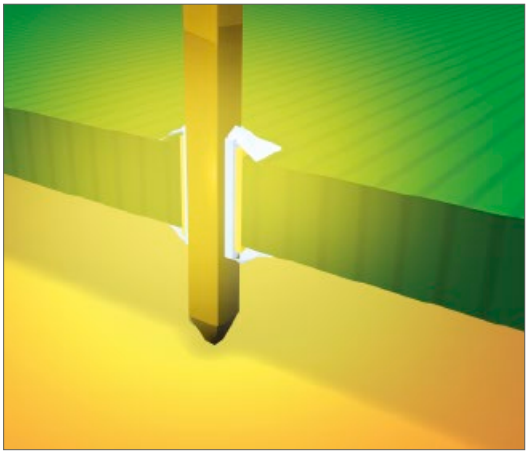


## 8. THT SOLDERING TECHNOLOGY

Proven over decades, standard soldering technologies deliver maximum stability and process reliability.

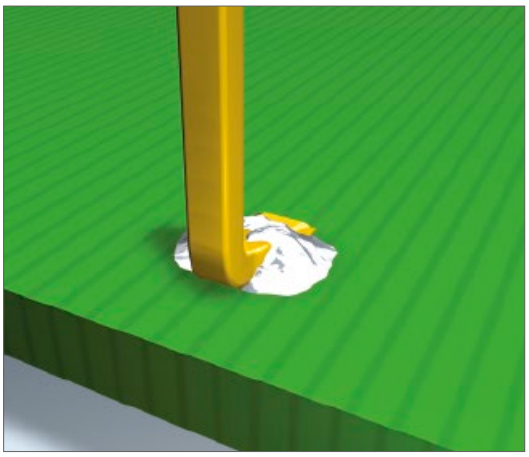
The soldering pins of the connectors are inserted into the through-plated PCB holes and can then be soldered simultaneously with other components in a wave soldering process.



## 9. SMC SOLDERING TECHNOLOGY

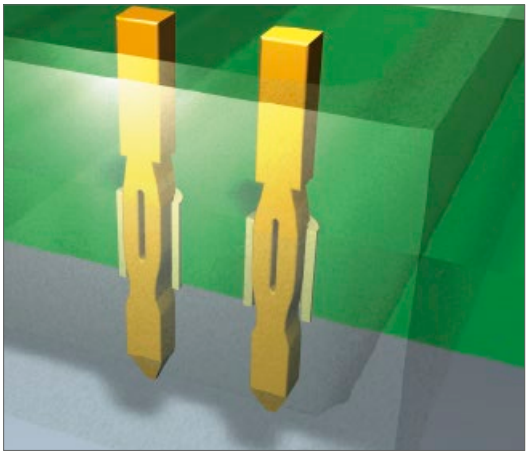
The connector is inserted into through-plated PCB holes similar to standard component assembly for processing with SMC (Surface Mount Compatible) soldering technology. Insertion of these SMT components can be automated by means of Pick & Place assembly in preparation for a reflow soldering process together with the surface-mounted component.

This connection technology is characterized by high mechanical strength and is facilitated by a design that is specially adapted to the reflow soldering process (high-temperature materials).



## 10. SMT SOLDERING TECHNOLOGY

By contrast to through-plated assembly, the SMT (Surface Mounted Technology) connectors are soldered directly onto the PCB surface by means of soldering pads. This process represents a uniform connection technology for PCB assembly and offers the advantage of SMT connectors that do not require separate wave soldering.



## 11. PRESS-IN TECHNOLOGY

This solder-free connection technology is based on press-in mounting of a pin in a through-plated PCB hole. The implementation of a state-of-the-art, flexible press-fit zone allows for the compensation of tolerances of PCB holes and meets high electrical and mechanical requirements for properties such as low press-in forces and high holding forces.

Press-in technology supports unlimited cost efficient processing, especially of pins with selective gold plating for backplane bus systems.



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# Notes





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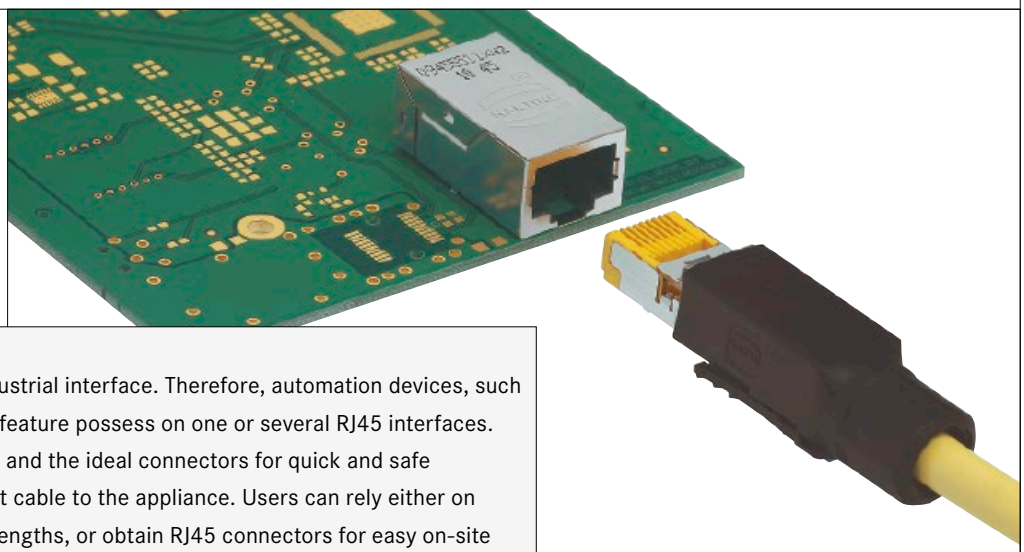
# 01. HARTING RJ Industrial® – RJ45 Ethernet Connectors



Ethernet is coming up to standard industrial interface. Therefore, automation devices, such as controllers, sensors and actuators feature possess on one or several RJ45 interfaces. HARTING offers the matching sockets and the ideal connectors for quick and safe connection of the 2- or 4-pair Ethernet cable to the appliance. Users can rely either on ready-to-use patch cables in various lengths, or obtain RJ45 connectors for easy on-site dressing of the cables without using special tools.

HARTING relies on the *HARAX*® quick connection technology for on-site preparation of cables, meeting all industrial requirements made on safe and durable contacting.

The HARTING RJ Industrial® connector family also supports Ethernet automation profiles such as PROFINET, Ethernet/IP, POWERLINK and EtherCAT for the integration of RJ45 connection technology at field levels.

*Application profile:*

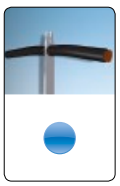
| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| | ● | ● | | ● | | | ● | ● | | |

## Cable termination

*Han-Quick Lock*®

*Screw*

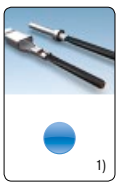
*IDC HARAX*®



●

*Cage clamp*

*Crimp*

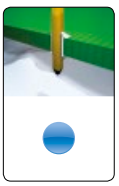


●[1]

*Axial screw*

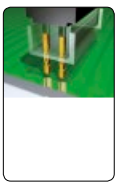
## PCB termination

*THT*

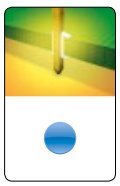


●

*Press-in*

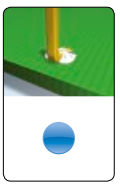


*SMC*



●

*SMT*



●

## Application standard

PROFINET, EtherNet/IP, IEEE 802.3, ISO IEC 24702, ETHERNET POWERLINK, EtherCAT Technology Group

## Housing integration

*Separate housing*

*integrated housing*

[1] Piercing contacts

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# 01. HARTING RJ Industrial® – RJ45 Ethernet Connectors



## Contents


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| HARTING RJ Industrial® RJ45 – Jacks for device integration and accessories | **01.04** |
| HARTING RJ Industrial® RJ45 – Coupler and adapter pcb's | **01.09** |
| HARTING RJ Industrial® RJ45 – Connectors, 4-poles | **01.14** |
| HARTING RJ Industrial® RJ45 Gigalink – Connectors, 8-poles | **01.18** |
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| *har*-port – Coupler | **01.36** |




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# 01. HARTING RJ Industrial® – RJ45 Ethernet Connectors

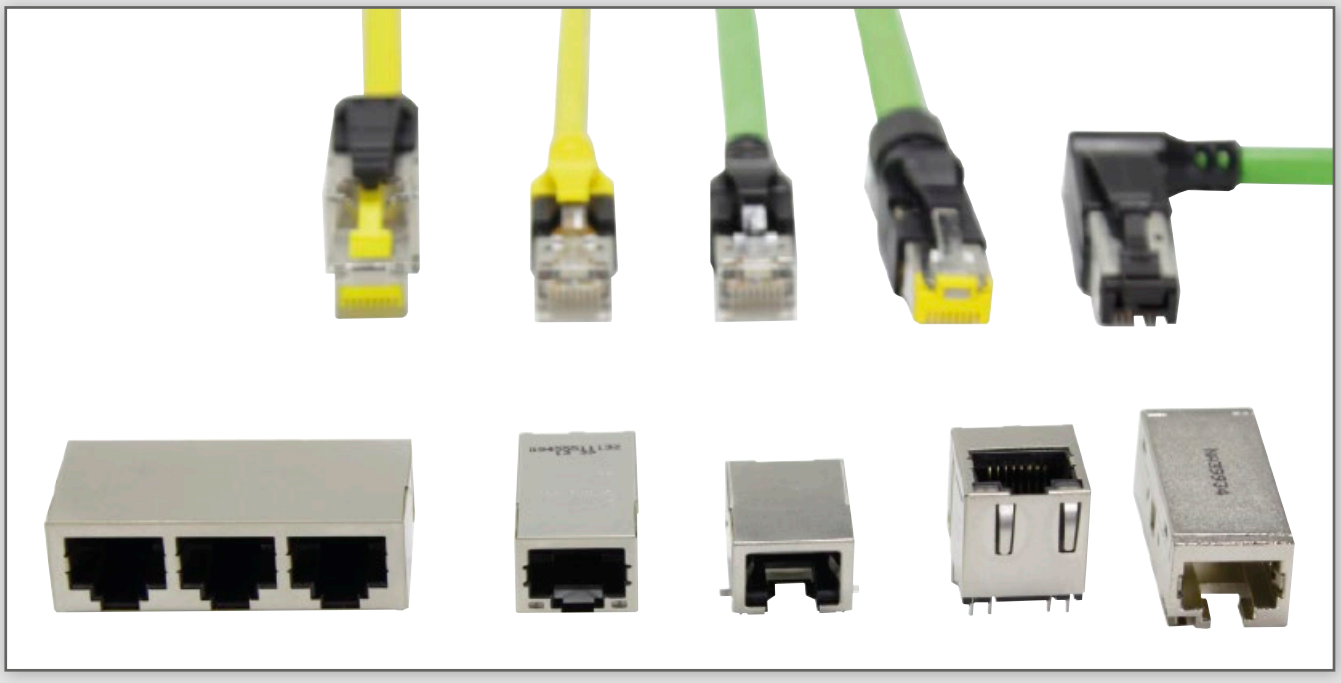


The modular HARTING RJ Industrial® connector family is based on the standard RJ45 pin profile and was developed especially for use in rugged industrial environments.
This technology charts a new course in the wiring of appliances with Ethernet interfaces, enabling the on-site configuration of connectors for many industrial applications, no matter if the product is a power connector or a communications connector.
For the fast wiring of all Ethernet networks, HARTING relies consistently on the *HARAX*® IDC connection technology which has proved its worth in many industrial applications.
Solid or flexible conductors up to a cross-section of AWG 22 are terminated by IDC technology, without stripping or using any special tool.
For all Gigabit Ethernet networks HARTING offers the 8-pole data module with piercing connection technology and the new 8-pole data module with *HARAX*® quick termination technology.
All data modules have the same dimensions.

The replacement of the data module enables the conversion of any 100 MBit Fast Ethernet network into a Gigabit Ethernet network using HARTING RJ Industrial® connectors. This innovative platform strategy also permits the use of the RJ45 data module in combination with the PushPull, Han-Max® and Han® 3 A connector families.
Based on this data module, HARTING has developed a comprehensive connector family which covers all applications for Fast Ethernet, 1/10 Gigabit Ethernet, PROFINET, Ethernet/IP and other Ethernet profiles in the industrial environment.
Degree of protection IP20 is available for the standard RJ45 connectors, either for configuration in the field, or as molded system patch cable.

## APPLIANCE INTEGRATION:

HARTING offers various RJ45 jacks for direct mounting on the PCBs of appliances.





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# Special series features

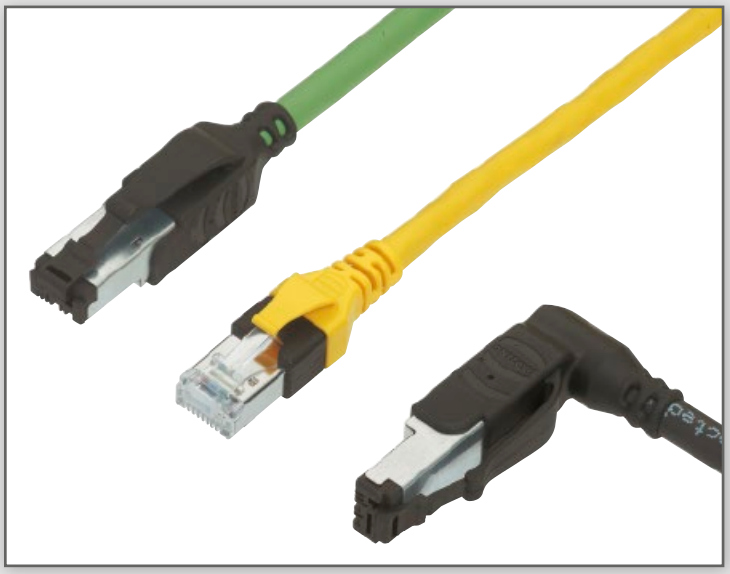


### RJ45 QUICK CONNECTION WITH *HARAX*®:

The HARTING *HARAX*® quick connection technology is the ideal solution for dressing RJ45 connectors on-site. In order to produce a gas-proof and vibration resistant Ethernet connection, users only have to strip the cable insulation, insert the conductors, terminate the shielding plates and close the connector.
*HARAX*® is the most convenient handling standard connection for Ethernet where the emphasis is set on the assembly of connectors in the field.
*HARAX*® is an ideal IDC connection technology which is deployed universally in a very wide range of data, signal and power series.

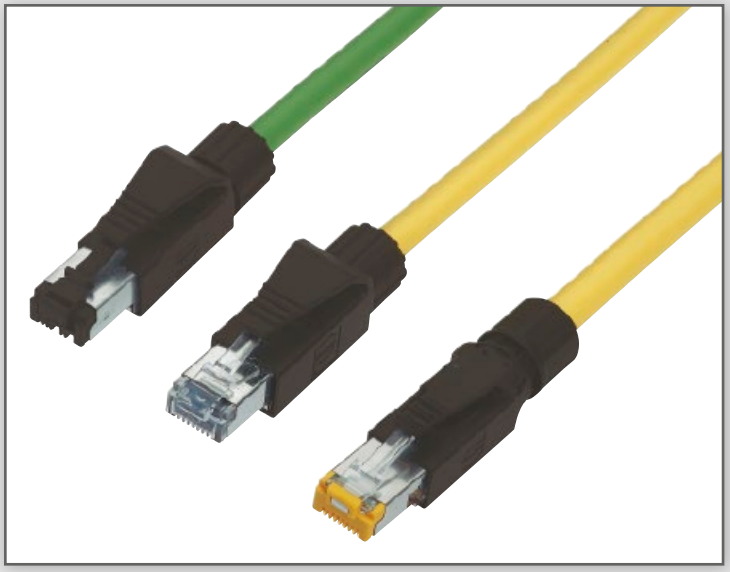
### ASSEMBLED SYSTEM CABLES:

HARTING offers a comprehensive range of ready-to-use RJ45 system cables for the simple and easy connection of Ethernet devices. HARTING also provides assembled and tested system cables for special Ethernet profiles such as PROFINET and Ethernet/IP.
The range of solution comprises star quad, double-pair and four-pair cables of diverse structure, as required in drag chain applications, for example.
Consequently, HARTING system cables can be deployed in all Ethernet applications and all ambient conditions.



### PERFORMANCE FOR THE FUTURE:

The HARTING RJ Industrial® portfolio offers a wide range of solutions for Industrial Ethernet, independent of wiring strategies to ISO/IEC 11 801 currently deployed to wire appliances.
HARTING RJ Industrial® provides field connection technology based on 2-pair category 5 variant and on 4-pair category 6 variant.
HARTING RJ Industrial® is ideal for the future-proof planning of appliance interfaces, regardless of whether your future applications will involve Fast or Gigabit Ethernet, or 10 Gigabit Ethernet.





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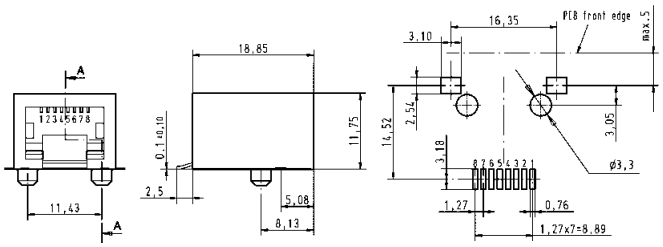
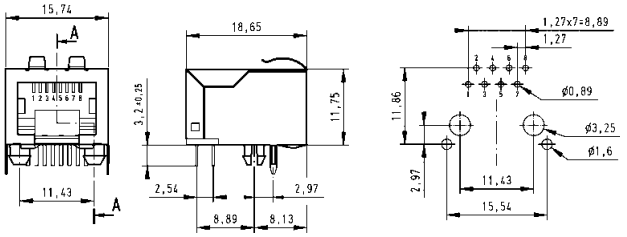
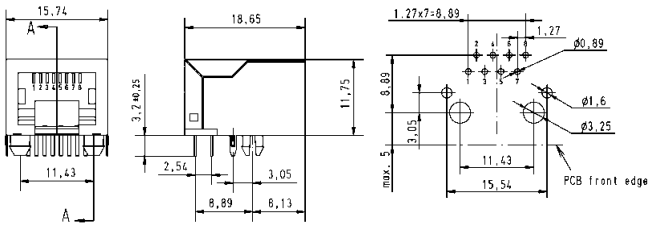
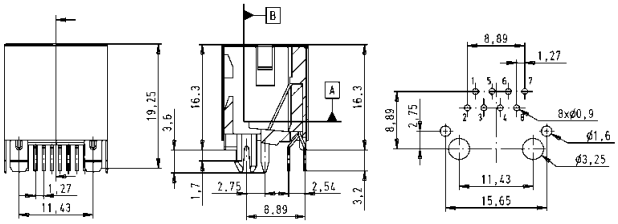
HARTING RJ Industrial® RJ45 jacks for direct device integration

## Advantages

- Compact design
- Category of transmission Cat. 5
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Temperature range -40 °C … +70 °C

## Technical characteristics

| | |
|---|---|
| Locking | RJ45 acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Degree of protection | IP20 |
| Rated voltage | 125 V AC |
| Rated current | 1.5 A |
| Mating face | RJ45 acc. to IEC 60603-7 |
| Mating cycles | min. 750 |
| | UL approval |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Components device side | | | PCB layout, component side |
| RJ45 jack (low profile) | | | |
| Solder variant SMD, 90° angled | 09 45 551 1100[1]<br>09 45 551 1110[2] |  | |
| Solder variant THT, 90° angled with EMC contacts | 09 45 551 1101[1] |  | |
| Solder variant THT, 90° angled | 09 45 551 1102[1] |  | |
| Solder variant THT, vertical | 09 45 551 1103[3] |  | |

[1] Packaging: Blister à 120 pieces
[2] Packaging: Tape & Reel à 130 pieces
[2] Packaging: Blister à 80 pieces



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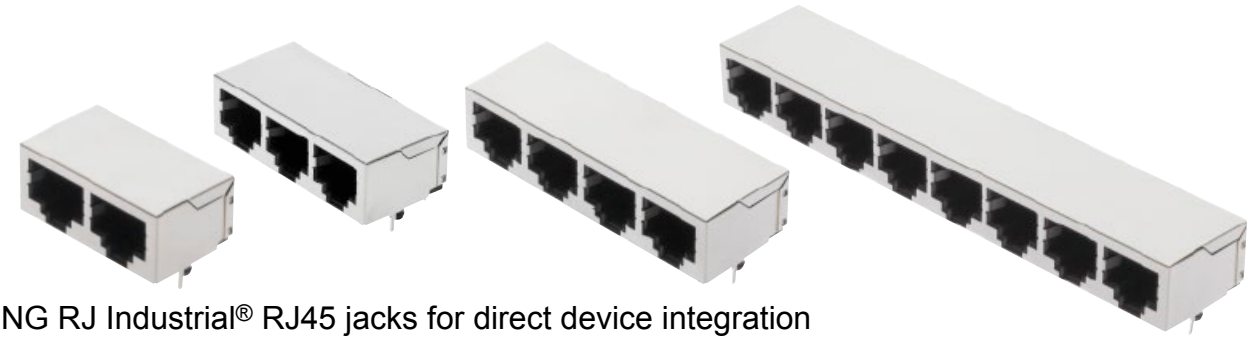


HARTING RJ Industrial® RJ45 jacks for direct device integration

## Advantages

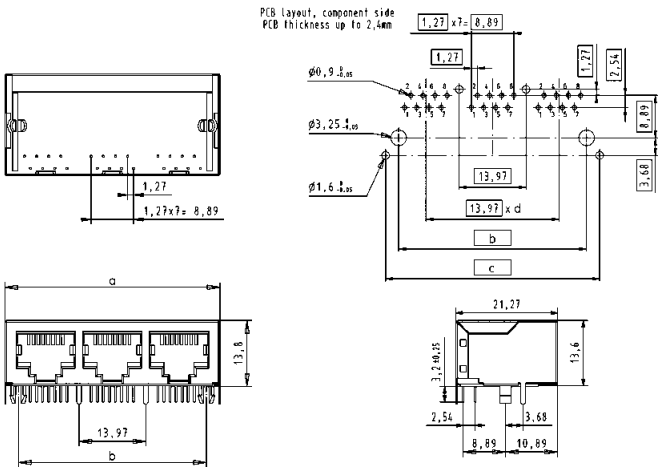
- Compact design
- Category of transmission Cat. 5
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Temperature range -40 °C … +70 °C
- SMC compatible

## Technical characteristics

| | |
|---|---|
| Locking | RJ45 acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Degree of protection | IP20 |
| Rated voltage | 125 V AC |
| Rated current | 1.5 A |
| Mating face | RJ45 acc. to IEC 60603-7 |
| Mating cycles | min. 750 |
| | UL approval |

| Identification | Part number |
|---|---|
| Components device side | |
| RJ45 jack | |
| 2 ports, 90° angled, THT | 09 45 551 1122 |
| 3 ports, 90° angled, THT | 09 45 551 1123 |
| 4 ports, 90° angled, THT | 09 45 551 1124 |
| 6 ports, 90° angled, THT | 09 45 551 1126 |
| 8 ports, 90° angled, THT | 09 45 551 1128 |

Drawing — Dimensions in mm




| | a | b | c | d |
|---|---|---|---|---|
| 2 ports | 31.12 | 25.40 | 30.87 | 1 |
| 3 ports | 45.09 | 39.37 | 44.84 | 2 |
| 4 ports | 59.06 | 53.34 | 58.81 | 3 |
| 6 ports | 87.00 | 81.28 | 86.75 | 5 |
| 8 ports | 114.94 | 109.22 | 114.69 | 7 |



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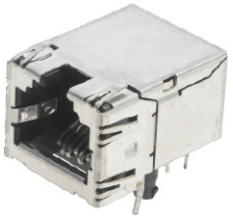


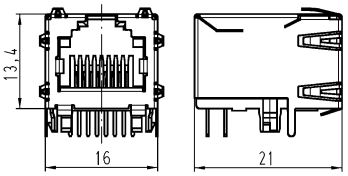
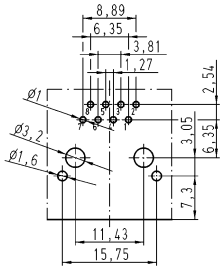
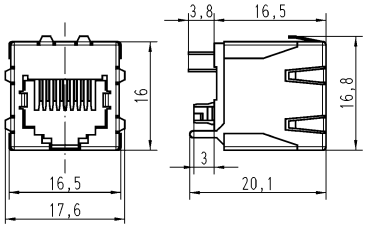
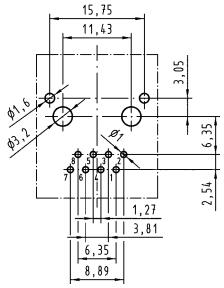
HARTING RJ Industrial® RJ45 jacks for direct device integration

## Advantages

- Compact design
- Category of transmission Cat. 6
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Temperature range -40 °C … +85 °C

## Technical characteristics

| | |
|---|---|
| Locking | RJ45 acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Degree of protection | IP20 |
| Rated voltage | 125 V AC |
| Rated current | 1.5 A |
| Mating face | RJ45 acc. to IEC 60603-7 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +85 °C |
| | UL approval |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | PCB layout, component side |
| **RJ45 jack (Standard)** | | | |
| Solder variant overmoulded (THT), 90° angled | 09 35 002 2101[1] |  |  |
| Solder variant overmoulded (THT), 180° straight | 09 35 002 2102[2] |  |  |

[1] Packaging: Blister à 360 pieces
[2] Packaging: Blister à 400 pieces



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HARTING RJ Industrial® RJ45 jacks for direct device integration

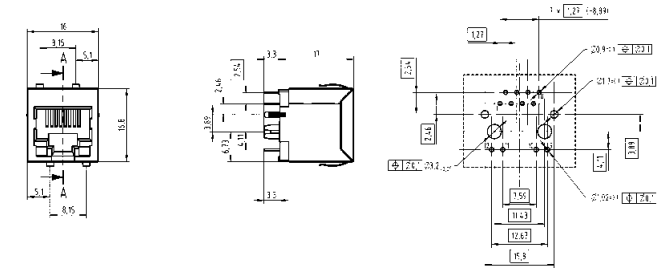
## Advantages

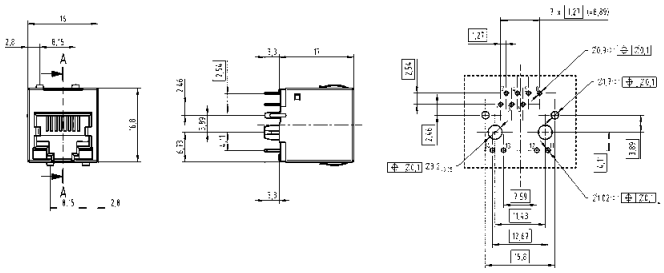
- Compact design
- Excellent EMC behaviour due to integrated transformers and filters for 10/100 Mbit or 1 Gbit Ethernet
- Versions from 10/100 Mbit up to 10 Gbit Ethernet resp. Cat. 5

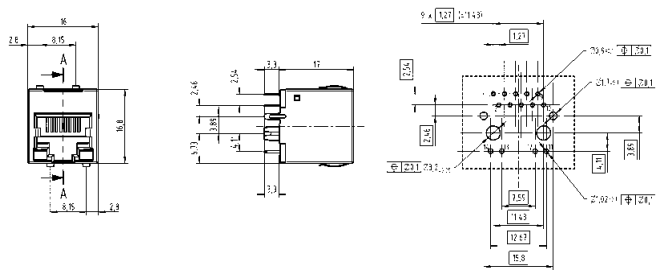
## Technical characteristics

| | |
|---|---|
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Degree of protection | IP20 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +85 °C |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| **RJ45 jack Cat. 5** | | | |
| with bicolour LED | 09 45 551 1119 | | |
| without LED | 09 45 551 1120 | | |
| **RJ45 jack with transformer** | | | |
| 10/100 Mbit with bicolour LED | 09 45 551 1140 | | |
| 10/100 Mbit with LED green/yellow | 09 45 551 1142 | | |
| 1 Gbit with bicolour LED | 09 45 551 1141 | | |
| 1 Gbit with LED green/yellow | 09 45 551 1143 | | |









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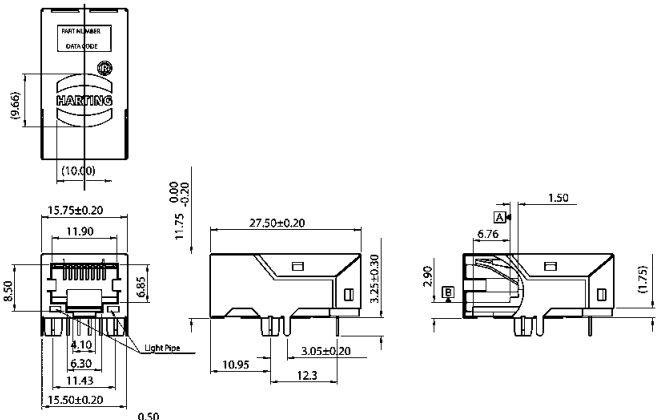
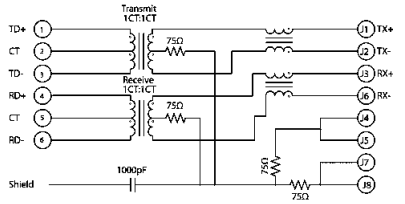
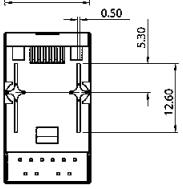
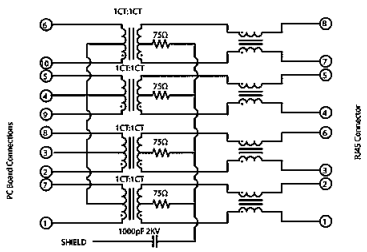
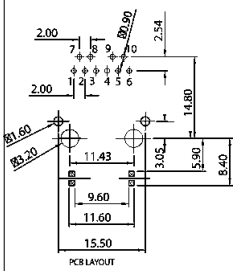
HARTING RJ Industrial® RJ45 jacks with transformer

## Advantages

- Compact design
- Integrated optical fibres
- Excellent EMC behaviour due to integrated transformers and filters for 10/100 Mbit or 1 Gbit Ethernet
- SMC compatible
- Versions from 10/100 Mbit up to 10 Gbit Ethernet and PoE
- Usable for IP65 / IP67 device integration with HARTING PushPull and Han® 3 A RJ45

## Technical characteristics

| | |
|---|---|
| Mating face | RJ45 acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Degree of protection | IP20 |
| Rated voltage | 30 V DC |
| Rated current | 8 mA DC |
| Mating cycles | min. 750 |
| Temperature range | -25 °C … +70 °C |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| RJ45 jack with transformer (low profile) | | | |
| 90° angled, THT<br>10/100 Mbit Ethernet | 09 45 551 1130[1)] |  | |
| Schematic:<br>  | | | |
| 10/100 Mbit Ethernet and PoE | 09 45 551 1131[1)] |  | |
| 90° angled, THT<br>1 Gbit Ethernet | 09 45 551 1530[1)] | | |
| Schematic:<br>  | | | |
| 1 Gbit Ethernet and PoE | 09 45 551 1531[1)] |  | |
| 90° angled, THT<br>10 Gbit Ethernet | 09 45 551 1560[1)] | | |
| | | Customer specific versions on request | |

[1)] Packaging: Blister à 56 pieces



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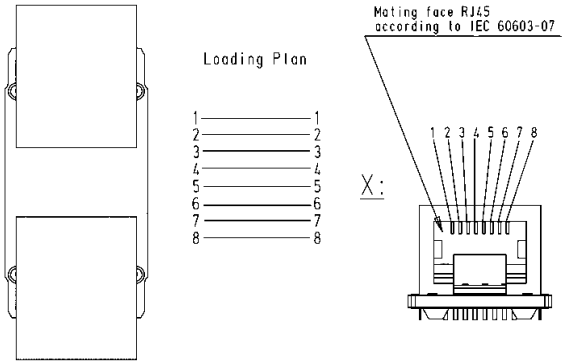
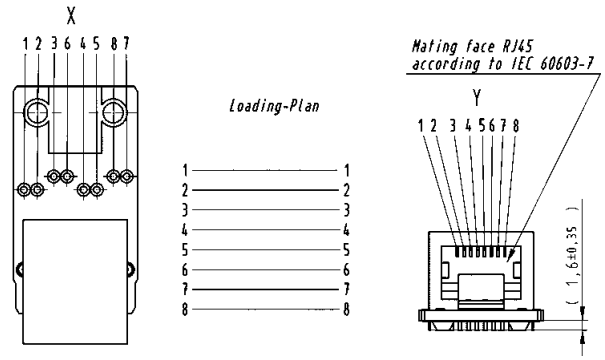
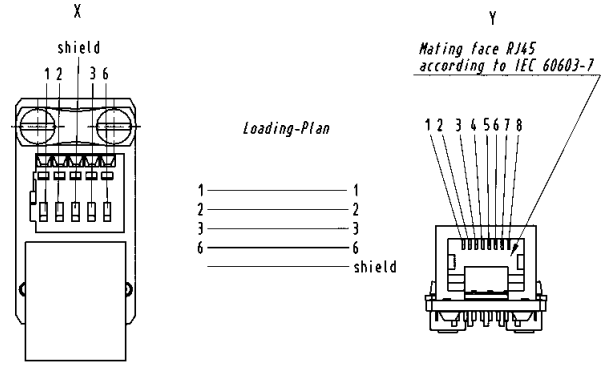
HARTING RJ Industrial® RJ45 – coupler and adapter PCB's

## Advantages

- Compatible with Han® 3 A[1)] and HARTING PushPull
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Temperature range -40 °C … +70 °C

## Technical characteristics

| | |
|---|---|
| Rated voltage | 125 V AC |
| Rated current | 1.5 A |
| Mating face | RJ45 acc. to IEC 60603-7 |
| Mating cycles | min. 750 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Coupler PCB**<br>**2x RJ45 8-poles**<br>2 x RJ45 jack<br>(09 45 551 1102) | 09 45 545 1130 |  | |
| 1 x RJ45 jack horizontal<br>(09 45 551 1102) and<br>1 x RJ45 jack vertical<br>(09 45 551 1103) | 09 45 545 1138 | | |
| **Adapter PCB**<br>**1x RJ45 8-poles**<br>to solder points | 09 45 545 1134 |  | |
| **Adapter PCB**<br>**1x RJ45 8-poles**<br>cage clamp, 5-pole, 1.5 mm² | 09 45 545 1135 |  | |

1) with suitable adapter, see page 04.04



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# HARTING RJ Industrial® 10G

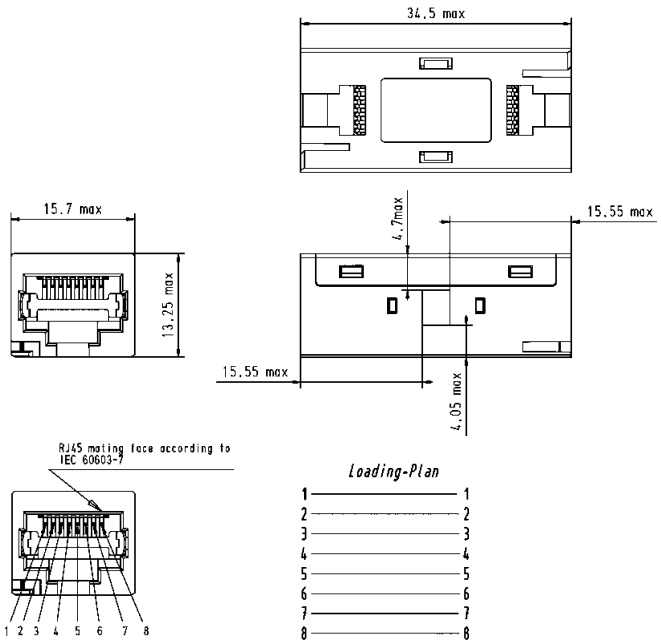
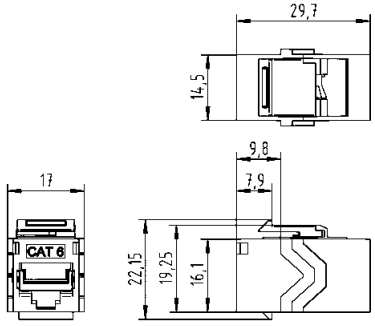
HARTING RJ Industrial® 10G RJ45 bulkhead

## Advantages

- Compact and robust design
- 360° shielding
- Compatible with HIFF dimensions for use in:
  – Han® 3 A series
  – HARTING PushPull (V4)
  – Han® PushPull (V14)
  – *har*-port
  Details see page 01.11
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Mating face | RJ45 acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Transmission category | Cat. 6, performance class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Degree of protection | IP20 |
| Mating cycles | min. 750 |
| Temperature range | –40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® 10G RJ45 bulkhead (HIFF version) | 09 45 545 1560 |  | |
| HARTING RJ Industrial® 10G RJ45 bulkhead (keystone version) | 09 45 545 1568 |  | |





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# HARTING RJ Industrial® 10G

HARTING RJ Industrial® cable jack
(HIFF version)

## Advantages

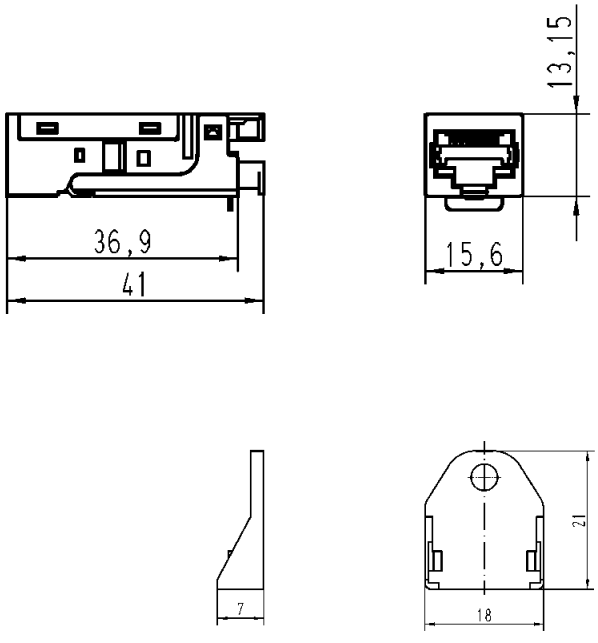
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compatible with HIFF dimensions for use in:
  - Han® 3 A series with HIFF adapter 09 45 515 0024
  - HARTING PushPull (V4)
    - Compact bulkhead mounting housing 09 45 545 0028
    - EasyInstall bulkhead mounting housing 09 45 545 0032
  - Han® PushPull (V14)
    - Panel feed-through plastic 09 35 012 0331
    - Panel feed-through metal rectangular 09 35 012 0311
    - Panel feed-through metal circular 09 35 012 0312
  - *har*-port 09 45 452 0000
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Transmission category | Category 6, class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | Field-assembly |
| Cable termination | with IDC-contacts, without tools |
| Connectable cables | |
| - Conductor cross section | AWG 27 … AWG 24 (solid/stranded)[1] AWG 24 … AWG 22 (solid/stranded)[2] |
| - Conductor diameter | max. 1.6 mm (incl. insulation) |
| - Cable diameter | 5 ... 9 mm |
| Mating cycles | min. 750 |
| Degree of protection | IP20 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number |
|---|---|
| HARTING RJ Industrial® 10G cable jack, 8-poles | |
| AWG 28 … 24 | 09 45 545 1561 |
| AWG 24 … 22 | 09 45 545 1562 |
| HARTING RJ Industrial® PN cable jack, 4-poles, Cat. 5 | |
| AWG 24 … 22 | 09 45 545 1120 |
| Unlocking tool for opening of the HARTING RJ Industrial® cable jacks | 20 82 000 9916 |

Drawing — Dimensions in mm




[1] For part number 09 45 545 1561
[2] For part number 09 45 545 1562 and 09 45 545 1120



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# HARTING RJ Industrial® 10G

HARTING RJ Industrial® cable jack
(keystone version)

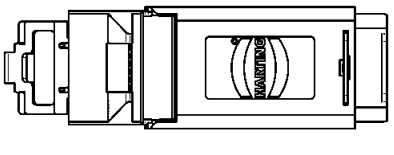
## Advantages

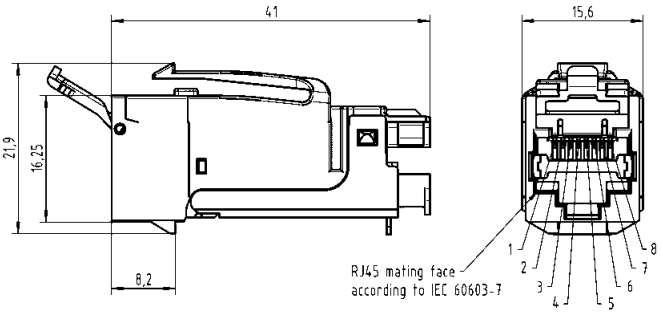
- Compact and robust design
- 360° shielding
- Category of transmission Cat. $6_A$
- Suitable for solid and stranded wires
- Field-assembly with *HARAX*® quick termination in IDC technology
- Keystone form factor – usable for DIN-rail outlet 09 45 851 0000 and a wide range of typical patch panels and wall outlets
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | Field-assembly |
| Cable termination | with IDC-contacts, without tools |
| Connectable cables | |
| - Conductor cross section | AWG 27 … AWG 24 (solid/stranded)[1)]<br>AWG 24 … AWG 22 (solid/stranded)[2)] |
| - Conductor diameter | max. 1.6 mm (incl. insulation)[1)]<br>max. 1.2 mm (incl. insulation)[2)] |
| - Cable diameter | 5 ... 9 mm |
| Mating cycles | min. 750 |
| Degree of protection | IP 20 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® 10G cable jack, 8-poles | | | |
| AWG 28 … 24 | 09 45 545 1563 | | |
| AWG 24 … 22 | 09 45 545 1564 | | |
| HARTING RJ Industrial® PN cable jack, 4-poles, Cat. 5 | | | |
| AWG 24 … 22 | 09 45 545 1122 | | |
| Unlocking tool for opening of the HARTING RJ Industrial® cable jacks | 20 82 000 9916 | | |








[1)] For part number 09 45 545 1564
[2)] For part number 09 45 545 1563 and 09 45 545 1122

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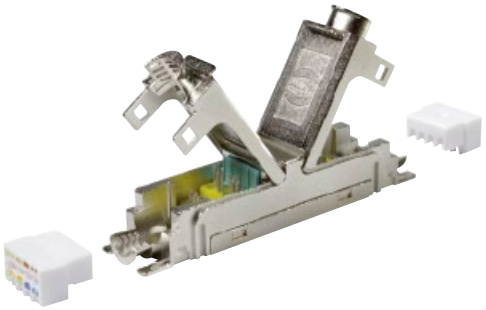
# HARTING RJ Industrial® 10G Extender





HARTING RJ Industrial® 10G Extender

## Advantages

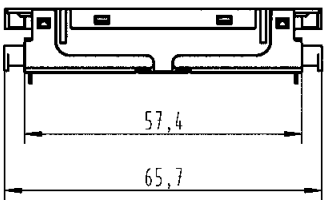
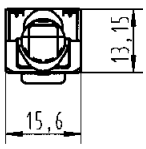
- Simple, fast and reliable connection of data cables
- Compact and robust design
- 360° shielding
- Category of transmission Cat. $6_A$
- Suitable for solid and stranded wires
- Field assembly without special tools

## Application

- Extension of cables for data communication
- Connection of cables with different cross-sections
- Linking of fire compartments

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, Class $E_A$,<br>suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$<br>up to 500 MHz<br>acc. to ISO/IEC 11 801:2002,<br>EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Connectable cables<br>– Conductor cross section<br>– Conductor diameter | <br>AWG 23 … AWG 22<br>(solid and stranded)<br>1.3 … 1.6 mm |
| Cable diameter | 5 … 9 mm |
| Degree of protection | IP20 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial®<br>10G Extender | 09 45 545 1569 |  |  |



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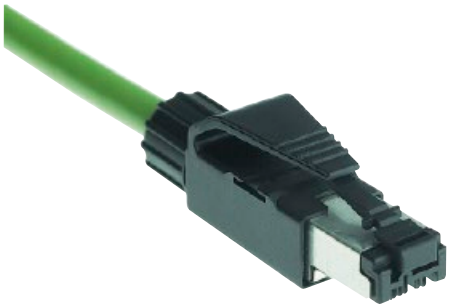
# HARTING RJ Industrial®



HARTING RJ Industrial® connector set RJ45, 4-poles

## Advantages

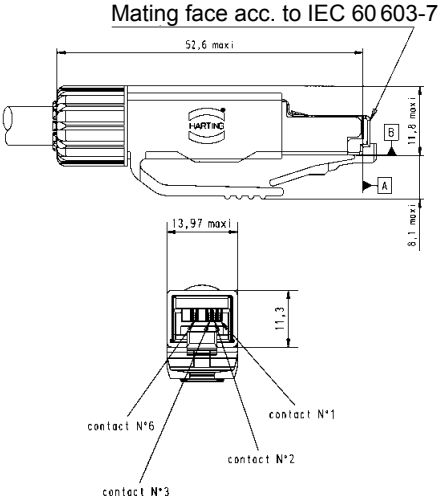
- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Compact design
- Ergonomical unlocking clip
- Less weight assures shock- and vibration-resisting connection
- Category of transmission Cat. 5
- Suitable for termination of solid and stranded cables
- Up to 10 x reconductable
- PROFINET compatible
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60 603-7 |
| Number of contacts | 4 |
| Transmission performance | Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s |
| Mounting | field-assembly |
| Cable termination | with IDC-contacts, without tools |
| Connectable cables | |
| - Conductor cross section | AWG 24/7 … AWG 22/7 (stranded)<br>AWG 23/1 … AWG 22/1 (solid)<br>AWG 26/7 (09 45 151 1109) |
| - Conductor diameter | max. 1.6 mm<br>(09 45 151 1100 / 09 45 151 1108)<br>max. 1.2 mm (09 45 151 1109) |
| - Cable diameter | 6.1 … 6.9 mm |
| Mating cycles | min. 750 |
| Degree of protection | IP20 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Polyamide, UL 94-V0 |
| Colour | black |
| | UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® connector set RJ45, 4-poles | | | |
| incl.:<br>housing with shielding, splicing element, cable gland and instruction manual | 09 45 151 1100<br>09 45 151 1108[1)] | | |
| like 09 45 151 1100 but for AWG 26 | 09 45 151 1109 | | |

Mating face acc. to IEC 60 603-7




[1)] Packaging with 100 sets



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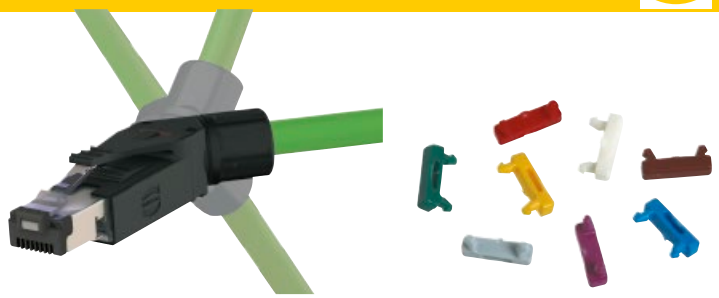


HARTING RJ Industrial® PN connector set RJ45, 4-poles

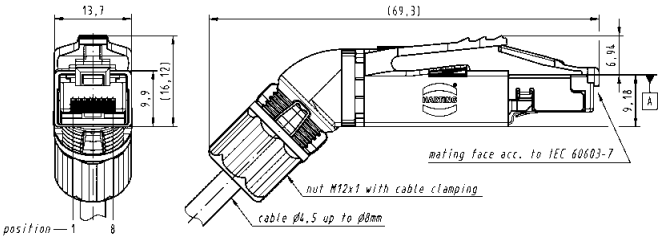
## Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 5
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60603-7 |
| Number of contacts | 4 |
| Transmission category | Category 5, class D |
| Transmission performance | Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1 |
| Transmission rate | 10/100 Mbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | Field-assembly |
| Cable termination | with IDC-contacts, without tools |
| Connectable cables | |
| - Conductor cross section | AWG 27 … AWG 22 (solid / stranded) |
| - Conductor diameter | max. 1.6 mm (incl. insulation) |
| - Cable diameter | 4.5 ... 9 mm (straight version)<br>4.5 up to 8 mm (45° angled version) |
| Mating cycles | min. 750 |
| Degree of protection | IP20 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Polyamide, UL 94-V0 |
| Colour | black |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® PN connector set RJ45, 4-poles | | | |
| straight version | 09 45 151 1120 | | |
| 45° angled version (four different cable outlets possible) | 09 45 151 1121 | | |




| Identification | Colour | Part number |
|---|---|---|
| Colour clips for colour coding the HARTING RJ Industrial® PN connector<br>If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage. | White | 09 45 850 0001 |
| | Grey | 09 45 850 0002 |
| | Yellow | 09 45 850 0003 |
| | Magenta | 09 45 850 0005 |
| | Red | 09 45 850 0007 |
| | Blue | 09 45 850 0008 |
| | Green | 09 45 850 0009 |
| | Brown | 09 45 850 0010 |



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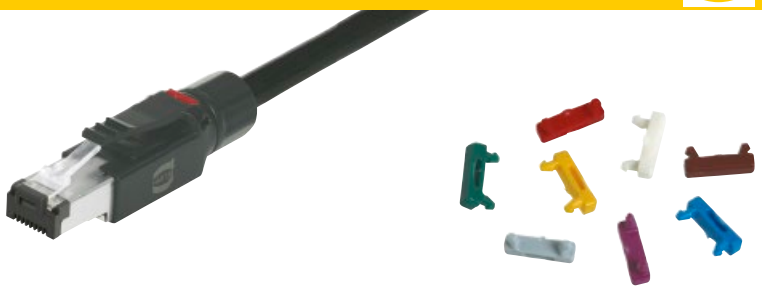


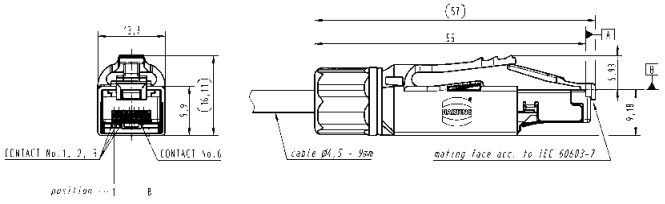
HARTING RJ Industrial® EtherRail® RJ45 connector set, 4-poles

## Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 5
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Optimized version for Ha-VIS EtherRail® Ethernet cable, Shielded Star Quad Cable, AWG 22/19 ultra-flexible, according Cat. 5 cabling standard (ISO/IEC 11 801), part numbers 09 45 600 0188, 09 45 600 0138, 09 45 600 0148 and 09 45 600 0158

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector<br>acc. to IEC 60 603-7 |
| Number of contacts | 4 |
| Transmission category | Category 5, class D |
| Transmission performance | Category 5 / Class D<br>up to 100 MHz acc. to<br>ISO/IEC 11 801:2002,<br>EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s |
| Shielding | fully shielded,<br>360° shielding contact |
| Mounting | Field-assembly |
| Cable termination | with IDC-contacts, without tools |
| Connectable cables | |
| - Conductor cross section | AWG 27 … AWG 22 (solid / stranded) |
| - Conductor diameter | max. 2 mm (incl. insulation) |
| - Cable diameter | 4.5 ... 9 mm |
| Mating cycles | min. 750 |
| Degree of protection | IP20 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Polyamide, UL 94-V0 |
| Colour | black |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® EtherRail® RJ45 connector set, 4-poles | | | |
| straight version | 09 45 151 1122 |  | |

| Identification | Colour | Part number |
|---|---|---|
| Colour clips for colour coding the HARTING RJ Industrial® EtherRail® RJ45 connector<br>If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage. | White | 09 45 850 0001 |
| | Grey | 09 45 850 0002 |
| | Yellow | 09 45 850 0003 |
| | Magenta | 09 45 850 0005 |
| | Red | 09 45 850 0007 |
| | Blue | 09 45 850 0008 |
| | Green | 09 45 850 0009 |
| | Brown | 09 45 850 0010 |



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# HARTING RJ Industrial® PN Compact

HARTING RJ Industrial® PN Compact connector set, 4-poles

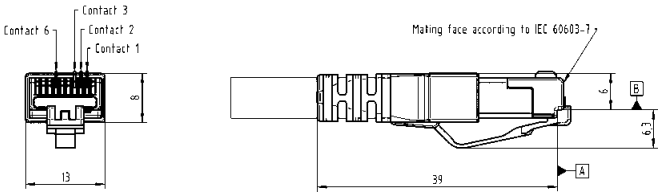
## Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with piercing contacts
- Compact design
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 5
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60 603-7 |
| Number of contacts | 4 |
| Transmission performance | Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | Field-assembly |
| Cable termination | with piercing contacts |
| Connectable cables | |
| - Conductor cross section | AWG 24/7 … AWG 22/7 (stranded) |
| - Conductor diameter | max. 1.6 mm (incl. insulation) |
| - Cable diameter | 4.5 ... 7.5 mm |
| Mating cycles | min. 750 |
| Degree of protection | IP20 |
| Temperature range | -40 °C … +70 °C |
| Housing material | PA, UL 94-V0 |
| Colour | green |
| | UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® PN Compact connector set, 4-poles | | | |
| Compact version | 09 45 151 1130[1)] | | |
| Assembly tool | 09 45 800 0530 | | |




1) Packaging with 100 sets



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# HARTING RJ Industrial® Gigalink, 8-poles

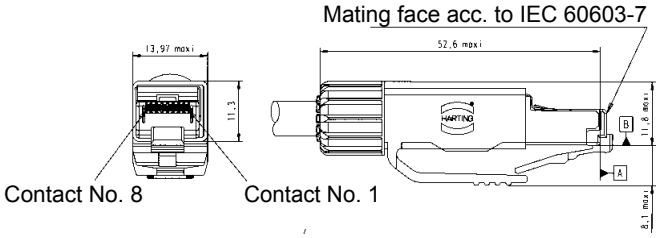
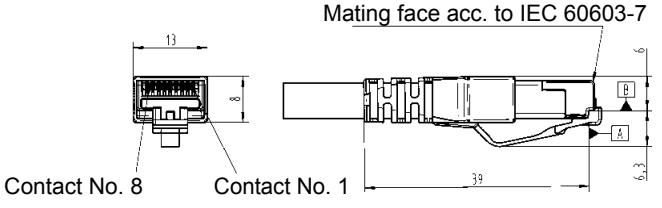
HARTING RJ Industrial® connector set RJ45, 8-poles

## Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with piercing contacts
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. $6_A$
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | Field-assembly |
| Cable termination | with piercing contacts |
| Connectable cables | |
| - Conductor cross section | AWG 28/7 … AWG 24/7 (stranded) |
| - Conductor diameter | max. 1.05 mm (incl. insulation) |
| - Cable diameter | 6.1 ... 6.9 mm |
| Mating cycles | min. 750 |
| Degree of protection | IP20 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Polycarbonate, UL 94-V0 |
| Colour | black |
| | UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® connector set RJ45, 8-poles<br>incl.:<br>housing with shielding, cable gland and instruction manual | 09 45 151 1520<br>09 45 151 1520 XL[1)] |  | |
| Assembly tool for 09 45 151 1520 | 09 45 800 0520 | | |
| Compact version | 09 45 151 1525[1)] |  | |
| Assembly tool for 09 45 151 1525 | 09 45 800 0025 | | |

[1)] Packaging with 100 sets



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# HARTING RJ Industrial® 10G

HARTING RJ Industrial® 10G connector set RJ45, 8-poles

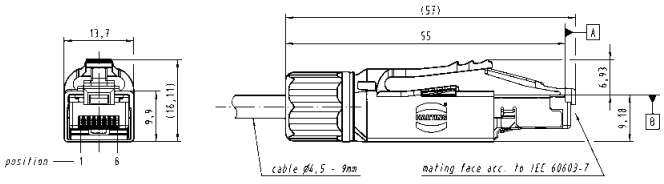
## Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Transmission category | Category 6, class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | Field-assembly |
| Cable termination | with IDC-contacts, without tools |
| Connectable cables | |
| - Conductor cross section | AWG 27 … AWG 22 (solid / stranded) |
| - Conductor diameter | max. 1.6 mm (incl. insulation) |
| - Cable diameter | 4.5 ... 9 mm (straight version)<br>4.5 up to 8 mm (45° angled version) |
| Mating cycles | min. 750 |
| Degree of protection | IP20 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Polyamide, UL 94-V0 |
| Colour | black |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® 10G connector set RJ45, 8-poles | | | |
| straight version | 09 45 151 1560<br>09 45 151 1560 XL[1)] | | |
| 45° angled version (four different cable outlets possible) | 09 45 151 1561 | | |




| Identification | Colour | Part number |
|---|---|---|
| Colour clips for colour coding the HARTING RJ Industrial® 10G connector<br>If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage. | White | 09 45 850 0001 |
| | Grey | 09 45 850 0002 |
| | Yellow | 09 45 850 0003 |
| | Magenta | 09 45 850 0005 |
| | Red | 09 45 850 0007 |
| | Blue | 09 45 850 0008 |
| | Green | 09 45 850 0009 |
| | Brown | 09 45 850 0010 |

[1)] Packaging with 100 sets



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| Identification | Part number | |
|---|---|---|
| HARTING RJ Industrial® Stripping Tool<br>Stripping tool for Ethernet cables including blade cassette<br>Spare blade cassette | 09 45 800 0000<br>09 45 800 0001 | <br>The RJ Industrial Stripping Tool is ready to remove insulation from cables for fast mounting with diameters from 2.5 to 8 mm quick and easy. It allows to remove cable sheath and shielding braid in one. |
| Stripping tool | 09 45 800 0002 | |
| HARTING RJ Industrial® Gigalink Mounting tools<br>for HARTING RJ Industrial® Gigalink connectors<br>for HARTING RJ Industrial® Gigalink Cat. $6_A$ compact connectors | 09 45 800 0520<br>09 45 800 0025 | <br> <br>With the RJ Industrial Gigalink Assembly Tool Ethernet connectors can be quickly, easily and reliably connected to flexible cables. |
| Wire cutter | 09 45 800 0005 | |
| Cable shear | 09 45 800 0004 | |



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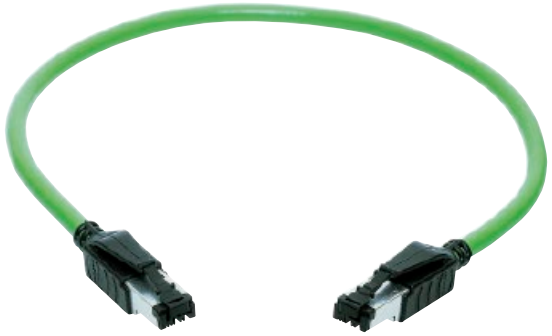

## HARTING RJ Industrial® system cable RJ45, 4-wire, IP20

RJ45 patch cords for switch cabinet or PLC

| Description | Part number Standard | Part number Multiport | Technical characteristics |
|---|---|---|---|
| For the cabling of Industrial Ethernet networks (for example in accordance with the PROFINET guideline), based on RJ45 connectors.<br><br>Wiring:<br>Contacts RJ45 1/2 and 3/6 | | | Transmission properties in accordance with ISO/IEC 11 801:2002: Class D<br>Mating face: 2 x RJ45 in acc. with IEC 60 603-7<br>Protection level: IP20 (if mated)<br>Temperature range -40 °C … +70 °C<br><br>**Electrical characteristics at 20 °C**<br>Contact resistance: ≤ 20 mΩ<br>Insulation resistance: ≥ 500 MΩ<br>Dielectric withstanding voltage:<br>contact - contact 1 kV<br>contact - ground 1.5 kV<br><br>**Electrical characteristics after damp heat cycles**<br>Contact resistance: ≤ 20 mΩ<br>Insulation resistance: ≥ 100 MΩ<br>Dielectric withstanding voltage:<br>contact - contact 1 kV<br>contact - ground 1.5 kV |
| HARTING RJ Industrial® system cable RJ45, 4-wire<br>Type A<br> | | | Cable type: Industrial Ethernet Standard Cable, 2 x 2 x AWG 22/1, double shielding (PROFINET Typ A)<br>Sheath: PVC green, Ø 6.5 mm<br>Connectors: 2 x HARTING RJ Industrial® IP20 Data with overmolded housings |
| Length 1.5 m | 09 45 771 0023 | 09 47 343 4006 | |
| Length 3.0 m | 09 45 771 0025 | 09 47 343 4009 | |
| Length 5.0 m | 09 45 771 0027 | 09 47 343 4012 | |
| Length 10.0 m | 09 45 771 0051 | 09 47 343 4018 | |
| Length 20.0 m | 09 45 771 0053 | 09 47 343 4020 | |
| HARTING RJ Industrial® system cable RJ45, 4-wire<br>Type B<br> | | | Cable type: Industrial Ethernet Stranded Cable, 2 x 2 x AWG 22/7, double shielding (PROFINET Typ B)<br>Sheath: PVC green, Ø 6.5 mm<br>Connectors: 2 x HARTING RJ Industrial® IP20 Data with overmolded housings |
| Length 1.5 m | 09 45 771 1123 | 09 47 343 4034 | |
| Length 3.0 m | 09 45 771 1125 | 09 47 343 4037 | |
| Length 5.0 m | 09 45 771 1127 | 09 47 343 4040 | |
| Length 10.0 m | 09 45 771 1151 | 09 47 343 4046 | |
| Length 20.0 m | 09 45 771 1153 | 09 47 343 4048 | |
| HARTING RJ Industrial® system cable RJ45, 4-wire<br>Type C<br> | | | Cable type: Industrial Ethernet Trailing Cable, 2 x 2 x AWG 22/7, double shielding (PROFINET Typ C)<br>Sheath: PUR green, Ø 6.5 mm<br>Connectors: 2 x HARTING RJ Industrial® IP20 Data with overmolded housings |
| Length 1.5 m | 09 45 771 1164 | 09 47 343 4090 | |
| Length 3.0 m | 09 45 771 1166 | 09 47 343 4093 | |
| Length 5.0 m | 09 45 771 1168 | 09 47 343 4096 | |
| Length 10.0 m | 09 45 771 1173 | 09 47 343 4102 | |
| Length 20.0 m | 09 45 771 1175 | 09 47 343 4104 | |

Further system cables see HARTING-catalogue “Intelligent Network Solutions”



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Exit left

Exit right

Exit top

Exit bottom

## HARTING RJ Industrial® system cable RJ45 angled, 4-wire, IP20

RJ45 connection cable, first end angled, second side open, for control or distributor cabinets or within controllers

| Identification | | Part number angled left | angled right | angled top | angled bottom |
|---|---|---|---|---|---|
| **HARTING RJ Industrial® System cable RJ45 angled, 4-wire**<br>one side pre-assembled, second side open<br>Cable type A, green 2 x 2 x AWG 22/1 | Length 0.5 m | 09 47 050 0001 | 09 47 060 0001 | 09 47 030 0001 | 09 47 040 0001 |
| | Length 1.0 m | 09 47 050 0002 | 09 47 060 0002 | 09 47 030 0002 | 09 47 040 0002 |
| | Length 1.5 m | 09 47 050 0003 | 09 47 060 0003 | 09 47 030 0003 | 09 47 040 0003 |
| | Length 2.0 m | 09 47 050 0004 | 09 47 060 0004 | 09 47 030 0004 | 09 47 040 0004 |
| | Length 3.0 m | 09 47 050 0005 | 09 47 060 0005 | 09 47 030 0005 | 09 47 040 0005 |
| | Length 5.0 m | 09 47 050 0007 | 09 47 060 0007 | 09 47 030 0007 | 09 47 040 0007 |
| **HARTING RJ Industrial® System cable RJ45 angled, 4-wire**<br>one side pre-assembled, second side open<br>Cable type B, green 2 x 2 x AWG 22/7 | Length 0.5 m | 09 47 050 0023 | 09 47 060 0023 | 09 47 030 0023 | 09 47 040 0023 |
| | Length 1.0 m | 09 47 050 0024 | 09 47 060 0024 | 09 47 030 0024 | 09 47 040 0024 |
| | Length 1.5 m | 09 47 050 0025 | 09 47 060 0025 | 09 47 030 0025 | 09 47 040 0025 |
| | Length 2.0 m | 09 47 050 0026 | 09 47 060 0026 | 09 47 030 0026 | 09 47 040 0026 |
| | Length 3.0 m | 09 47 050 0027 | 09 47 060 0027 | 09 47 030 0027 | 09 47 040 0027 |
| | Length 5.0 m | 09 47 050 0029 | 09 47 060 0029 | 09 47 030 0029 | 09 47 040 0029 |
| **HARTING RJ Industrial® System cable RJ45 angled, 4-wire**<br>one side pre-assembled, second side open<br>Cable type C, green 2 x 2 x AWG 22/7 | Length 0.5 m | 09 47 050 0045 | 09 47 060 0045 | 09 47 030 0045 | 09 47 040 0045 |
| | Length 1.0 m | 09 47 050 0046 | 09 47 060 0046 | 09 47 030 0046 | 09 47 040 0046 |
| | Length 1.5 m | 09 47 050 0047 | 09 47 060 0047 | 09 47 030 0047 | 09 47 040 0047 |
| | Length 2.0 m | 09 47 050 0048 | 09 47 060 0048 | 09 47 030 0048 | 09 47 040 0048 |
| | Length 3.0 m | 09 47 050 0049 | 09 47 060 0049 | 09 47 030 0049 | 09 47 040 0049 |
| | Length 5.0 m | 09 47 050 0051 | 09 47 060 0051 | 09 47 030 0051 | 09 47 040 0051 |
| **HARTING RJ Industrial® System cable RJ45 angled, 4-wire**<br>one side pre-assembled, second side open<br>Outdoor cable, black 2 x 2 x AWG 22/7 | Length 0.5 m | 09 47 050 0067 | 09 47 060 0067 | 09 47 030 0067 | 09 47 040 0067 |
| | Length 1.0 m | 09 47 050 0068 | 09 47 060 0068 | 09 47 030 0068 | 09 47 040 0068 |
| | Length 1.5 m | 09 47 050 0069 | 09 47 060 0069 | 09 47 030 0069 | 09 47 040 0069 |
| | Length 2.0 m | 09 47 050 0070 | 09 47 060 0070 | 09 47 030 0070 | 09 47 040 0070 |
| | Length 3.0 m | 09 47 050 0071 | 09 47 060 0071 | 09 47 030 0071 | 09 47 040 0071 |
| | Length 5.0 m | 09 47 050 0073 | 09 47 060 0073 | 09 47 030 0073 | 09 47 040 0073 |



Further system cables see HARTING-catalogue “Intelligent Network Solutions”

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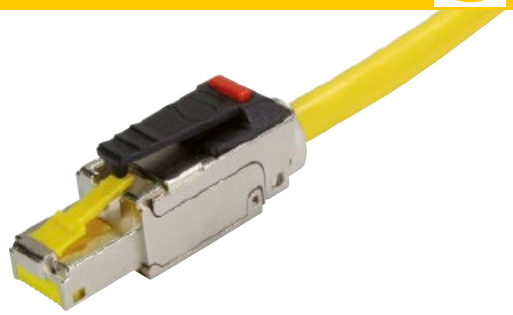


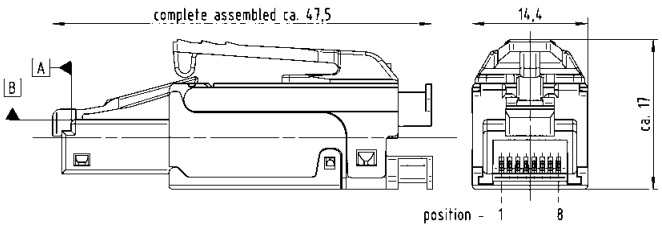
Ha-VIS preLink® RJ45 connector

## Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Compact and robust design
- 360° shielding
- Ergonomically unlocking clip
- Category of transmission Cat. $6_A$
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, Class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Cable termination for preLink® terminal module, yellow, 20 82 000 0001 | |
| Connectable cables | |
| – Conductor cross section | AWG 23 … AWG 22 (solid and stranded) |
| – Conductor diameter | 1.3 … 1.6 mm |
| Cable termination for preLink® terminal module, white, 20 82 000 0003 | |
| Connectable cables | |
| – Conductor cross section | AWG 27 … AWG 26 (solid and stranded) |
| – Conductor diameter | 0.8 … 1.1 mm |
| Cable diameter | 5 … 9 mm |
| Degree of protection | IP20 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Ha-VIS preLink® RJ45 connector | 20 82 101 0010 |  | |
| Ha-VIS preLink® RJ45 terminal module | | | |
| AWG 22/23, yellow[1)] | 20 82 000 0001 | | |
| AWG 26/27, white[1)] | 20 82 000 0003 | | |
| Ha-VIS preLink® assembly tool | 20 82 000 9901 | | |



| Identification | Colour | Part number |
|---|---|---|
| Colour clips for colour coding the Ha-VIS preLink® connectors | White | 09 45 850 0001 |
| | Grey | 09 45 850 0002 |
| | Yellow | 09 45 850 0003 |
| | Magenta | 09 45 850 0005 |
| | Red | 09 45 850 0007 |
| | Blue | 09 45 850 0008 |
| | Green | 09 45 850 0009 |
| | Brown | 09 45 850 0010 |

[1)] Packaging with 10 pieces



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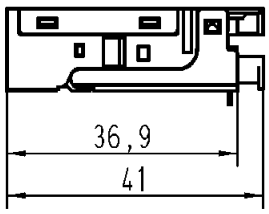
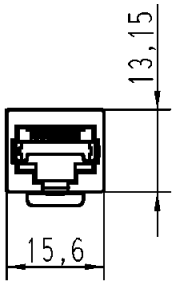
## Ha-VIS preLink® RJ45 jacks (HIFF)

## Advantages

- Compact and robust design
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Compatible with HIFF dimensions for use in:
  - Han® 3 A series with HIFF adapter 09 45 515 0024
  - HARTING PushPull (V4)
    - Compact bulkhead mounting housing 09 45 545 0028
    - EasyInstall bulkhead mounting housing 09 45 545 0032
  - Han® PushPull (V14)
    - Panel feed-through plastic 09 35 012 0331
    - Panel feed-through metal rectangular 09 35 012 0311
    - Panel feed-through metal circular 09 35 012 0312
  - *har*-port 09 45 452 0000
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, Class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Cable termination for preLink® terminal module, yellow, 20 82 000 0001 | |
| Connectable cables | |
| – Conductor cross section | AWG 23 … AWG 22 (solid and stranded) |
| – Conductor diameter | 1.3 … 1.6 mm |
| Cable termination for preLink® terminal module, white, 20 82 000 0003 | |
| Connectable cables | |
| – Conductor cross section | AWG 27 … AWG 26 (solid and stranded) |
| – Conductor diameter | 0.8 … 1.1 mm |
| Cable diameter | 5 … 9 mm |
| Degree of protection | IP20 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Ha-VIS preLink® set RJ45 jack<br>consists of:<br>• 1x RJ45 module<br>• 1x terminal module<br>• 1x cable tie | AWG 22/23<br>AWG 26/27 | 20 82 001 0001<br>20 82 001 0002 |  |  |
| Ha-VIS preLink® RJ45 jack module | | 20 82 000 0002 | | |
| Ha-VIS preLink® RJ45 terminal module | AWG 22/23, yellow[1)]<br>AWG 26/27, white[1)] | 20 82 000 0001<br>20 82 000 0003 | | |
| Ha-VIS preLink® protection cover | | 20 82 000 9915 | | |
| Ha-VIS preLink® unlocking tool | | 20 82 000 9916 | | |
| Ha-VIS preLink® assembly tool | | 20 82 000 9901 | | |

[1)] Packaging with 10 pieces



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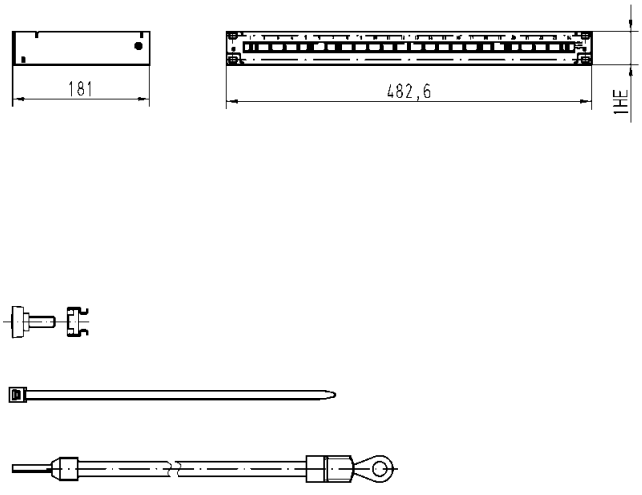
## Ha-VIS preLink®
## 19“ Patch panel, HIFF

## Advantages

- Flexible, suitable for Ha-VIS preLink® modules RJ45 jack and HARTING RJ Industrial® modules in HIFF size
- Economical, time-saving installation due to the slidable module carrier, frontward and backward removal
- Safety, additional strain-relief
- Fully shielded modules connected by module carrier
- Earth bolt
- IP20 installation for distributors and switch cabinets

## Technical characteristics

| | |
|---|---|
| Number of modules | 24 |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | up to 10 Gbit/s |
| Assembly | in 19“ racks acc. to IEC/DIN EN 60 297-3-100 (DIN 41 494-1) |
| Dimensions (W x H x D) | 482.6 mm (19“) x 44.5 mm (1 U) x 181 mm |
| Degree of protection | IP20 |
| Operating temperature range | -40 °C … +70 °C |
| Material | |
| module carrier, 2-parts | steel sheet |
| front cover | stainless steel |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Ha-VIS preLink®<br>19“ patch panel, unloaded<br><br>Suitable modules:<br>• Ha-VIS preLink® RJ45 jack, HIFF<br>• mixed loading possible<br><br>Range of delivery::<br>• Screw set M5<br>• 24 cable ties<br>• 1x earth conductor 6 mm² | 20 82 400 0001 |  | |



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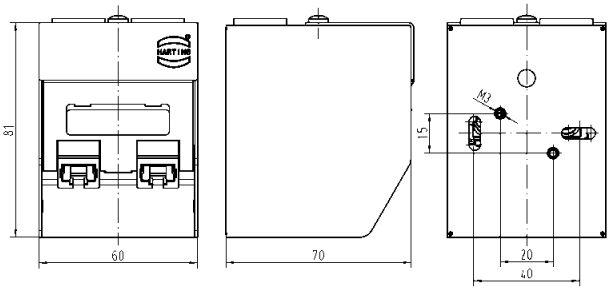
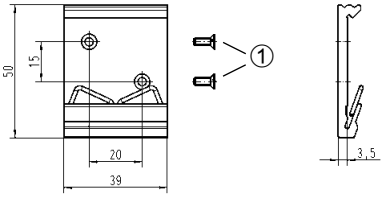
## Ha-VIS preLink®
## HIFF RJ45 AP Box

## Advantages

- Flexible, suitable for on-wall mounting or for top-hat mounting rail (35 mm)
- Economical, time-saving installation due to the use of pre-assembled data cables with Ha-VIS preLink® termination
- Robust design, powder-coated steel plate housing
- Structured cabling for industrial premises

## Technical characteristics

| | |
|---|---|
| Number of ports, Copper / Termination | 2 / RJ45 jack HIFF |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | up to 10 Gbit/s |
| Shielding | Fully shielded, 360° shielding contact |
| Cable diameter | 5 mm ... 9 mm |
| Mounting | on-wall or DIN Rail |
| Dimensions (WxHxD) | 60 x 81 x 70 mm |
| Degree of protection | IP20 |
| Operating temperature | -40 °C … +70 °C |
| Housing material | steel plate |
| Colour | Anthracite grey (RAL 7016) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Ha-VIS preLink® HIFF RJ45 AP Box<br>RJ45 wall-mounted box consisting of:<br>• 1x steel-plate housing, 2-parts<br>• 2x Ha-VIS preLink® Set, RJ45 jack HIFF, AWG 22/23<br>• 2x grommet with membrane<br>• 1x assembly instruction | 20 82 101 0220 |  | |
| Accessory<br>DIN Rail mounting bracket | 20 80 000 0003 |  | |



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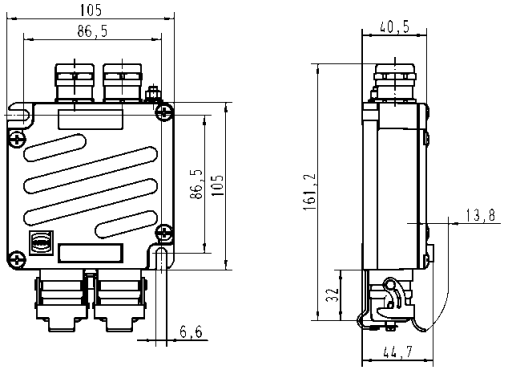
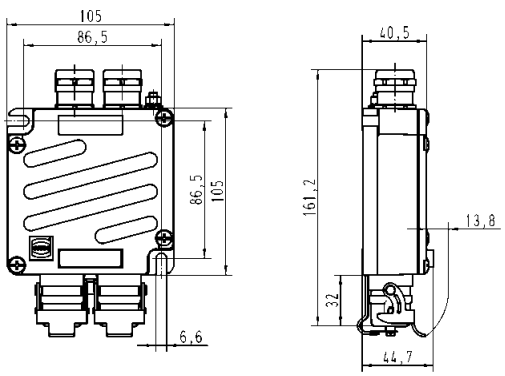
Ha-VIS preLink®
Han® PushPull Metal Outlet
and Han® 3 A Metal Outlet

## Advantages

- Simple mounting, fixing and earth connection both outside
- Fast termination of data cables due to Ha-VIS preLink® technology
- Structured cabling for industrial premises
- Mating face AIDA compliant, protection cover incl.
- PROFINET compatible

## Technical characteristics

| | |
|---|---|
| Number of ports, Copper / Termination | 2 x Han® PushPull RJ45 (IP65 / IP67) or Han® 3 A RJ45 |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | up to 10 Gbit/s |
| Termination | Ha-VIS preLink® |
| Wire gauge | AWG 24 ... 22 (0.25 mm² ... 0.34 mm²) solid and stranded |
| Strand diameter | Ø 1.3 mm ... 1.6 mm |
| Cable diameter | 7.2 mm ... 8 mm |
| Shielding | Fully shielded 360° flexible shielding termination |
| Mounting | Wall mounting |
| Dimensions (H x W x D) | 105 x 105 x 40.5 mm |
| Degree of protection | IP65 / IP67 |
| Operating temperature range | -40 °C … +70 °C |
| Housing material | Aluminium, die-cast |
| Colour | Black |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Ha-VIS preLink®<br>Han® PushPull Metal Outlet<br><br>consists of:<br>• 1x Housing including protection covers<br>• 2x Ha-VIS preLink® Set RJ45 jack AWG 22/23<br>• 2x Cable gland with slotted seal<br>• 1x Assembly instruction | 20 82 104 0101 |  | |
| Ha-VIS preLink®<br>Han® 3 A Metal Outlet<br><br>consists of:<br>• 1x Housing including protection covers<br>• 2x Ha-VIS preLink® Set RJ45 jack AWG 22/23<br>• 2x Cable gland with slotted seal<br>• 1x Assembly instruction | 20 82 102 0101 |  | |



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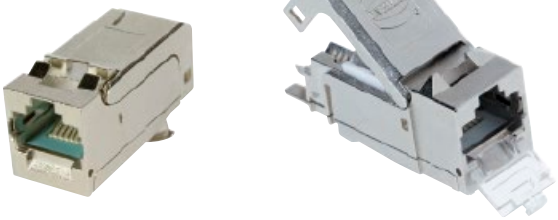
PROFINET INDUSTRIAL ETHERNET



## Ha-VIS preLink® RJ45 jack (keystone version)

## Advantages

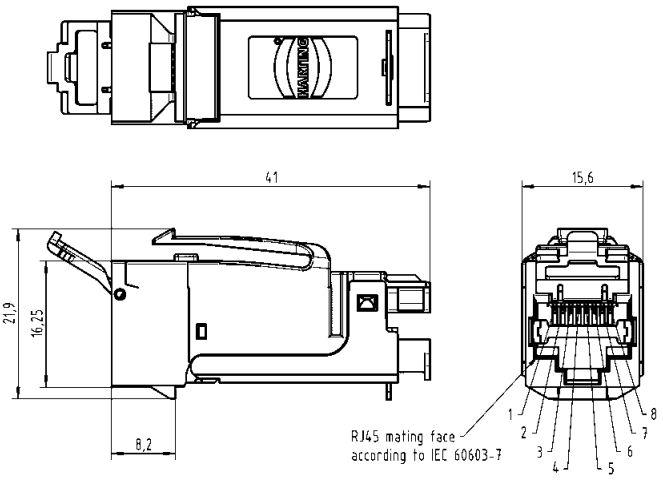
- RJ45 Ethernet-Data jack suitable for industry
- Compact and robust design
- 360° shielding
- Ergonomically unlocking clip
- Category of transmission Cat. $6_A$
- Suitable for solid and stranded wires
- Compatible with keystone panel cut out acc. to IEC 60 603-7
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, Class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Cable termination for preLink® terminal module, yellow, 20 82 000 0001 | |
| Connectable cables | |
| – Conductor cross section | AWG 23 … AWG 22 (solid and stranded) |
| – Conductor diameter | 1.3 … 1.6 mm |
| Cable termination for preLink® terminal module, white, 20 82 000 0003 | |
| Connectable cables | |
| – Conductor cross section | AWG 27 … AWG 26 (solid and stranded) |
| – Conductor diameter | 0.8 … 1.1 mm |
| Cable diameter | 5 … 9 mm |
| Degree of protection | IP20 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | | Part number |
|---|---|---|
| Ha-VIS preLink® set RJ45 keystone jack<br>consists of:<br>• 1x RJ45 module<br>• 1x terminal module<br>• 1x cable tie | AWG 22/23 | 20 82 501 0001 |
| Ha-VIS preLink® RJ45 keystone jack module | | 20 82 500 0001 |
| Ha-VIS preLink® RJ45 angled keystone jack module | | 20 82 500 0002[2] |
| Ha-VIS preLink® RJ45 terminal module | AWG 22/23, yellow[1] | 20 82 000 0001 |
| | AWG 26/27, white[1] | 20 82 000 0003 |
| Ha-VIS preLink® protection cover | | 20 82 000 9915 |
| Ha-VIS preLink® unlocking tool | | 20 82 000 9916 |
| Ha-VIS preLink® assembly tool | | 20 82 000 9901 |

Drawing — Dimensions in mm




[1] Packaging with 10 pieces
[2] Packaging with 24 pieces



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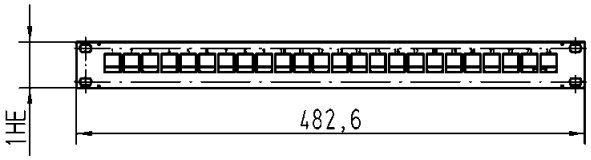
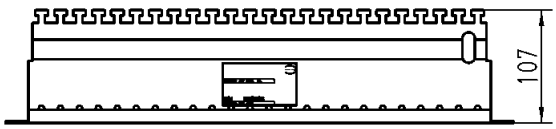
Ha-VIS preLink®
19“ Patch panel, keystone

## Advantages

- Suitable for Ha-VIS preLink® RJ45 module in keystone size
  - Economic due to easy design
  - Safety, additional strain-relief
  - Fully shielded modules connected through metal holding fixture
  - Earth bolt

## Technical characteristics

| | |
|---|---|
| Number of modules | 24 |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | up to 10 Gbit/s |
| Module design | Keystone size acc. to EN 60 603-7:2009 |
| Assembly | in 19“ racks acc. to IEC/DIN EN 60 297-3-100 (DIN 41 494-1) |
| Dimensions (W x H x D) | 482.6 mm (19“) x 44.5 mm (1 U) x 107 mm |
| Degree of protection | IP20 |
| Operating temperature range | -40 °C … +70 °C |
| Material | steel sheet |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Ha-VIS preLink®<br>19“ patch panel, keystone | 20 82 405 0001 |  | |
| Range of delivery:<br>24 pieces of:<br>• Ha-VIS preLink® RJ45 keystone jack<br>• terminal modules for AWG 22 / 23<br>• strain relief | |  | |
| Ha-VIS preLink®<br>19“ patch panel, keystone empty | 20 82 400 0002 | | |



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## HARTING Cabinet Outlet RJ45, 8-poles

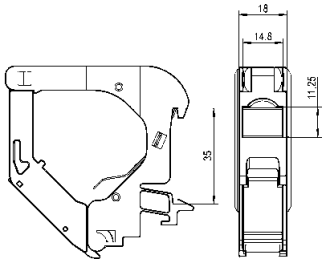
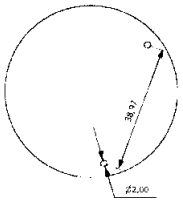
RJ45 distribution module for IP20 environments
(top-hat rail mounting)

## Advantages

- Simple mountng
- Dust protection caps
- Port identification
- Angled output

## Technical characteristics

| | |
|---|---|
| Number of ports, Copper / Termination | 1 / RJ45 (Twisted Pair) |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 250 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Mounting | To 35 mm top-hat mounting rail acc. to DIN EN 60 715, alignable |
| Dimensions (H x W x D) | 71 x 18 x 68 mm |
| Degree of protection | IP20 |
| Operating temperature range | –20 °C … +70 °C |
| Housing material | Polyamide, UL94 V-0 |
| Colour | Grey |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING RJ Industrial® Cabinet Outlet RJ45 | 09 45 851 0000 |  |  |
| Protection cover set for 09 45 851 0000 | 09 45 851 0001 | | |
| Usable RJ45 cable jacks | | | |
| • Ha-VIS preLink® keystone set AWG 22/23 (with Ha-VIS preLink® terminal block) | 20 82 501 0001 | | |
| • Ha-VIS preLink® keystone set (without Ha-VIS preLink® terminal block) | 20 82 500 0001 | | |
| Usable with Ha-VIS preLink® terminal blocks | | | |
| • Ha-VIS preLink® terminal block AWG 22/23 (24) | 20 82 000 0001 | | |
| • Ha-VIS preLink® terminal block AWG 26/27 | 20 82 500 0003 | | |
| Usable RJ45 cable jacks | | | |
| • RJ45 keystone module IDC AWG 24 – AWG 22 | 09 45 545 1564 | | |
| • RJ45 keystone module IDC AWG 27 – AWG 26 | 09 45 545 1563 | | |



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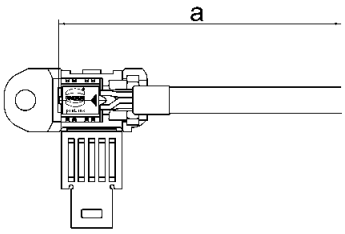
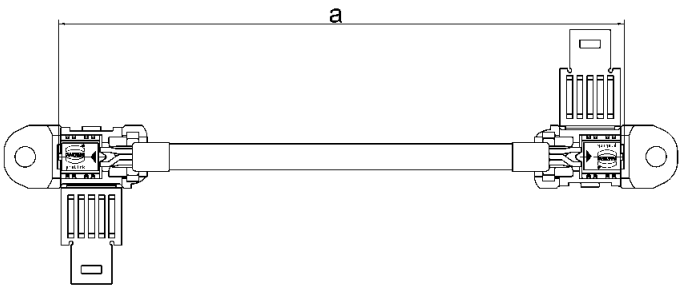
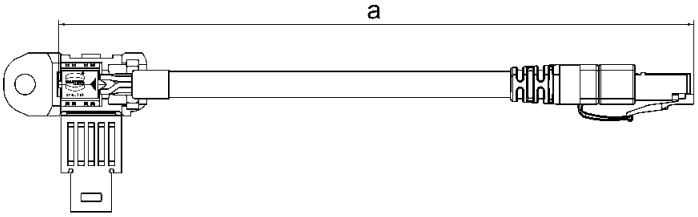
Ha-VIS preLink® Patch cables

## Advantages

- Pre-assembled system cable, fast, flexible and reliable in the application
- Simple in handling
- Robust in design
- Installation of Ha-VIS preLink® cables for industrial environment
- Connection cable for control or distributor cabinets or within controllers

## Technical characteristics

| | |
|---|---|
| Cable types | 4 x 2 AWG 27/7, shielded, S/FTP Cat. 7 |
| Sheath material | PUR |
| Wiring | TIA/EIA 568B, 1:1 |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | up to 10 Gbit/s |
| Shielding | Copper braid, tinned |
| Operating temperature range<br>fixed operation<br>flexible operation | <br>-35 °C … +70 °C<br>-5 °C ... +50 °C |
| Standard lengths | 0.6 m / 1 m / 2 m / 3 m / 5 m / 10 m<br>other lengths available on request |
| Colour | Yellow |

| Identification | | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|---|
| **Ha-VIS preLink® Patch cable** | | | Yellow | | |
| terminal module to one side, secured by protection cap | Length | 0.2 m | 20 82 600 1002 |  | |
| | | 0.4 m | 20 82 600 1004 | | |
| | | 0.6 m | **20 82 600 1006** | | |
| | | 0.8 m | 20 82 600 1008 | | |
| | I | 1.0 m | **20 82 600 1010** | | |
| | | 2.0 m | **20 82 600 1020** | | |
| | | 3.0 m | **20 82 600 1030** | | |
| | | 4.0 m | 20 82 600 1040 | | |
| | | 5.0 m | **20 82 600 1050** | | |
| | | 10.0 m | **20 82 600 1100** | | |
| terminal module to both sides, secured by protection cap | Length | 0.2 m | 20 82 600 2002 |  | |
| | | 0.4 m | 20 82 600 2004 | | |
| | | 0.6 m | **20 82 600 2006** | | |
| | | 0.8 m | 20 82 600 2008 | | |
| | II | 1.0 m | **20 82 600 2010** | | |
| | | 2.0 m | **20 82 600 2020** | | |
| | | 3.0 m | **20 82 600 2030** | | |
| | | 4.0 m | 20 82 600 2040 | | |
| | | 5.0 m | **20 82 600 2050** | | |
| | | 10.0 m | **20 82 600 2100** | | |
| Side 1 with terminal module, secured by protection cap<br>Side 2 RJ45 overmoulded, with locking lever protection | Length | 0.2 m | 20 82 601 1002 |  | |
| | | 0.4 m | 20 82 601 1004 | | |
| | | 0.6 m | **20 82 601 1006** | | |
| | | 0.8 m | 20 82 601 1008 | | |
| | III | 1.0 m | **20 82 601 1010** | | |
| | | 2.0 m | **20 82 601 1020** | | |
| | | 3.0 m | **20 82 601 1030** | | |
| | | 4.0 m | 20 82 601 1040 | | |
| | | 5.0 m | **20 82 601 1050** | | |
| | | 10.0 m | **20 82 601 1100** | | |



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# HARTING Ethernet cabling Ha-VIS preLink®

Ha-VIS preLink® Extender

## Advantages

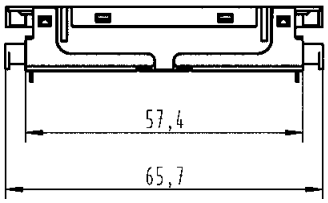
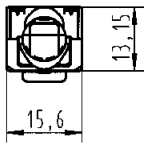
- Simple, fast and reliable connection of data cables
- Compact and robust design
- 360° shielding
- Category of transmission Cat. $6_A$
- Suitable for solid and stranded wires

## Application

- Extension of cables for data communication
- Connection of cables with different cross-sections
- Linking of fire compartments

## Technical characteristics

| | |
|---|---|
| Connector type | RJ45 connector acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, Class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Cable termination for preLink® terminal module, yellow, 20 82 000 0001 | |
| Connectable cables | |
| – Conductor cross section | AWG 23 … AWG 22 (solid and stranded) |
| – Conductor diameter | 1.3 … 1.6 mm |
| Cable termination for preLink® terminal module, white, 20 82 000 0003 | |
| Connectable cables | |
| – Conductor cross section | AWG 27 … AWG 26 (solid and stranded) |
| – Conductor diameter | 0.8 … 1.1 mm |
| Cable diameter | 5 … 9 mm |
| Degree of protection | IP20 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Ha-VIS preLink® Extender | 20 82 101 0001 |   |   |
| Ha-VIS preLink® RJ45 terminal module | | | |
| AWG 22/23, yellow[1)] | 20 82 000 0001 | | |
| AWG 26/27, white[1)] | 20 82 000 0003 | | |
| Ha-VIS preLink® assembly tool | 20 82 000 9901 | | |

[1)] Packaging with 10 pieces



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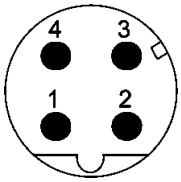
Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

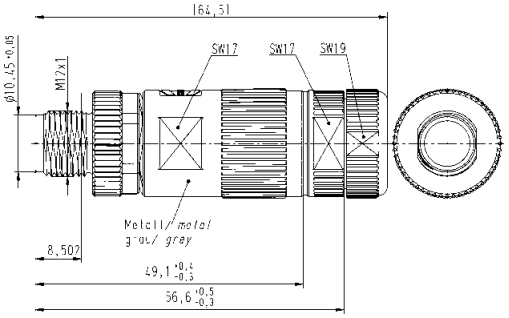
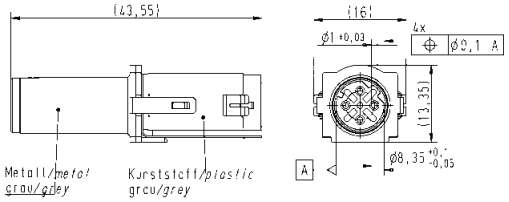
## Ha-VIS preLink® M12 connector D-coding

## Advantages

- M12 Ethernet-Data connector suitable for industry
- Robust design
- 360° shielding
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | M12 D-coding acc. to IEC 61 076-2-101 |
| Number of contacts | 4 |
| Transmission category | Category 5, Class D, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category 5 / Class D up to 200 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Cable termination for preLink® terminal module, yellow, 20 82 000 0001 | |
| Connectable cables | |
| – Conductor cross section | AWG 23 … AWG 22 (solid and stranded) |
| – Conductor diameter | 1.3 … 1.6 mm |
| Cable termination for preLink® terminal module, white, 20 82 000 0003 | |
| Connectable cables | |
| – Conductor cross section | AWG 27 … AWG 26 (solid and stranded) |
| – Conductor diameter | 0.8 … 1.1 mm |
| Cable diameter | 5 … 9 mm |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| preLink® M12 housing | 20 82 000 1210 |   | |
| preLink® M12 male module<br>Male<br>4 poles,<br>D-coding | 20 82 005 1214 |   | |
| preLink® M12 connector set<br>D-coding | 20 82 005 0001 | | |
| Ha-VIS preLink® RJ45 terminal module<br>AWG 22/23, yellow[1)] | 20 82 000 0001 | | |
| AWG 26/27, white[1)] | 20 82 000 0003 | | |
| Ha-VIS preLink® assembly tool | 20 82 000 9901 | | |

1) Packaging with 10 pieces



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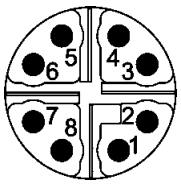
# HARTING Ethernet cabling Ha-VIS preLink®

PROFINET INDUSTRIAL ETHERNET

Mating face




X-coding
Mating face
acc. to IEC 61 076-2-101

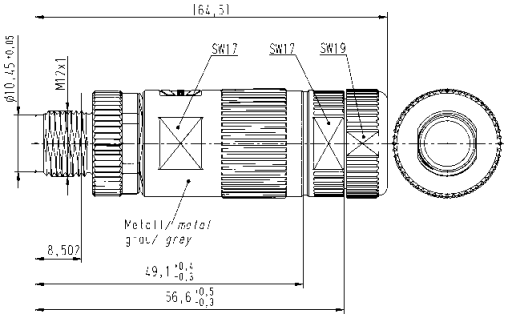
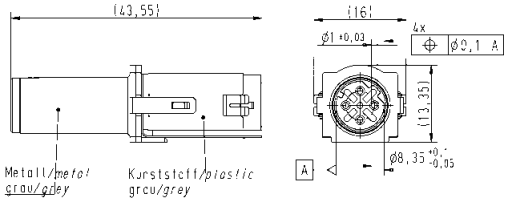
## Ha-VIS preLink® M12 connector X-coding

## Advantages

- M12 Ethernet-Data connector suitable for industry
- Robust design
- 360° shielding
- Category of transmission Cat. $6_A$
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | M12 X-coding acc. to IEC 61 076-2-101 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, Class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Cable termination for preLink® terminal module, yellow, 20 82 000 0001 | |
| Connectable cables | |
| – Conductor cross section | AWG 23 … AWG 22 (solid and stranded) |
| – Conductor diameter | 1.3 … 1.6 mm |
| Cable termination for preLink® terminal module, white, 20 82 000 0003 | |
| Connectable cables | |
| – Conductor cross section | AWG 27 … AWG 26 (solid and stranded) |
| – Conductor diameter | 0.8 … 1.1 mm |
| Cable diameter | 5 … 9 mm |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| preLink® M12 housing | 20 82 000 1210 |   | |
| preLink® M12 male module<br>Male<br>8 poles,<br>X-coding | 20 82 006 1218 |   | |
| preLink® M12 connector set<br>X-coding | 20 82 005 0002 | | |
| Ha-VIS preLink® RJ45 terminal module<br>AWG 22/23, yellow[1)]<br>AWG 26/27, white[1)] | <br>20 82 000 0001<br>20 82 000 0003 | | |
| Ha-VIS preLink® assembly tool | 20 82 000 9901 | | |

1) Packaging with 10 pieces



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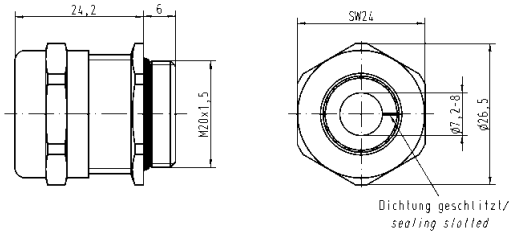
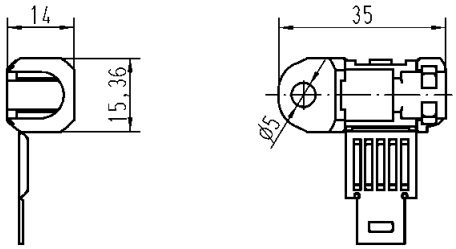
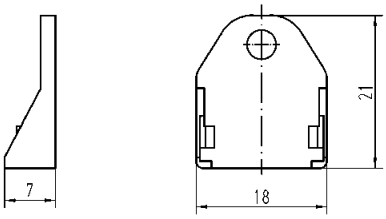
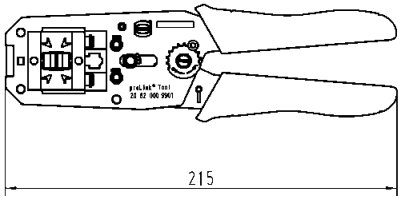
| Identification | Part number | |
|---|---|---|
| Cable gland M20x1.5<br>for pre-terminated Ha-VIS preLink® cable assemblies<br><br>with slotted seal<br><br>Cable-sheath 7.2 mm ... 8.0 mm<br><br>Cable-sheath 4.0 mm ... 6.5 mm<br><br> | <br><br><br><br>19 00 000 5020<br><br>19 00 000 5079 |  |
| Protection cover<br>for pre-terminated Ha-VIS preLink® cable assemblies<br><br>Set of 10 pieces<br><br> | 20 82 000 9915 |  |
| Unlocking tool<br>for Ha-VIS preLink® RJ45 module<br><br>Set of 5 pieces<br><br> | 20 82 000 9916 |  |
| HARTING Assembly tool<br>for Ha-VIS preLink® terminal module<br><br> | 20 82 000 9901 |  |



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# *har*-port coupler

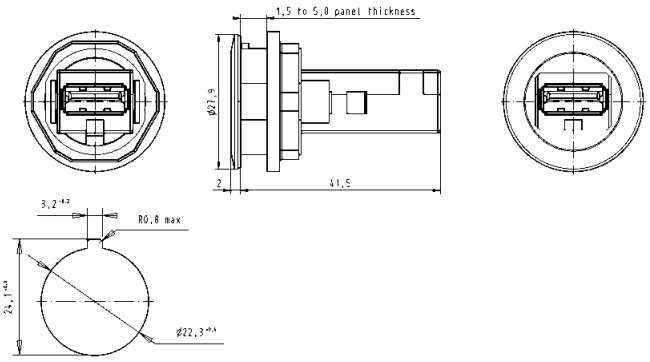
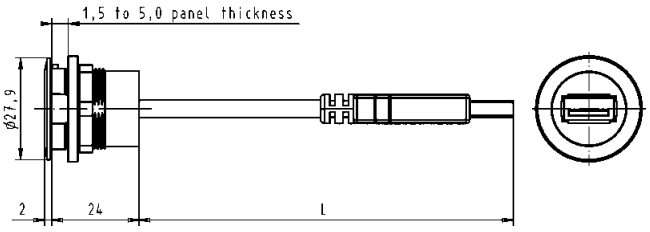
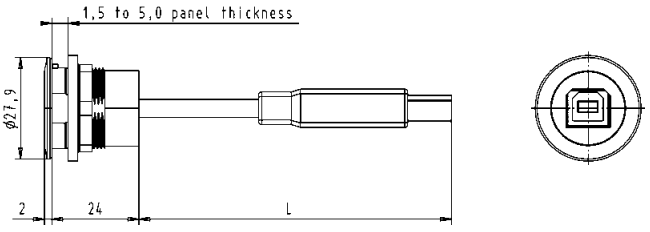
*har*-port USB coupler

## Advantages

- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Compact and robust design
- Practical accessories

## Technical characteristics

| | |
|---|---|
| Mounting | Screwable in cover plates (thread M22 x 1) |
| Degree of protection | IP20 |
| Mating cycles | min. 1500 |
| Temperature range | -25 °C ... +70 °C |
| Housing material | Polyamide |

| Identification | Part number silver | Part number black | Drawing | Dimensions in mm |
|---|---|---|---|---|
| ***har*-port USB 2.0 coupler** | | | | |
| Type A jack – Type A jack | 09 45 452 1901 | 09 45 452 1903 |  | |
| ***har*-port USB 3.0 coupler** | | | | |
| Type A jack – Type A jack | 09 45 452 1902 | 09 45 452 1904 | | |
| ***har*-port USB 2.0 coupler with cable** | | | | |
| Type A jack – Type A connector | | | | |
| Length: 0.5 m | 09 45 452 1920 | 09 45 452 1960 |  | |
| 1.0 m | 09 45 452 1921 | 09 45 452 1961 | | |
| 1.5 m | 09 45 452 1922 | 09 45 452 1962 | | |
| 2.0 m | 09 45 452 1923 | 09 45 452 1963 | | |
| 3.0 m | 09 45 452 1924 | 09 45 452 1964 | | |
| 5.0 m | 09 45 452 1925 | 09 45 452 1965 | | |
| Type B jack – Type B connector | | | | |
| Length: 0.5 m | 09 45 452 1910 | |  | |
| 1.0 m | 09 45 452 1911 | | | |
| 1.5 m | 09 45 452 1912 | | | |
| 2.0 m | 09 45 452 1913 | | | |
| 3.0 m | 09 45 452 1914 | | | |
| 5.0 m | 09 45 452 1915 | | | |



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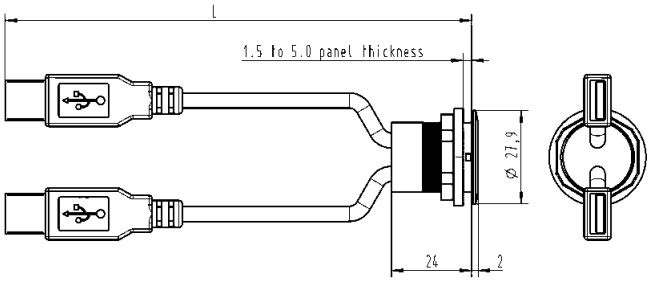
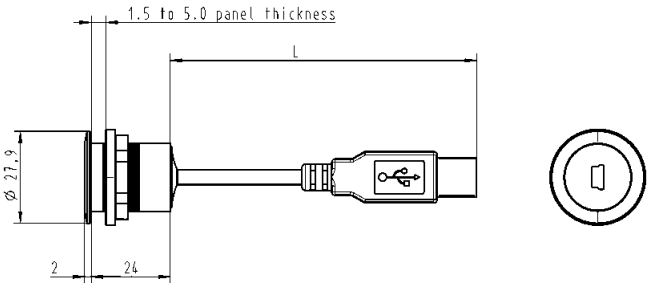
# *har*-port coupler

## *har*-port USB coupler

| Identification | Part number silver | Part number black | Drawing | Dimensions in mm |
|---|---|---|---|---|
| ***har*-port USB 2.0 coupler** | | | | |
| 2 x Type A jack – Type A connector | | | | |
| Length: 0.5 m | 09 45 452 1950 | | | |
| 1.0 m | 09 45 452 1951 | | | |
| 1.5 m | 09 45 452 1952 | | | |
| 2.0 m | 09 45 452 1953 | | | |
| 3.0 m | 09 45 452 1954 | | | |
| 5.0 m | 09 45 452 1955 | | | |
| ***har*-port USB 3.0 coupler** | | | | |
| Type A jack – Type A connector | | | | |
| Length: 0.5 m | 09 45 452 1930 | 09 45 452 1970 | | |
| 1.0 m | 09 45 452 1931 | 09 45 452 1971 | | |
| 1.5 m | 09 45 452 1932 | 09 45 452 1972 | | |
| 2.0 m | 09 45 452 1933 | 09 45 452 1973 | | |
| 3.0 m | 09 45 452 1934 | 09 45 452 1974 | | |
| 5.0 m | 09 45 452 1935 | 09 45 452 1975 | | |
| ***har*-port USB 2.0 coupler** | | | | |
| Type Mini-B jack – Type A connector | | | | |
| Length: 0.5 m | 09 45 452 1940 | | | |



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# *har*-port coupler

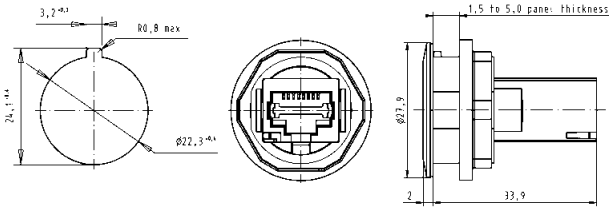
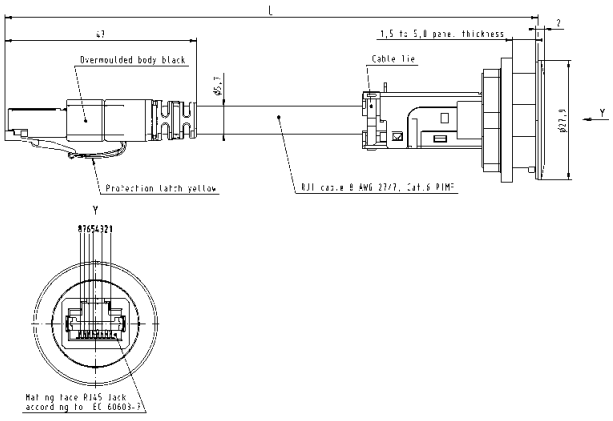
*har*-port RJ45 coupler

## Advantages

- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Transmission category 6, performance class $E_A$, suitable for 1/10 Gigabit Ethernet
- Compact and robust design
- Practical accessories

## Technical characteristics

| | |
|---|---|
| Number of ports | 2x RJ45 |
| Transmission performance | Category 6 / class $E_A$ acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | Fully shielded, 360° shielding contact |
| Mounting | Screwable in cover plates |
| Degree of protection | IP20 |
| Mating cycles | min. 750 |
| Temperature range | -25 °C ... +70 °C |
| Housing material | Polyamide |

| Identification | Part number silver | Part number black | Drawing | Dimensions in mm |
|---|---|---|---|---|
| *har*-port RJ45 Cat. 6 coupler | 09 45 452 1560 | 09 45 452 1561 |  | |
| *har*-port RJ45 Cat. 6 coupler with cable | | | | |
| Length: 0.15 m | 09 45 452 1500 | 09 45 452 1530 |  | |
| 0.2 m | 09 45 452 1501 | 09 45 452 1531 | | |
| 0.3 m | 09 45 452 1502 | 09 45 452 1532 | | |
| 0.5 m | 09 45 452 1504 | 09 45 452 1534 | | |
| 0.7 m | 09 45 452 1506 | 09 45 452 1536 | | |
| 1.0 m | 09 45 452 1509 | 09 45 452 1539 | | |
| 1.5 m | 09 45 452 1510 | 09 45 452 1540 | | |
| 2.0 m | 09 45 452 1511 | 09 45 452 1541 | | |
| 2.5 m | 09 45 452 1512 | 09 45 452 1542 | | |
| 3.0 m | 09 45 452 1513 | 09 45 452 1543 | | |
| 3.5 m | 09 45 452 1514 | 09 45 452 1544 | | |
| 4.0 m | 09 45 452 1515 | 09 45 452 1545 | | |
| 5.0 m | 09 45 452 1516 | 09 45 452 1546 | | |
| 7.5 m | 09 45 452 1517 | 09 45 452 1547 | | |
| 10.0 m | 09 45 452 1518 | 09 45 452 1548 | | |
| *har*-port HIFF coupler housing (for all HIFF compatible modules) | 09 45 452 0000 | 09 45 452 0001 | | |



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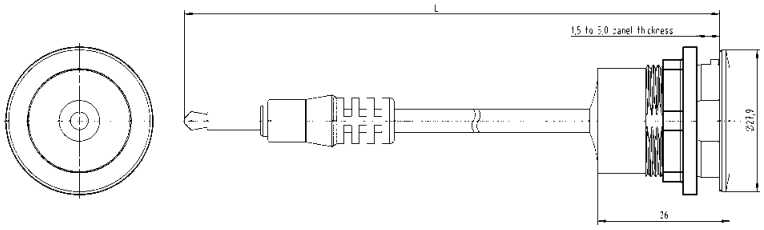
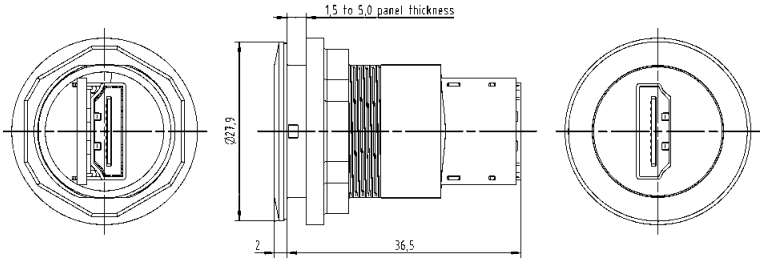
## *har*-port RJ45 coupler



| Identification | Part number silver | Drawing | Dimensions in mm |
|---|---|---|---|
| ***har*-port**<br>**audio interface**<br>**3.5 mm**<br>stereo phone jack<br>jack to connector | |  | |
| Length: 1.0 m | 09 45 452 1000 | | |
| 2.0 m | 09 45 452 1001 | | |
| **HDMI**<br>**video interface** | 09 45 452 1010 |  | |



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# *har*-port coupler

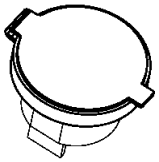
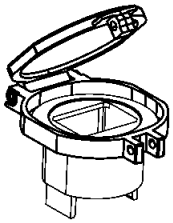
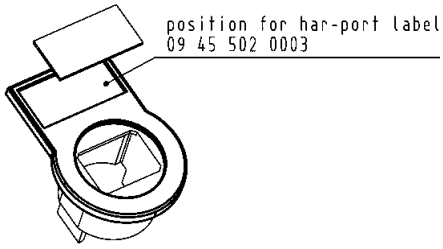
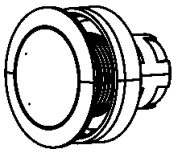
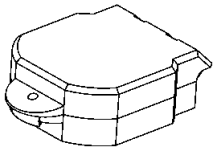
*har*-port accessories

## Advantages

- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Compact and robust design
- Practical accessories

## Technical characteristics

| | |
|---|---|
| Temperature range | -25 °C ... +70 °C |
| Housing material | Polyamide |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Accessories** | | | |
| *har*-port protection cover IP65 / IP67 black | 09 45 502 0000 |  | |
| *har*-port sealing cover | 09 45 502 0001 |  | |
| *har*-port label holder | 09 45 502 0002 | | |
| *har*-port label for label holder 09 45 502 0002 | 09 45 502 0003 |  | |
| *har*-port blind cover IP65 / IP67 | 09 45 502 0004 |  | |
| *har*-port protection cover IP65 / IP67 transparent | 09 45 502 0005 |  | |
| *har*-port protection cover IP65 / IP67 metal | 09 45 502 0006 | | |



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# Notes





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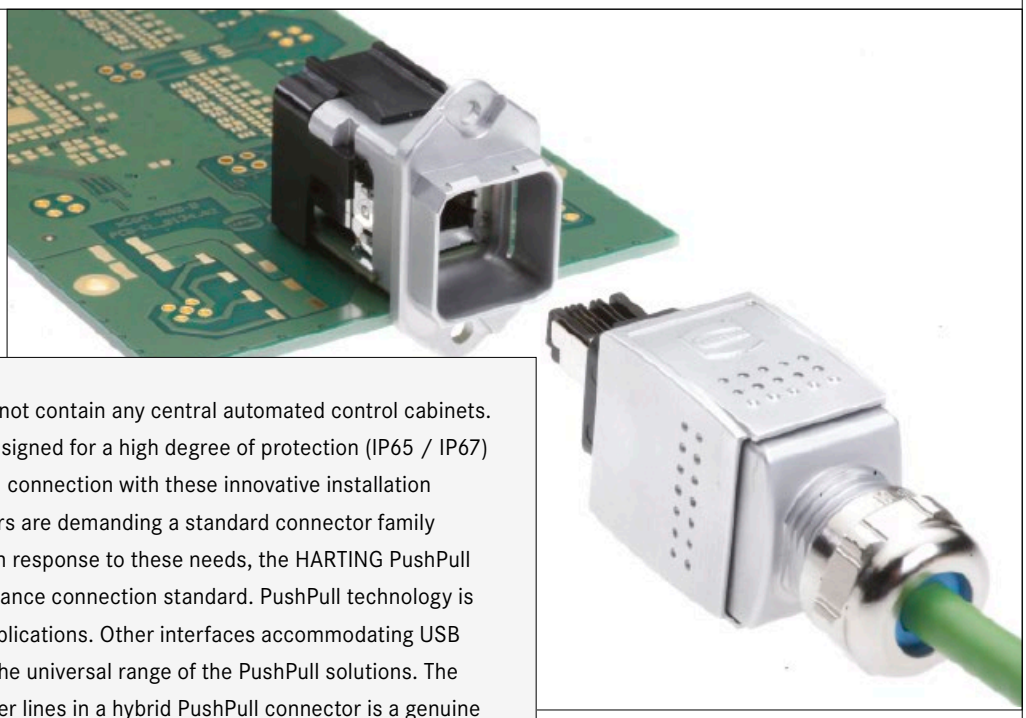
# 02. PushPull Connectors

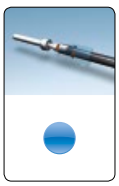
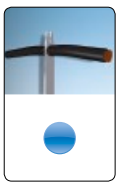
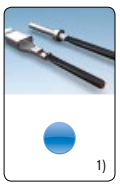


A distributed automation system does not contain any central automated control cabinets. Controls, sensors and actuators are designed for a high degree of protection (IP65 / IP67) and are installed directly in the field. In connection with these innovative installation concepts with distributed devices, users are demanding a standard connector family that is compatible with all interfaces. In response to these needs, the HARTING PushPull series has set the respective new appliance connection standard. PushPull technology is available for data, signal and power applications. Other interfaces accommodating USB or fiber optics (LC, SCRJ) supplement the universal range of the PushPull solutions. The integration of communication and power lines in a hybrid PushPull connector is a genuine trend-setting advance. In view of these strengths, the PushPull container has become the standard for current and future appliance interfaces. The German automotive industry, for example, has opted for the implementation of the PushPull connector family.

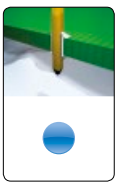
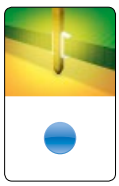
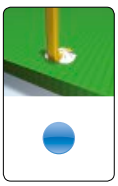
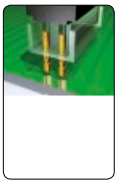
*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| | ● | | ● | ● | ● | ● | ● | ● | | ● |

**Cable termination**

| *Han-Quick Lock®* | *IDC HARAX®* | *Crimp* |
|---|---|---|
|  |  |  |
| ● | ● | ● [1] |
| *Screw* | *Cage clamp* | *Axial screw* |
| | | |

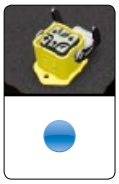
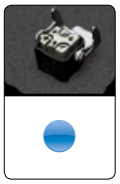
**PCB termination**

| *THT* | *SMC* | *SMT* |
|---|---|---|
|  |  |  |
| ● | ● | ● |
| *Press-in* | | |
|  | | |

**Application standard**

PROFINET · PROFIBUS · ISO IEC 24702 · EtherCAT Technology Group · ETHERNET POWERLINK

**Housing integration**

| *Separate housing* | *Integrated housing* |
|---|---|
|  |  |
| ● | ● |

[1] Piercing contacts

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The PushPull connector housing is a function container with degree of protection IP65 / IP67 and is available in two standardized housing sizes. These containers are equipped with standard RJ45, FOC or power contacts for operation at 5 x 16 A, depending on application requirements. The PushPull connector can be delivered either as plastic, or as metal variant, depending on the installation environment.

## THE PushPull PRINCIPLE

PushPull connector applications combine two basic advantages:

1. Simple operation
2. Safe and vibration resistant sealed IP65 / IP67 connection.

The innovative PushPull lock mechanism dispenses with the need for a latching bracket. The connector can be inserted with one hand, minimum force and an audible click for safe operation. The connection can be removed again just as easily for service work.

## COPPER, FOC AND POWER – IN THE SAME DESIGN

HARTING offers two series of the PushPull connector system, which differ in terms of their outer dimensions and module inserts.

## Han® PushPull (IEC 61 076-3-117 VARIANT 14)

This series represents the standard PROFINET device interface for the IP67 environment of the German automobile manufacturing industry.

The connector is available as metal and as plastic version. The RJ45 module for copper conductors and the SCRJ module for FOCs are available as data connectors. The RJ45 variant is realized by means of the RJ Industrial module equipped with *HARAX*® quick connection technology. The power module which is installed in the same container can be assembled on-site, either with crimp contacts or with innovative Quick Lock® technology in order to wire the distributed field devices to 230/400 V (16 A) power. This 5-pole connector enables the transfer of two independent 24 V control

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circuits with functional ground, or the transfer of a three-phase voltage of 400 V (16 A).

## HARTING PushPull (IEC 61 076-3-106 VARIANT 4)

This extremely compact and space-saving series provides an Ethernet appliance connection with degree of protection IP65 / IP67 that requires no more installation space than a M12 connector. The RJ45 variant for copper conductors and the LC variant for FOCs are available as modules for data connectors. The RJ45 variant is realized by means of *HARAX*® quick connection technology as used with HARTING RJ Industrial®. The 4-pole module for 48 V (12 A) or the 3-pole module for 250 V (16 A) can be used to supply power to the distributed field devices.

## HARTING PushPull HYBRID

The migration from Fieldbus to Ethernet within communication technology has simplified machine installation options. This simplification is attained by combining the data and the 24 V power lines in a single hybrid cable with hybrid connector, in connection with the spatial requirements of an M12 connector. The HARTING PushPull Hybrid offers trend-setting connection technology for this new method of machine installation.

The PushPull Hybrid reduces everything by half: the number of connection points and cables, and spatial requirements for the connection technology.

The PushPull Hybrid makes everything easier: machine installation, the wiring of connectors and safe insertion.

## APPLIANCE INTEGRATION:

In order to support the implementation of appliances with degree of protection IP65 / IP67, HARTING offers panel feed-through devices with integrated couplings and female contact modules for direct mounting on PCBs.

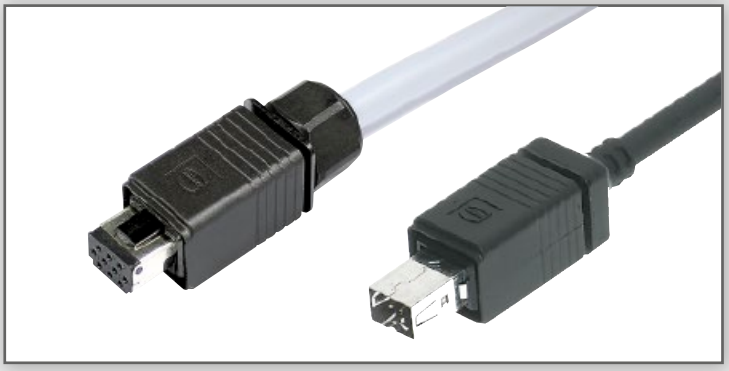
## HARTING PushPull
## ONE CONCEPT FOR DATA, SIGNAL AND POWER

The internationally standardized PushPull connector represents the latest generation of appliance connection technology with high degree of protection IP65 / IP67, easy insertion and snap-action engagement with audible click.

The PushPull housing family is designed for the integration of a wide range of contact inserts for data, signal and power lines.

INSTALLATION IN PLANTS
WITH Han® PushPull CONNECTORS:

- The standard for PROFINET communication
- One housing for the electrical and optical data transfer and for power supply
- Plastic or metal housing variants



INSTALLATION IN MACHINES
WITH HARTING PushPull HYBRID CONNECTORS:

- Combined data lines and appliance power supply up to 5 A in the same connector
- Compact size (comparable with M12)

POWER SUPPLY TO DISTRIBUTED DEVICES
USING PushPull CONNECTORS:

- Variant 4: 48 V (12 A), 4-pole or 250 V (16 A), 3-pole
- Variant 14: 400 V (12 A) 5-pole, or 24 V (16 A) 5-pole
- Latest connection technology QuickLock® for on-site assembly without special auxiliary tools

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# HARTING PushPull

HARTING PushPull Technology acc. to IEC 61076-3-106 variant 4
housing bulkhead mounting for device integration of RJ45-, USB- and Power-jacks

## Advantages

- PushPull housing bulkhead mounting with HARTING PushPull technology
- Compact, space-saving design for device integration of RJ45-, USB-, Signal- or Power-pcb female

Housing bulkhead mounting EasyInstall

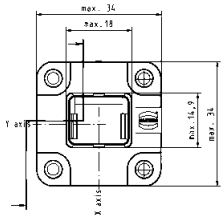
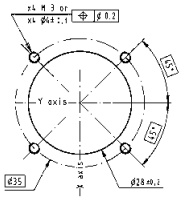
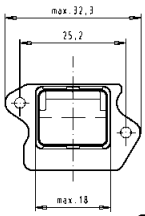
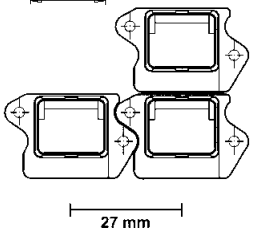
- for simple device integration round panel cut out

Housing bulkhead mounting Compact

- high packing density (spacing 27 x 21 mm)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61076-3-106 variant 4 |
| Shielding | fully shielded,<br>360° shielding contact |
| Mating cycles | min. 750 |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black<br>Zinc die-cast, shining |
| Flammability<br>acc. to UL 94 | V0 |
| | UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| **Housing bulkhead mounting – EasyInstall** | | | |
| with integrated seal<br>board drillings for M3 | | | |
| without fixing clip | 09 45 545 0030[1]<br>09 45 595 0030[2][4] |  | |
| with fixing clip | 09 45 545 0031[3]<br>09 45 595 0031[3][4] |  | Panel cut out |
| with fixing clip, for all HIFF compatible modules | 09 45 545 0032 | | |
| **Housing bulkhead mounting – Compact** | | | |
| Board drillings for M2.5 | | | |
| without fixing clip (incl. flat seal) | 09 45 545 0023[2] |  | |
| without fixing clip (with integrated seal) | 09 45 545 0033[2] | | |
| with fixing clip (incl. flat seal) | 09 45 545 0021[3] |  | |
| with fixing clip (with integrated seal) | 09 45 545 0029[3] | | |
| with fixing clip (with integrated seal) for vertical RJ jack 09 45 551 1103 | 09 45 545 0027 | | |
| with fixing clip, for all HIFF compatible modules | 09 45 545 0028 | | |

[1] suitable RJ45 jacks: 09 45 551 1100 / … 1110 / … 1102 / … 1103 / … 1130 / … 1530
[2] suitable RJ45 jacks: 09 45 551 1100 / … 1110 / … 1102 / … 1130 / … 1530
[3] suitable RJ45 jacks: 09 45 551 1100 / … 1110 / … 1102
[4] Metal version



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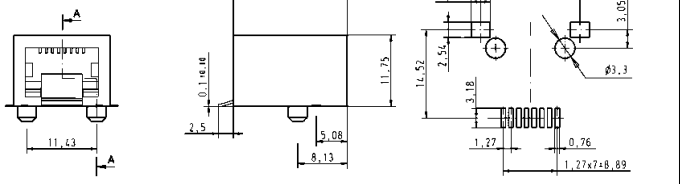
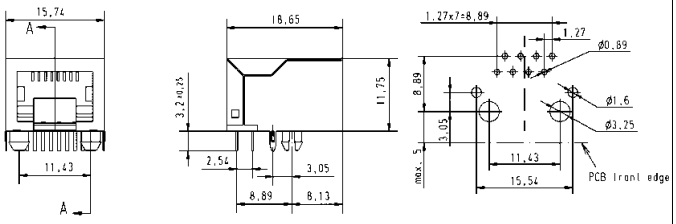
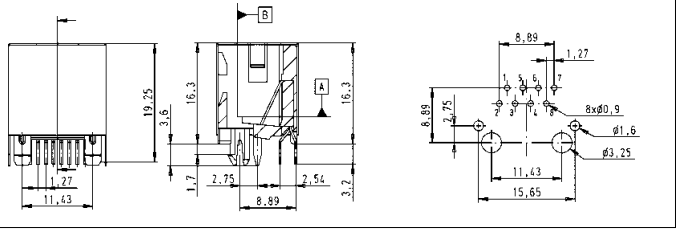
HARTING PushPull Technology acc. to IEC 61076-3-106 variant 4
RJ45 jacks and accessories

## Advantages

- HARTING PushPull technology
- Low-profile jacks for space-saving PCB integration
- Category of transmission Cat. 5
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology acc. to IEC 61076-3-106 variant 4 |
| Transmission rate | 10/100/1000 Mbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mating cycles | min. 750 |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |
| | UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Components device side | | | pcb layout |
| RJ45 jacks Cat. 5 | | | |
| Solder variant SMD, 90° angled | 09 45 551 1100[1]<br>09 45 551 1110[2] |  | |
| Solder variant overmolded, 90° angled | 09 45 551 1102[1] |  | |
| Solder variant overmolded, straight | 09 45 551 1103[3] |  | |

1) Packaging: Blister à 120 pieces
2) Packaging: Tape & Reel à 130 pieces
3) Packaging: Tape & Reel à 80 pieces



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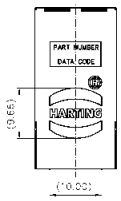
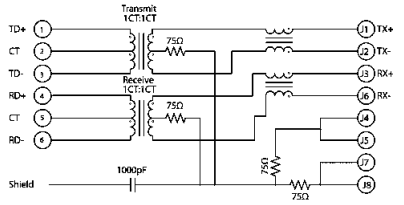
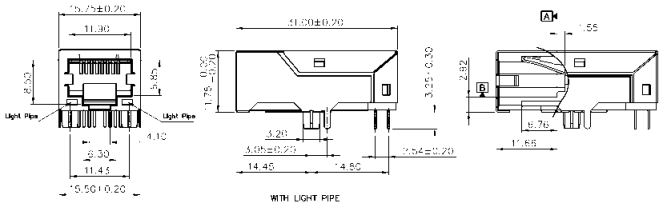
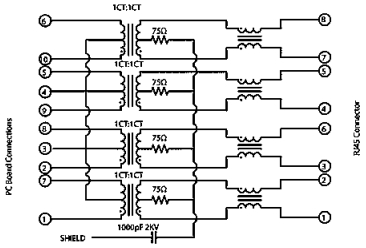
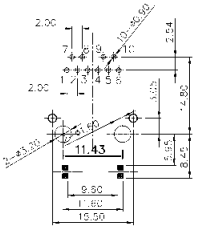
HARTING RJ Industrial® RJ45 jacks with transformer

## Advantages

- Compact design
- Integrated optical fibres
- Excellent EMC behaviour due to integrated transformers and filters for 10/100 Mbit or 1 Gbit Ethernet
- SMC compatible
- Versions from 10/100 Mbit up to 10 Gbit Ethernet and PoE
- Usable for IP65 / IP67 device integration with HARTING PushPull and Han® 3 A RJ45

## Technical characteristics

| | |
|---|---|
| Mating face | RJ45 acc. to IEC 60603-7 |
| Number of contacts | 8 |
| Degree of protection | IP20 |
| Rated voltage | 30 V DC |
| Rated current | 8 mA DC |
| Mating cycles | min. 750 |
| Temperature range | -25 °C … +70 °C |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| RJ45 jack with transformer (low profile) | | | |
| 90° angled, THT<br>10/100 Mbit Ethernet | 09 45 551 1150[1)] |  | |
| Schematic:<br>  | | | |
| 10/100 Mbit Ethernet and PoE | 09 45 551 1151[1)] |  | |
| 90° angled, THT<br>1 Gbit Ethernet | 09 45 551 1540[1)] | | |
| Schematic:<br>  | | | |
| 1 Gbit Ethernet and PoE | 09 45 551 1541[1)] |  | |
| | | Customer specific versions on request | |

[1)] Packaging: Blister à 56 pieces



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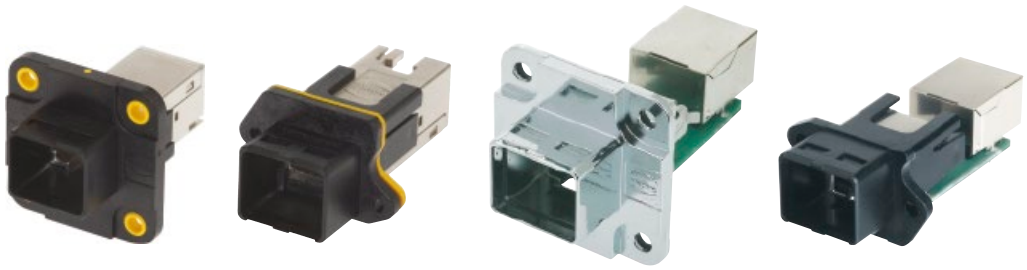
# HARTING PushPull RJ45





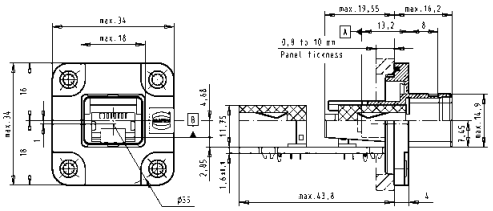
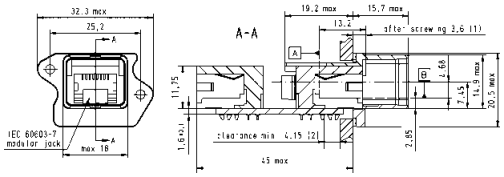
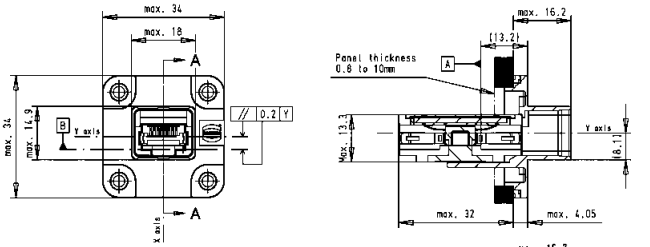
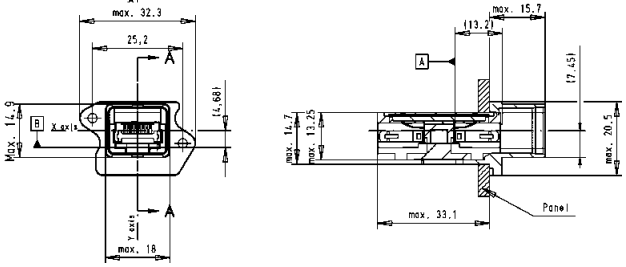
HARTING PushPull Technology acc. to IEC 61076-3-106 variant 4
RJ45-panel feed-throughs and accessories

## Advantages

- Small, space-saving PushPull Interfaces in IP65 / IP67
- Easy handling of RJ45 patch cords in switch cabinets or sets
- Mounting to casings

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology acc. to IEC 61076-3-106 variant 4 |
| Transmission rate cat. 5 versions | 10/100/1000 Mbit/s |
| Transmission rate cat. 6 versions | 10/100 Mbit/s / 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mating cycles | min. 750 |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black<br>Zinc die-cast, shining |
| Flammability acc. to UL 94 | V0<br>UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Panel feed-through set category of transmission Cat. 5** | | | |
| incl. housing bulkhead mounting EasyInstall with integrated seal, 2 x RJ45-jack board drillings for M3 | 09 45 245 1130<br>09 45 295 1130 (metal version) |  | |
| incl. housing bulkhead mounting Compact, flat seal, 2 x RJ45-jack board drillings for M2.5 | 09 45 245 1102 |  | |
| **Panel feed-through set category of transmission Cat. 6** | | | |
| incl. housing bulkhead mounting EasyInstall with integrated seal, 2 x RJ45-jack board drillings for M3 | 09 45 245 1590 |  | |
| incl. housing bulkhead mounting Compact, with integrated seal, 2 x RJ45-jack | 09 45 245 1560 |  | |

Panel cut outs see page 02.04



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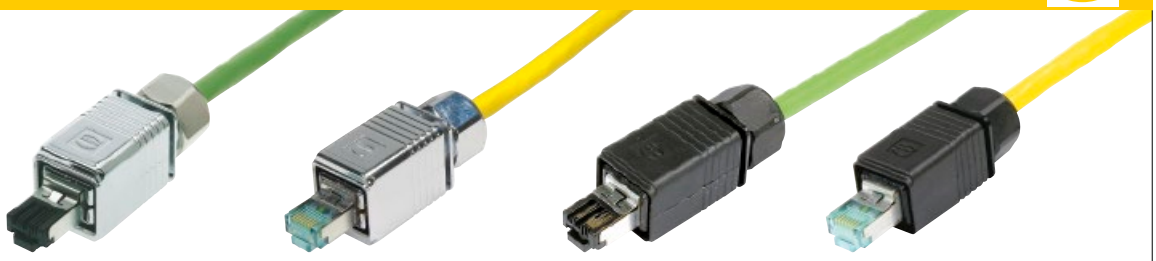
# HARTING PushPull RJ45



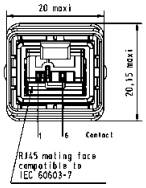
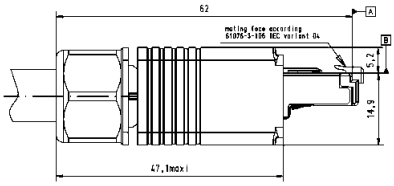
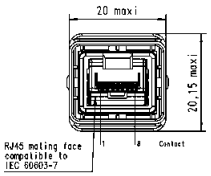
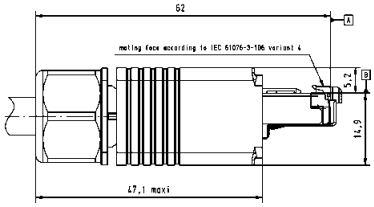
HARTING PushPull Technology acc. to IEC 61076-3-106 variant 4
RJ45-connector

## Advantages

- Ethernet connector based on RJ45
- Fully shielded, 360° shielding contact
- Field-assembly connector
  with IDC contacts (Cat. 5 versions)
  or piercing contacts (Cat. $6_A$ versions)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60603-7 |
| Cable diameter | 4.9 ... 8.6 mm |
| Termination cross section | |
| Cat. 5 | AWG 24/7 ... AWG 22/7 (stranded)<br>AWG 23/1 ... AWG 22/1 (solid) |
| Cat. $6_A$ | AWG 24/7 ... AWG 28/7 (stranded) |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black<br>Zinc die-cast, shining |
| Flammability<br>acc. to UL 94 | V0 |
| | UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Connector, 4-poles**<br>**Cat. 5** | | | |
| incl. housing with RJ45 connector, shielding and cable gland | 09 45 145 1100<br>09 45 195 1100<br>(metal version) |  |  |
| **Connector, 8-poles**<br>**Cat. $6_A$** | | | |
| incl. housing with RJ45 connector, shielding and cable gland | 09 45 145 1520<br>09 45 145 1520 XL[1)]<br>09 45 195 1520<br>(metal version) |  |  |
| suitable assembly tool | 09 45 800 0520 | | |



[1)] Packaging with 100 sets

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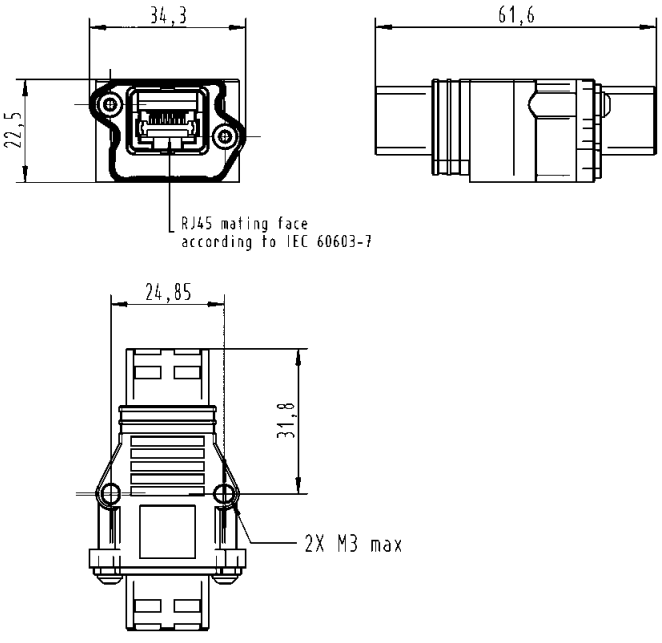
HARTING PushPull RJ45 – bulkhead

## Advantages

- Small, space-saving PushPull Interfaces in IP65 / IP67
- Easy connection of PushPull RJ45 system cords
- Screwable with 2 x M3 screws

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61 076-3-106 variant 4 |
| Number of contacts | 8 |
| Transmission category | Cat. 6, performance class $E_A$,<br>suitable for 1/10 Gigabit Ethernet |
| Transmission rate | 10/100 Mbit/s / 1/10 Gbit/s |
| Shielding | fully shielded,<br>360° shielding contact |
| Mating cycles | min. 750 |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black |
| Flammability<br>acc. to UL 94 | V0 |
| | UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING PushPull RJ45 – bulkhead | 09 45 345 1560 |  | |





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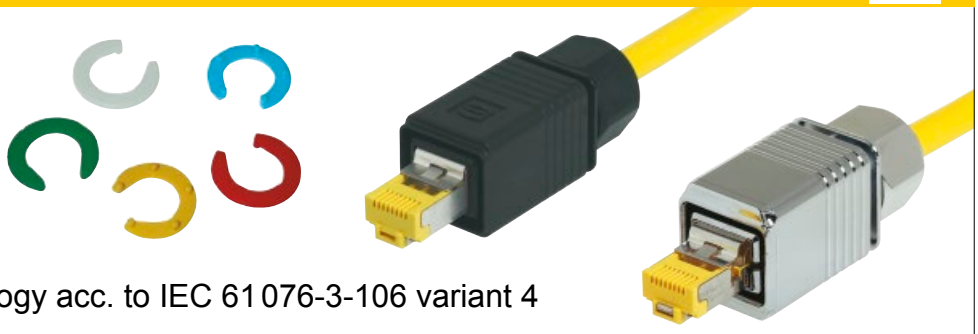
# HARTING PushPull RJ45



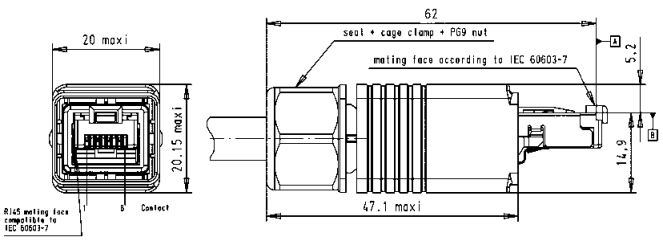
HARTING PushPull Technology acc. to IEC 61076-3-106 variant 4
RJ45-connector

## Advantages

- Ethernet connector based on RJ45
- Fully shielded, 360° shielding contact
- Field-assembly connector with IDC contacts
- Category of transmission: Cat. 6 / class $E_A$ suitable for 1/10 Gbit Ethernet

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61076-3-106 variant 4 |
| Mating face | RJ45 acc. to IEC 60603-7 |
| Cable diameter | 4.9 ... 8.6 mm |
| Termination cross section | AWG 27/7 ... AWG 22/7 (stranded)<br>AWG 24/1 ... AWG 22/1 (solid) |
| Conductor diameter | max. 1.6 mm (incl. insulation) |
| Mating cycles | min. 750 |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black<br>Zinc die-cast, shining |
| Flammability acc. to UL 94 | V0 |
| | UL approval (E102079) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Connector, 8-poles<br>Cat. 6<br>incl. housing with RJ45 connector, shielding and cable gland | 09 45 145 1560<br>09 45 145 1560 XL[1]<br>09 45 195 1560<br>(metal version) |  | |
| Colour clips<br>for colour coding the HARTING PushPull connectors | | | |
| White | 09 45 840 0011 | | |
| Yellow | 09 45 840 0013 | | |
| Red | 09 45 840 0017 | | |
| Blue | 09 45 840 0018 | | |
| Green | 09 45 840 0019 | | |



[1] Packaging with 100 sets



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# HARTING PushPull LC duplex

HARTING PushPull type acc. to IEC 61 076-3-106 variant 4
LC duplex panel feed-through and connector

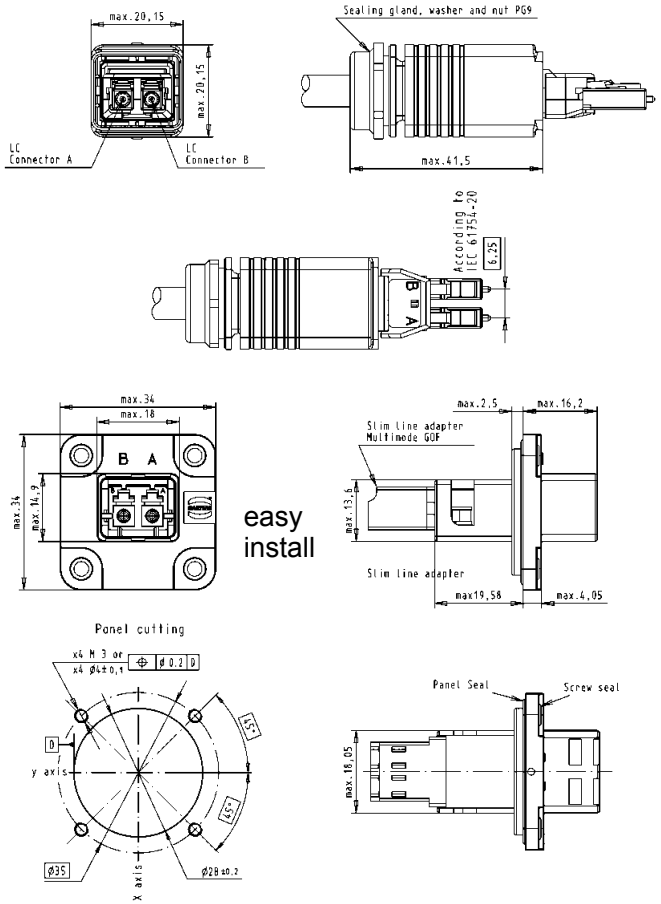
## Advantages

- Optical PushPull connector based on LC with small form factor (requires 50 % compared to SC and ST)
- EasyInstall and Compact panel feed-through for simple device integration
- Optical module with inserts acc. to IEC 61 754-20
- One-piece LC body assures high mechanical stability
- A & B parts identification for Duplex according TIA 568 standard

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61 076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Mating face | LC acc. to IEC 61 754-20 |
| Cable diameter | 5.8 ... 7.2 mm |
| Mating cycles | min. 200 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black<br>Zinc die-cast, shining |
| Flammability<br>acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING PushPull LC duplex | | | |
| Cable side | | | |
| Multimode GOF | 09 57 402 0500 000 | | |
| | 09 57 409 0500 000 (metal version) | | |
| Singlemode GOF | 09 57 402 0501 000 | | |
| | 09 57 409 0501 000 (metal version) | | |
| Device side EasyInstall version | | | |
| Multimode GOF | 09 57 441 0500 000 | | |
| | 09 57 468 0500 000 (metal version) | | |
| Singlemode GOF | 09 57 441 0501 000 | | |
| | 09 57 468 0501 000 (metal version) | | |
| Device side Compact version | | | |
| Multimode GOF | 09 57 442 0502 001 | | |
| Singlemode GOF | 09 57 442 0503 001 | | |



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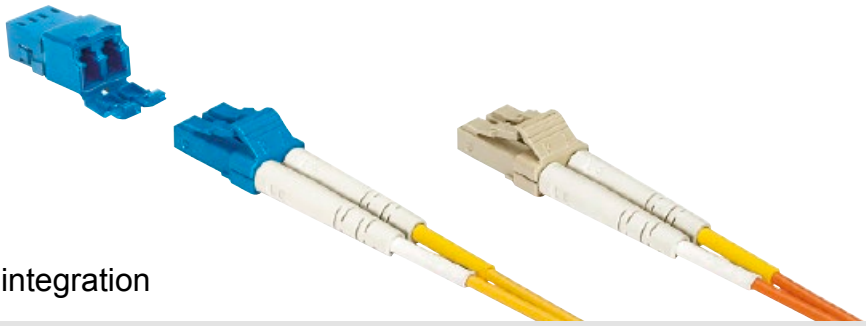
# HARTING PushPull LC duplex



LC duplex IP20 adapter for device integration

## Advantages

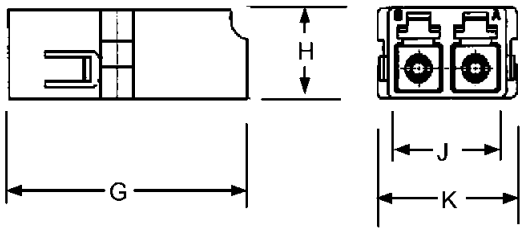
- Small form factor requires 50 % (compared to SC and ST)
- Compact, space-saving design
- High packing density
- A & B parts identification according TIA 568 standard
- Complement adapter for IP67 connector on device side

## Technical characteristics

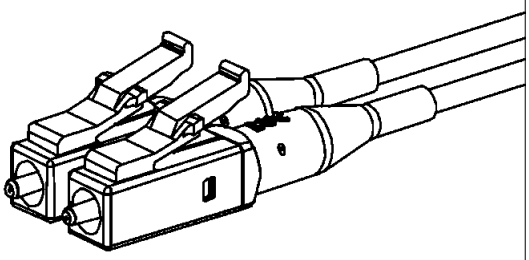
| | |
|---|---|
| Degree of protection | IP20 |
| Mating interface | LC duplex with two fibres |
| Temperature range | -40 °C … +70 °C |

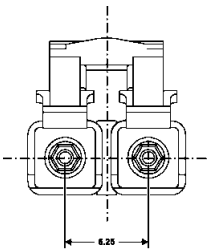
| Identification | Part number |
|---|---|
| Device side | |
| Adapter | |
| Multimode GOF | 09 57 400 0003 000 |
| Singlemode GOF | 09 57 400 0004 000 |
| Connector LC duplex | |
| Multimode GOF | 09 57 400 0001 000 |
| Singlemode GOF | 09 57 400 0002 000 |

Drawing — Dimensions in mm




| | min. | max. |
|---|---|---|
| G | 26.60 | 26.80 |
| H | 9.35 | 9.45 |
| J | 12.80 | 12.90 |
| K | 15.24 | 15.34 |





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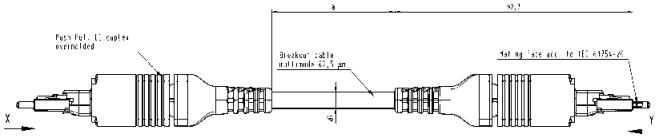
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Fibre optic cable, double ended, multi mode, 62.5 µm overmolded** | | double ended | |
| Length: a = 1 m | 33 58 231 0010 016 |  | |
| a = 5 m | 33 58 231 0050 016 | | |
| a = 10 m | 33 58 231 0100 016 | a = length | |
| a = 20 m | 33 58 231 0200 016 | | |
| a = 40 m | 33 58 231 0400 016 | | |
| a = 50 m | 33 58 231 0500 016 | | |
| a = 60 m | 33 58 231 0600 016 | | |
| a = 100 m | 33 58 231 1000 016 | | |
| a = 300 m | 33 58 231 3000 016 | | |
| **Fibre optic breakout cable, multi mode, 62.5 µm** | | | |
| Length: 10 m | 33 58 751 0100 001 | | PUR jacket<br>2-fibre multi mode 62.5 µm<br>Outer diameter: 7 mm<br>Min. bending radius:<br>Installation: 10.5 cm<br>Operating: 7.0 cm |
| Length: 20 m | 33 58 751 0200 001 | | |
| Length: 100 m | 33 58 751 1000 001 | | |



Further cable lengths are available on request



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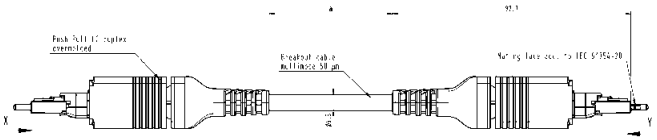
# HARTING PushPull LC duplex

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Fibre optic cable, double ended, multi mode, 50 µm overmolded** | | double ended | |
| Length: a = 1 m | 33 58 231 0010 017 |  | |
| a = 5 m | 33 58 231 0050 017 | | |
| a = 10 m | 33 58 231 0100 017 | a = length | |
| a = 20 m | 33 58 231 0200 017 | | |
| a = 40 m | 33 58 231 0400 017 | | |
| a = 50 m | 33 58 231 0500 017 | | |
| a = 60 m | 33 58 231 0600 017 | | |
| a = 100 m | 33 58 231 1000 017 | | |
| a = 300 m | 33 58 231 3000 017 | | |
| **Fibre optic breakout cable, multi mode** | | | |
| Length: 10 m | 33 58 751 0100 003 | PUR jacket | |
| Length: 20 m | 33 58 751 0200 003 | 2-fibre multi mode | 50 µm |
| Length: 100 m | 33 58 751 1000 003 | Outer diameter: | 6.5 mm |
| | | Min. bending radius: | |
| | | Installation: | 10.4 cm |
| | | Operating: | 5.2 cm |



Further cable lengths are available on request

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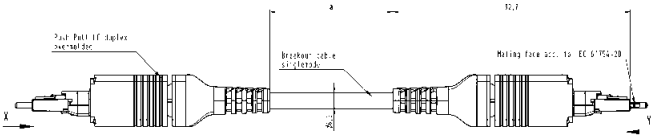
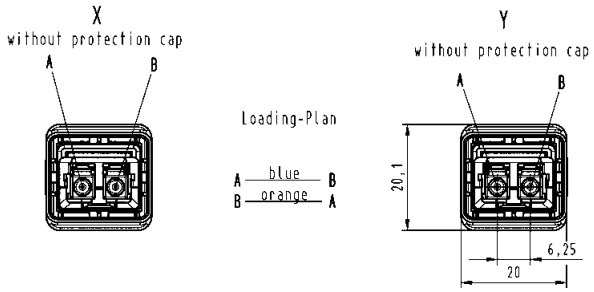
# HARTING PushPull LC duplex

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Fibre optic cable, double ended, single mode overmolded** | | double ended | |
| Length: a = 1 m | 33 58 231 0010 015 |  | |
| a = 5 m | 33 58 231 0050 015 | | |
| a = 10 m | 33 58 231 0100 015 | a = length | |
| a = 20 m | 33 58 231 0200 015 | | |
| a = 40 m | 33 58 231 0400 015 |  | |
| a = 50 m | 33 58 231 0500 015 | | |
| a = 60 m | 33 58 231 0600 015 | | |
| a = 100 m | 33 58 231 1000 015 | | |
| a = 300 m | 33 58 231 3000 015 | | |
| **Fibre optic breakout cable, single mode** | | | |
| Length: 10 m | 33 58 751 0100 002 | PUR jacket<br>2-fibre single mode<br>Outer diameter: 6.5 mm<br>Min. bending radius:<br>Installation: 10.4 cm<br>Operating: 5.2 cm | |
| Length: 20 m | 33 58 751 0200 002 | | |
| Length: 100 m | 33 58 751 1000 002 | | |

Further cable lengths are available on request



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# Notes





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# HARTING PushPull Hybrid

HARTING PushPull Hybrid
type acc. to IEC 61 076-3-106 variant 4

## Advantages

HARTING PushPull Hybrid

In the future all new machine generations will be equipped with Fast Ethernet, no matter if PROFINET, Ethernet/IP, Powerlink, Ethercat, Varan or other Ethernetprofiles.

With the change of the communication technology also the possibility is offered of simplifying the machine installation and of introducing an innovative Hybrid installation concept. This simplification will unite by data and 24 V (5 A)-supply in a Hybrid cable, at least with the space requirement of a M12-connector.

For this new installation solution HARTING with the HARTING PushPull Hybrid offers the trend-setting installation technology.

Everything is halved: the number of pluggings, the number of cables and the space requirement for the connection technology. Everything becomes simpler: the installation, attaching and safe plugging.

The Hybrid connectors were developed particular under the criteria of simple attaching in the field and the particular safe data communication with the patented omega screen concept. As contacts D-Sub and HDD Sub contacts worked world-wide are used. This socket pin contact system ensures highest reliability and optimal shock and vibration stability.

With the optional available coding pins 6 different codings can be realized.

## Technical characteristics

**Advantages**

- Compact, space-saving design
- Very compact housing with high degree of protection
- Polarisation with nose
- Sixfold codable

**Typical application areas**

- Factory and building automation
- Industrial electronics
- Telecommunication and wireless networks
- Transportation
- Industrial monitoring and camera systems
- Lighting and display technology
- Access control systems

**Recommended pin assignment**

- Power contacts

| Contact | Function | Conductor colour |
|---|---|---|
| 1 | V + | Red |
| 2 | Ground | Brown |
| 3 | V + (switched) | Yellow |

- Data contacts

| Contact | Signal | Function | Conductor colour |
|---|---|---|---|
| 4 | RD – | Receiver Data – | Blue |
| 5 | RD + | Receiver Data + | White |
| 6 | TD – | Transmission Data – | Orange |
| 7 | TD + | Transmission Data + | Yellow |

Structure Hybrid cable
Data: 4x AWG26/7
Power: 3x AWG20/7





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# HARTING PushPull Hybrid

HARTING PushPull Hybrid, type acc. to IEC 61 076-3-106 variant 4
device side

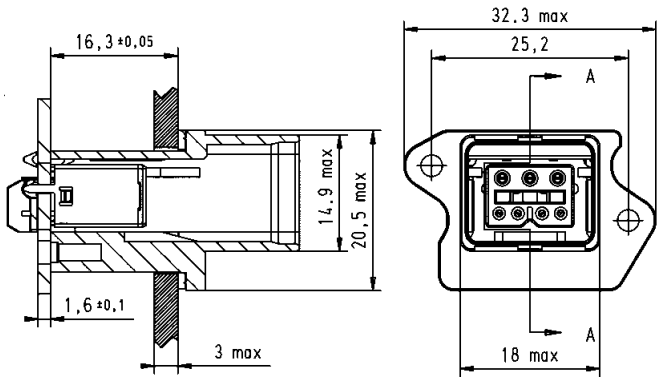
## Advantages

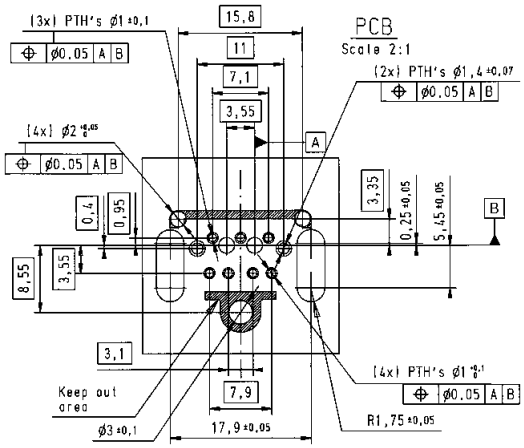
- Combined data- and power-supply up to 5 A/48 V included to one connector
- HARTING PushPull technology
- Compact design
- High packing density
- Sixfold codable
- Suitable for all Fast-Ethernet variants

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology acc. to IEC 61 076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Termination | Solder pins |
| Transmission performance | Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN ISO 50 173-1 |
| Transmission rate | 10 / 100 Mbit/s |
| Number of contacts | Data: 4, shielded (Ethernet) Power: 3, (5 A / 48 V) |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| **Set straight**<br>HARTING PushPull Hybrid housing bulkhead mounting and pcbs female shielded, IP65 / IP67, black, 180° straight | 09 45 245 1300 | | |
| **Set angled**<br>HARTING PushPull Hybrid housing bulkhead mounting and pcbs female shielded, IP65 / IP67, black, 90° angled | 09 45 245 1310 | | |
| **Female insert** | | | |
| PCB jack shielded 180° straight | 09 45 545 1300 | | |
| PCB jack shielded 90° angled | 09 45 545 1305 | | |
| **Housing bulkhead mounting** | | | |
| for female insert straight | 09 45 545 1320 | | |
| for female insert angled | 09 45 545 1325 | | |
| **Panel feed-through**<br>1 x Hybrid female IP65 / IP67 on 1 x RJ45 female and 3 pcb clamps, board drillings for M2.5 | 09 45 245 1320 | | |



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# HARTING PushPull Hybrid

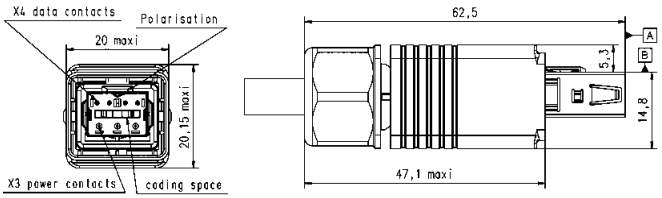
HARTING PushPull Hybrid, type acc. to IEC 61 076-3-106 variant 4
Hybrid connector

## Advantages

- Combined data- and power-supply up to 5 A / 48 V included to one connector
- HARTING PushPull technology
- Compact design
- High packing density
- Sixfold condable
- Suitable for all Fast-Ethernet variants

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61 076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Termination | Crimp |
| Cable diameter | AWG 26 for Ethernet<br>AWG 20 for Power |
| Transmission performance | Category 5 / Class D<br>up to 100 MHz acc. to<br>ISO/IEC 11 801:2002,<br>EN ISO 50 173-1 |
| Number of contacts | Data: 4, shielded (Ethernet)<br>Power: 3, (5 A / 48 V) |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Connector**<br>HARTING PushPull Hybrid connector, IP65/ 67, black, with cable gland and crimp contacts | |  | |
| straight | 09 45 145 1300 | | |
| **Accessories – Coding pin set**<br>to avoid accidental incorrect mating a coding system is required. This coding pins are inserted without loss of contact. | 09 45 845 1300 | | |
| **Tools** | | | |
| Crimping tool for data contacts | 09 99 000 0535 | | |
| Crimping tool for power contacts | 09 99 000 0175 | | |
| **Insertion and removal tool** | | | |
| for data contacts | 09 99 000 0513 | | |
| for power contacts | 09 99 000 0171 | | |



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# HARTING PushPull Hybrid

HARTING PushPull Hybrid, type acc. to IEC 61 076-3-106 variant 4
overmoulded Hybrid system cables

## Advantages

- Combined data- and power-supply up to 5 A / 48 V included to one connector
- HARTING PushPull technology
- Robust design, suitable for industrial applications
- High packing density
- Sixfold codable
- Suitable for all Fast-Ethernet variants

## Technical characteristics

| | |
|---|---|
| Cable construction: | Twisted Pair shielded<br>+ 3 Power cables |
| Core structure | Data: 4x AWG 26/7<br>Power: 3x AWG 20/7 |
| Transmission performance | Category 5 / Class D<br>up to 100 MHz acc. to<br>ISO/IEC 11 801:2002,<br>EN ISO 50 173-1 |
| Sheath material | FRNC |
| Cable-<br>outer diameter | ø (7.0 ±0.4) mm |
| Shielding | Shielding foil<br>and shielding braid |
| Temperature range | -40 °C … +80 °C |
| Colour | black |

| Identification | | Part number |
|---|---|---|
| **System cables**<br>**2x HARTING PushPull Hybrid** | | |
| Length | 0.5 m | 09 47 616 1005 |
| | 0.8 m | 09 47 616 1008 |
| | 1 m | 09 47 616 1010 |
| | 2 m | 09 47 616 1020 |
| | 3 m | 09 47 616 1030 |
| | 5 m | 09 47 616 1050 |
| | 10 m | 09 47 616 1100 |
| | 20 m | 09 47 616 1200 |
| **Hybrid cable** | | |
| ring | 20 m | 09 45 600 0331 |
| ring | 50 m | 09 45 600 0341 |
| ring | 100 m | 09 45 600 0301 |
| reel | 500 m | 09 45 600 0321 |

Drawing

Structure Hybrid cable

Dimensions in mm



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# HARTING PushPull Signal

HARTING PushPull, type acc. to IEC 61 076-3-106 variant 4
10-poles 50 V / 5 A

## Features

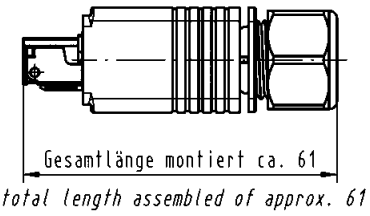
- HARTING PushPull technology
- For the transmission of analog, low voltage and bus signals
- Fully shielded
- 10 contacts
- Touch-proof
- Easy and fast cable installation

## Technical characteristics

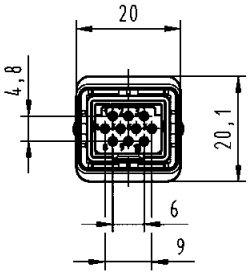
| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Mating face | acc. to IEC/PAS 61 076-3-11x |
| Number of contacts | 10 |
| Electrical data<br>acc. to DIN EN 61 984 | 5 A 50 V 1.5 kV 3 |
| Contact resistance | 10 mΩ |
| Termination | Crimp or solder |
| Conductor cross section | AWG 24 … 18; 0.25 … 0.82 mm² |
| Conductor diameter | max. 2.1 mm |
| Outer cable diameter | 4.9 … 8.6 mm |
| Shielding | Fully shielded, 360° shielding contact |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number |
|---|---|
| **HARTING PushPull Signal** | |
| Connector set 10-poles<br>incl. plastic housing<br>and female insert | 09 45 145 9010 |
| Order D-Sub crimp female contacts separately | |
| **D-Sub crimp contacts for cable side** | |
| female, turned<br>AWG 24-20; 0.25 - 0.52 mm² | 09 67 000 8476[1)] |
| female, turned<br>AWG 22-18; 0.33 - 0.82 mm² | 09 67 000 3476[1)] |
| female, stamped<br>AWG 24-20; 0.25 - 0.56 mm² | 09 67 000 8278[2)] |

Drawing




Dimensions in mm




[1)] To be used with crimp tool 09 99 000 0501. Suitable locator: 09 99 000 0531
[2)] To be used with crimp tool 09 99 000 0175.



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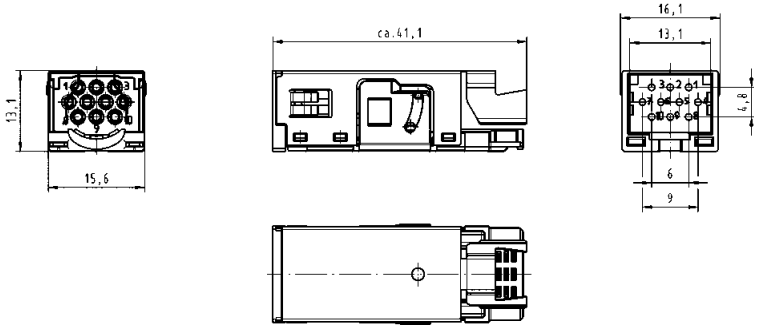
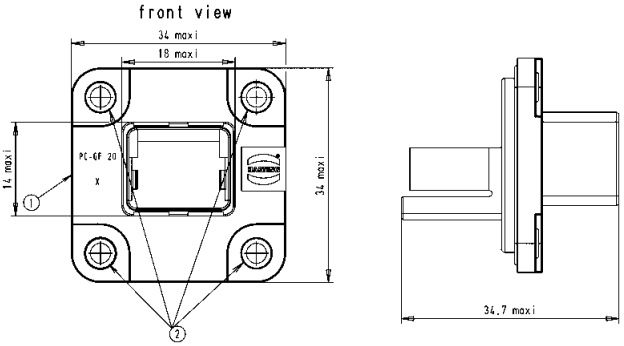
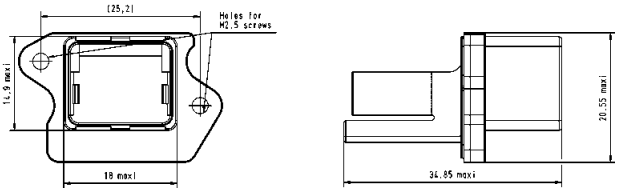
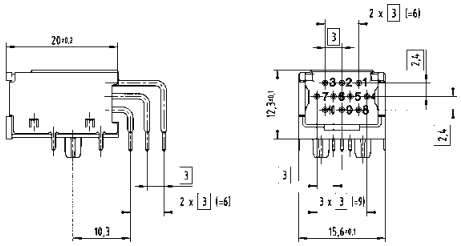
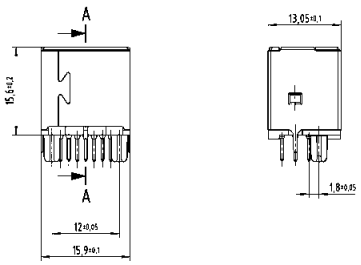
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **HARTING PushPull Signal** | | | |
| Insert for panel feed-through HIFF, 10-poles incl. male insert | 09 45 545 9010 |  | |
| Order D-Sub crimp male contacts separately | | | |
| **D-Sub crimp contacts for device side** | | | |
| male, turned AWG 24-20; 0.25-0.52 mm² | 09 67 000 8576[1)] | | |
| male, turned AWG 22-18; 0.33-0.82 mm² | 09 67 000 3576[1)] | | |
| male, stamped AWG 24-20; 0.25-0.56 mm² | 09 67 000 8178[2)] | | |
| **HARTING PushPull** | | | |
| suitable housing, bulkhead mounting, plastic | | | |
| EasyInstall | 09 45 545 0032 |  | |
| Compact | 09 45 545 0028 |  | |
| **HARTING PushPull Signal solder jack angled** | 09 45 545 9011 |  | |
| suitable housings, bulkhead mounting | | | |
| with fixing clip | 09 45 545 0029 | | |
| without fixing clip | 09 45 545 0033 | | |
| **HARTING PushPull Signal solder jack straight** | 09 45 545 9012 |  | |
| suitable housing, bulkhead mounting | 09 45 545 0027 | | |

[1)] To be used with crimp tool 09 99 000 0501. Suitable locator: 09 99 000 0531

[2)] To be used with crimp tool 09 99 000 0175.



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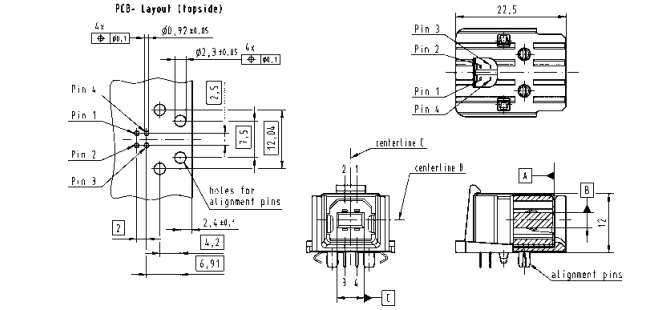
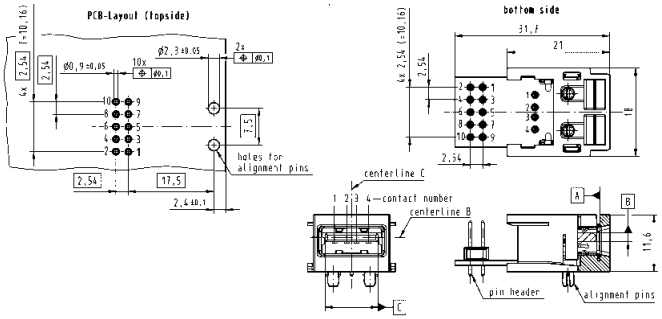
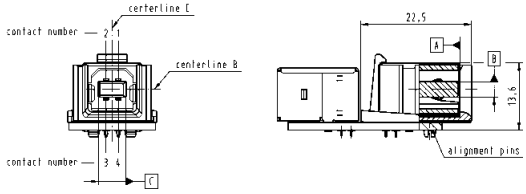
HARTING PushPull USB
Components device side and panel feed-throughs

## Advantages

- HARTING PushPull technology
- Compact, space-saving design for the device integration of USB jacks
- USB 2.0 and 3.0 compatible

## Technical characteristics

| | |
|---|---|
| Mating face | USB 2.0 type B and USB 2.0 / 3.0 type A |
| Number of contacts | USB 2.0: 4 and USB 3.0: 9 |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +70 °C |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| **USB 2.0 type B** | | | |
| Solder jack, angled 90°, THT | 09 45 541 1900 |  | |
| **Adapter PCB USB 2.0 type A** | | | |
| Jack to pin header | 09 45 541 1902 |  | |
| Jack to solder points | 09 45 541 1903 | | |
| **Adapter PCB USB 2.0 type B** | | | |
| Jack to jack | | | |
| Type B-B | 09 45 541 1906 |  | |
| Type B-B, 90° | 09 45 541 1907 | | |
| Type A-B | 09 45 541 1910 | | |

All solder jacks and adapter PCB's are suitable for the HARTING PushPull bulkhead mounting housings 09 45 545 0029 / … 0030 / … 0031 / … 0033 (see page 02.04)



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HARTING PushPull USB
Panel feed-throughs

## Advantages

- HARTING PushPull technology
- Compact, space-saving design for the device integration of USB jacks
- USB 2.0 and 3.0 compatible

## Technical characteristics

| | |
|---|---|
| Mating face | USB 2.0 / 3.0 type A |
| Number of contacts | USB 2.0: 4 and USB 3.0: 9 |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +70 °C |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Panel feed-throughs** | | | |
| **EasyInstall style** | | | |
| USB 2.0 type A<br>2 x jack | 09 45 245 1903 | | |
| USB 3.0 type A<br>2 x jack | 09 45 245 1905 | | |
| **Compact style** | | | |
| USB 2.0 type A<br>2 x jack | 09 45 245 1902 | | |
| USB 3.0 type A<br>2 x jack | 09 45 245 1904 | | |



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# HARTING PushPull USB

HARTING PushPull USB
System cables

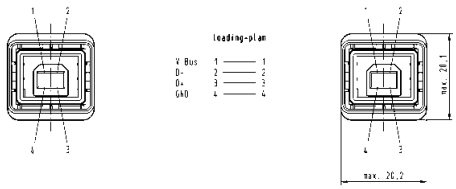
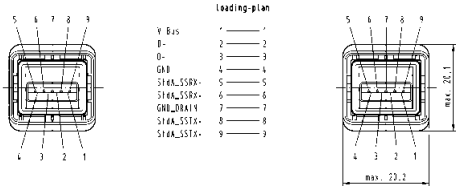
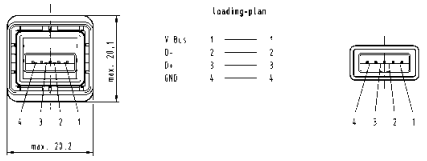
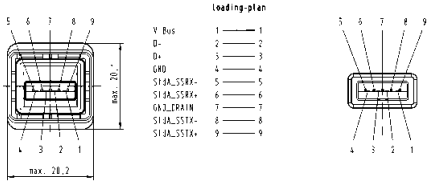


## Advantages

- HARTING PushPull technology
- Compact, space-saving design for the device integration of USB jacks
- USB 2.0 and 3.0 compatible
- Fully shielded, 360° shielding contact
- Robust design, suitable for industrial applications

## Technical characteristics

| | |
|---|---|
| Mating face | USB 2.0 type B and USB 2.0 / 3.0 type A |
| Number of contacts | USB 2.0: 4 and USB 3.0: 9 |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +70 °C |

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **System cables**<br>2 x PushPull USB | | | | |
| USB 2.0 type B-B | Length: 1.5 m<br>5.0 m | 09 45 145 3902<br>09 45 145 3905 |  | |
| USB 2.0 type A-A | Length: 1.5 m<br>5.0 m | 09 45 145 1902<br>09 45 145 1905 | | |
| USB 3.0 type A-A | Length: 1.5 m<br>5.0 m | 09 45 145 2902<br>09 45 145 2905 |  | |
| **System cables**<br>1 x PushPull USB<br>1 x IP20 USB | | | | |
| USB 2.0 type B-B | Length: 1.5 m<br>5.0 m | 09 45 145 3912<br>09 45 145 3915 | | |
| USB 2.0 type A-A | Length: 1.5 m<br>5.0 m | 09 45 145 1912<br>09 45 145 1915 |  | |
| USB 3.0 type A-A | Length: 1.5 m<br>5.0 m | 09 45 145 2912<br>09 45 145 2915 |  | |
| Other types and lengths on request | | | | |



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HARTING offers with the HARTING PushPull Power connector an universal solution for the power supply in compact and robust applications. It is in its element whereever small dimensions are combined with a high protection class.

The connector is available in a 4-pole 48 V and a 2-pole 250 V version. The power contacts can carry up to 12 rsp. 16 A each (see deratings). In spite of this high current carrying capacity the connector gets by with minimal dimensions and fulfils the industrial requirements for clearances and creepage distances at eht same time (pollution degree 3 and overvoltage category III).

Additionally the HARTING PushPull Power connector offers the protection class of IP67 and 65. Beside numerous industrial use cases it is thereby suited for diverse applications in the fields of transportation and telecommunication.

The cable side of the HARTING PushPull Power is terminated with crimping technology. For the receptacle several solutions with different termination technologies are offered.

**Regulations**

- VDE 0110
- DIN EN 61 984

**Advantages**

- Minimum space requirements in spite of high current carrying capacity
- Very compact housing in a high protection class
- Protection against contact on plug AND receptacle side enables an easy and safe installation
- For low voltage (48 V) and for power supply (250 V) available
- Codeable without losing contacts
- Different termination technologies for individual device integration

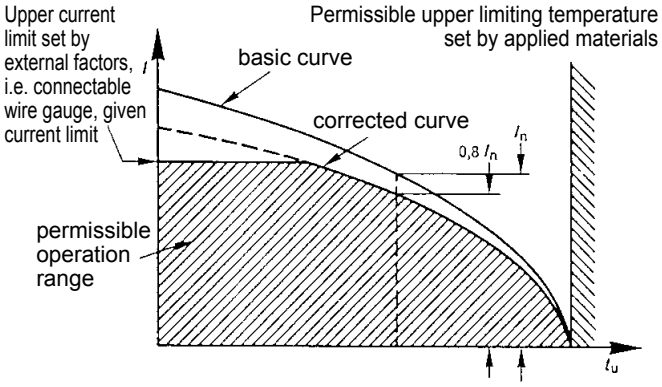
**Typical application areas**

- Factory and building automation
- Industrial electronics
- Telecommunication and wireless networks
- Transportation
- Industrial monitoring and camera systems
- Lighting and display technology
- Access control systems

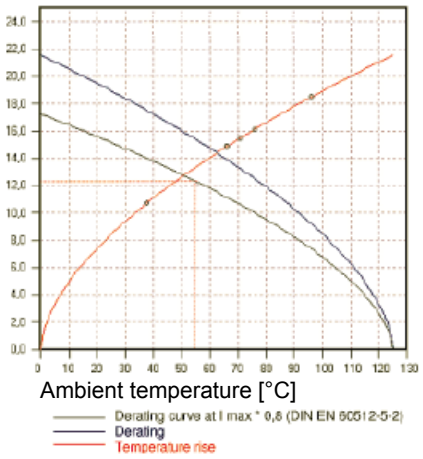
Current carrying capacity

The current carrying capacity is determined in tests which are conducted on the basis of the DIN IEC 60 512-5-2. The current carrying capacity in limited by the thermal properties of materials which are used for inserts as well as by the insulating materials. These components have a limiting temperature which should not be exceeded.

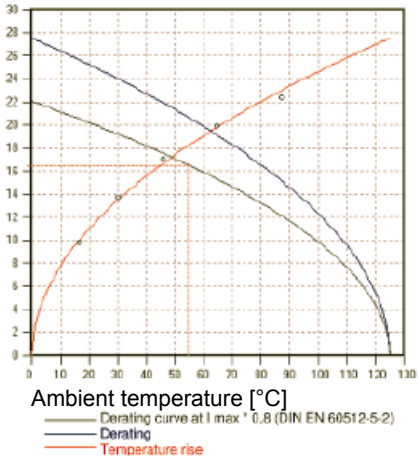
Example of a current capacity curve




Derating-Diagram for low voltage, 48 V; 4x 12 A




Derating-Diagram for power supply, 250 V; 2x 16 A



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HARTING PushPull Power 4/0, type acc. to IEC 61 076-3-106 variant 4
panel feed-throughs 4-poles 48 V / 12 A

## Advantages

- Power connectors for devices
- EasyInstall and Compact panel feed-through and females for simple device integration
- Compact, space-saving design
- Touch-proof according to IEC DIN EN 60 529
- Polarisation with nose
- Device side: female with cable cage, crimp or solder termination
- 4 different coding variants without loss of contact

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61 076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 |
| Electrical data<br>acc. to EN 61 984 | 12 A 48 V 1.5 kV 3 |
| Termination<br>Termination cross section | Crimp<br>0.75 - 2.5 mm²<br>(AWG 20 - 12) stranded |
| Termination<br>Termination diameter | Solder pins<br>1.6 mm |
| Termination<br>Termination cross section | Cable cage<br>0.75 - 2.5 mm²<br>(AWG 20 - 12) stranded |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Panel feed-through set** | | | |
| **Housing** bulkhead mounting **EasyInstall** | | | |
| with 4 turned female contacts and insulation body | | | |
| with crimp termination for 1.5 mm² | 09 46 245 4430<br>09 46 295 4430[1] | | |
| with solder termination, 90° angled | 09 46 245 4030 | | |
| with cage clamp terminal on pcb | 09 46 245 4031<br>09 46 295 4031[1] | | |
| **Housing** bulkhead mounting **Compact** | | | |
| with 4 turned female contacts and insulation body | | | |
| with crimp termination for 1.5 mm² | 09 46 245 4400 | | |
| with solder termination, 90° angled | 09 46 245 4000 | | |
| with cage clamp terminal on pcb | 09 46 245 4001 | | |
| **Power-female with solder termination** | | | |
| 4-poles, 48 V / 12 A, 90° angled | 09 46 500 4400[2] | | |
| 4-poles, 48 V / 12 A, straight | 09 46 500 4402[3] | | |
| **Power-female with crimp termination** | 09 46 500 4401 | | |

Panel cut outs see page 02.04

[1] Metal version (without contacts)
[2] Suitable housings: 09 45 545 0029 / … 0030 / … 0031
[3] Suitable housing: 09 45 545 0027



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# HARTING PushPull Power

HARTING PushPull Power 4/0, type acc. to IEC 61 076-3-106 variant 4
connector 4-poles 48 V / 12 A

## Advantages

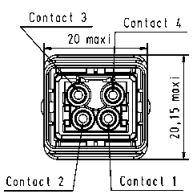
- Power connectors for devices
- EasyInstall panel feed-through for simple device integration
- Compact, space-saving design
- Touch-proof according to IEC DIN EN 60 529
- Polarisation with nose
- Cable side: Male with crimp termination
- 4 different coding variants without loss of contact

## Technical characteristics

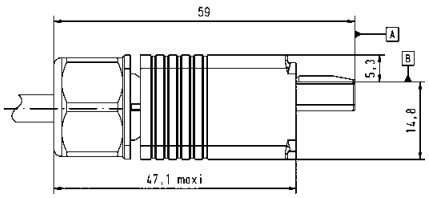
| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61 076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 |
| Electrical data<br>acc. to EN 61 984 | 12 A 48 V 1.5 kV 3 |
| Cable diameter | 4.9 ... 8.6 mm |
| Termination | Crimp |
| Termination cross section | 0.75 - 2.5 mm²<br>(AWG 20 - 12) stranded |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number |
|---|---|
| **Connector set**<br>incl. 4 turned crimp contacts (male) for 1.5 mm², insulation body, housing, cable gland | 09 46 145 4400<br>09 46 195 4400[1)] |
| **Connector set**<br>without contacts | 09 46 145 4401 |
| **Accessories – crimp contacts male** | |
| 0.75 mm² (AWG 20 - 18) | 09 46 500 0403 |
| 1.0 mm² (AWG 18) | 09 46 500 0407 |
| 1.5 mm² (AWG 16 - 14) | 09 46 500 0401 |
| 2.5 mm² (AWG 12) | 09 46 500 0405 |
| **Accessories – crimp contacts female** | |
| 0.75 mm² (AWG 20 - 18) | 09 46 500 0404 |
| 1.0 mm² (AWG 18) | 09 46 500 0408 |
| 1.5 mm² (AWG 16 - 14) | 09 46 500 0402 |
| 2.5 mm² (AWG 12) | 09 46 500 0406 |
| **Accessories – Coding pin set**<br>to avoid accidental incorrect mating a coding system is required.<br>This coding pins are inserted without loss of contact. | 09 46 840 0000 |

Drawing




Dimensions in mm




[1)] Metal version (without contacts)



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HARTING PushPull Power 2/0, type acc. to IEC 61 076-3-106 variant 4
panel feed-through and connector, 3-poles, 250 V / 16 A

## Advantages

- Power connectors for devices
- EasyInstall panel feed-through for simple device integration
- Compact, space-saving design
- Touch-proof according to IEC DIN EN 60 529
- Polarisation with nose
- Cable side: Male with crimp termination
- Device side: female with crimp termination
- 4 different coding variants without loss of contact

## Technical characteristics

| | |
|---|---|
| Locking | PushPull Technology<br>acc. to IEC 61 076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 2 + PE |
| Electrical data<br>acc. to EN 61 984 | 16 A 250 V 4 kV 3 |
| Cable diameter | 4.9 ... 8.6 mm |
| Termination | Crimp |
| Termination cross section | 0.75 - 2.5 mm²<br>(AWG 20 - 12) stranded |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING PushPull Power 2/0 | | | |
| Panel feed-through set<br>incl. 3 turned crimp contacts (female) for 1.5 mm², insulation body (black), housing bulkhead mounting EasyInstall | 09 46 245 3430 | | |
| Panel feed-through set<br>incl. 3 turned contacts (female) for 1.5 mm², insulation body (black), housing bulkhead mounting, with crimp termination | 09 46 245 3410 | | |
| Power-female with solder termination[1)]<br>angled | 09 46 500 3400 | | |
| Power-female with crimp termination<br>without contacts | 09 46 500 3401 | | |
| Connector set<br>incl. 3 turned crimp contacts (male) for 1.5 mm², insulation body (black), housing, cable gland | 09 46 145 3410 | | |
| Connector set<br>without contacts | 09 46 145 3411 | | |
| Coding pin set<br>to avoid accidental incorrect mating a coding system is required. This coding pins are inserted without loss of contact. | 09 46 840 0000 | | |

Crimp contacts see page 02.28
Panel cut outs see page 02.04

[1)] Suitable housings: 09 45 545 0029 / … 0031



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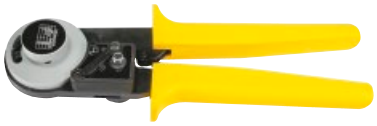
| Identification | Part number | | |
|---|---|---|---|
| HARTING PushPull Power<br>8-indent crimping tool incl. positioner | 09 46 800 0000 |  | For wire gauges<br>0.08 … 4.0 mm²<br>(AWG 28 … 12). |
| Locator HARTING PushPull Power<br>contacts for Buchanan crimping tool<br>(09 99 000 0001) | 09 46 800 0010 | | |
| Insertion tool | 09 46 800 0099 | | For an easy insertion and extraction of the male and female crimp contacts into / out of the insulator body. |
| Extraction tool | 09 46 800 0098 | | |

## Crimp connection

A perfect crimp connection is gastight, therefore corrosion free and amounts to a cold weld of the parts being connected. For this reason, major features in achieving high quality crimp connections are the design of the contact crimping parts and of course the crimping tool itself. Wires to be connected must be carefully matched with the correct size of crimp contacts. If these basic requirements are met, users will be assured of highly reliable connections with low contact resistance and high resistance to corrosive attack.

The economic and technical advantages are:

- Constant contact resistance as a result of precisely repeated crimp connection quality
- Corrosion free connections as a result of cold weld action
- Pre-preparation of cable forms with crimp contacts fitted
- Optimum cost cable connection

Requirements for crimp connectors are laid down in DIN IEC 60 352-2, Amend. 2, as illustrated in the table.

Pull out force of stranded wire

The main criterion to judge the quality of a crimp connection is the retention force achieved by the wire conductor in the terminal section of the contact. DIN IEC 60 352, part 2, defines the extraction force in relation to the cross-section of the conductor. When fitted using HARTING crimping tools and subject to their utilization in an approved manner, our crimp connectors comply with the required extraction forces.

Tensile strength of crimped connections

| Conductor cross-section | | Tensile strength |
|---|---|---|
| mm² | AWG | N |
| 0.08 | 28 | 11 |
| 0.12 | 26 | 15 |
| 0.14 | | 18 |
| 0.22 | 24 | 28 |
| 0.25 | | 32 |
| 0.32 | 22 | 40 |
| 0.5 | 20 | 60 |
| 0.75 | | 85 |
| 0.82 | 18 | 90 |
| 1.0 | | 108 |
| 1.3 | 16 | 135 |
| 1.5 | | 150 |
| 2.1 | 14 | 200 |
| 2.5 | | 230 |
| 3.3 | 12 | 275 |
| 4.0 | | 310 |

Extract from DIN IEC 60 352-2, Amend. 2, Table IV

## Crimping tools

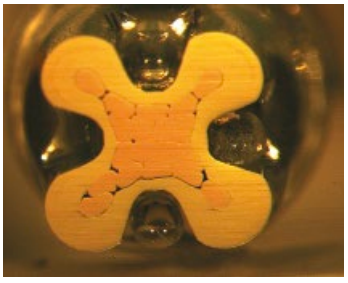
Crimping tools (hand operated or automatic) are carefully designed to produce with high pressure forming parts a symmetrical connection of the crimping part of the contact and the wire being connected with the minimum increase in size at the connection point. The positioner automatically locates the crimp and wire at the correct point in the tool.

A ratchet in the tool performs 2 functions:

① It prevents insertion of the crimp into the tool for crimping before the jaws are fully open

② It prevents the tool being opened before the crimping action is completed

Identical, perfectly formed, connections can be produced using this crimping system.



Crimp-cross section
HARTING crimp profile



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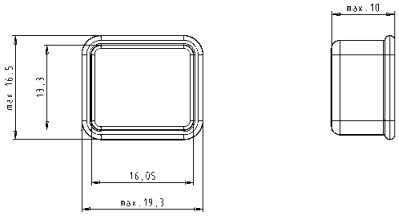
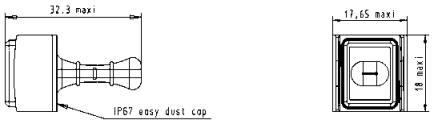
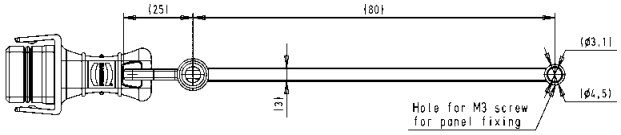
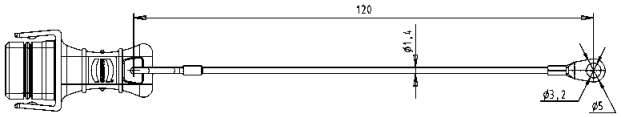
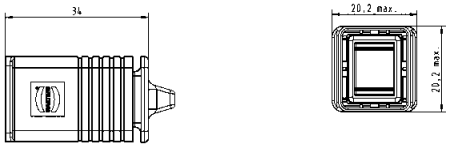
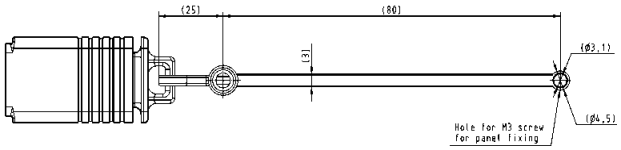
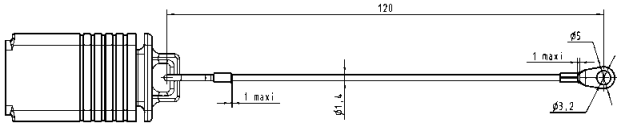
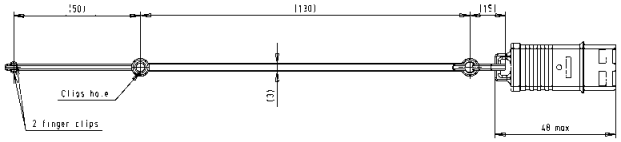
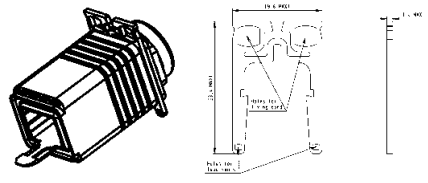
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Transport protecion**<br>for device side<br>IP40 | 09 45 845 0003 |  | |
| **Protection cover**<br>for device side<br>IP65 / IP67 | | | |
| Version with passive locking<br>without cord | 09 45 845 0009 024 |  | |
| Version with passive locking<br>with plastic cord<br>for fixing screw M3 | 09 45 845 0009 |  | |
| Version with passive locking<br>with nylon cord<br>for fixing screw M2.5 / M3 | 09 45 845 0011 024 |  | |
| Version with active locking<br>without cord | 09 45 845 0015 |  | |
| Version with active locking<br>with plastic cord<br>for fixing screw M3 | 09 45 845 0014 |  | |
| Version with active locking<br>with nylon cord<br>for fixing screw M2.5 / M3 | 09 45 845 0013 |  | |
| **Protection cover**<br>for connectors<br>IP65 / IP67 | 09 45 845 0010 |  | |
| **Security clip**<br>for connectors<br>can be sealed and protects against<br>unauthorized unplugging | 09 45 845 0020 |  | |
| **Blinding plate**<br>to close PushPull Compact<br>panel cuttings | 09 45 845 0019 | | |



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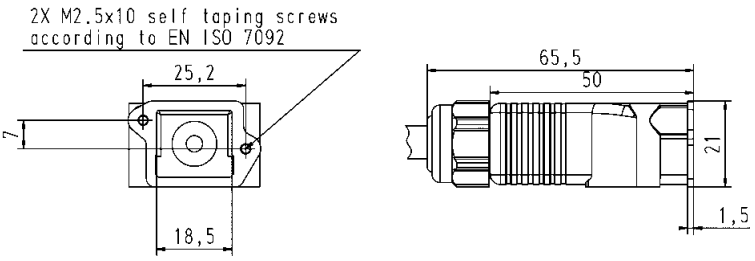
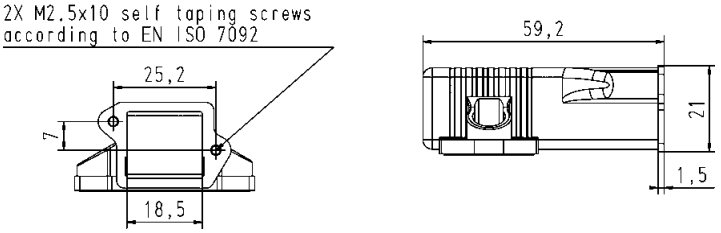
HARTING PushPull, type acc. to IEC 61 076-3-106 variant 4
cable to cable housing

## Features

- HARTING PushPull technology
- Ideal for prototyping
- Can be combined with panel feed-throughs for power, data and signal

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-106 variant 4 |
| Degree of protection | IP65 / IP67 |
| Outer cable diameter | 6.5 … 9.5 mm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **HARTING PushPull cable to cable housings, plastic**<br>(Order housing bulkhead mounting and insert separately) | | | |
| for outer cable diameter 6.5 … 9.5 mm | 09 45 345 0000 |  | |
| **HARTING PushPull bulkhead housings, plastic**<br>(Order housing bulkhead mounting and insert separately) | 09 45 345 0001 |  | |
| **Suitable bulkhead housing, plastic** | | | |
| for RJ45 / Signal | 09 45 545 0028 | | |
| **Inserts for RJ45 / Signal** | | | |
| RJ 45: 8-poles, Cat. 6 / class $E_A$ | | | |
| Ha-Vis preLink® set AWG 22/23 | 20 82 001 0001 | | |
| HARTING RJ Industrial® cable jack with IDC termination | | | |
| AWG 22-24, 8-poles | 09 45 545 1562 | | |
| AWG 24-28, 8-poles | 09 45 545 1561 | | |
| AWG 22-24, 4-poles, Cat. 5 | 09 45 545 1120 | | |
| Signal: 10-poles, 50 V / 5 A* | 09 45 545 9010 | | |

* Order D-Sub crimp male contacts separately (see pages 02.19 and 02.20)



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# Han® PushPull RJ45 Plastic

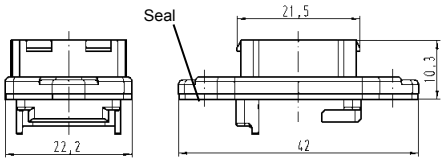
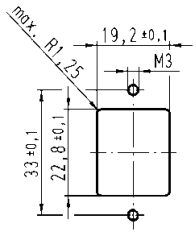
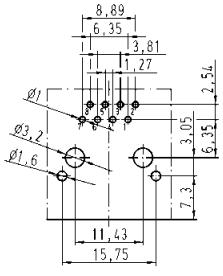
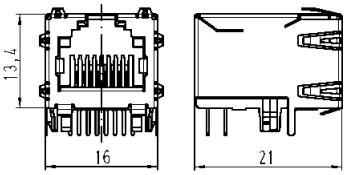
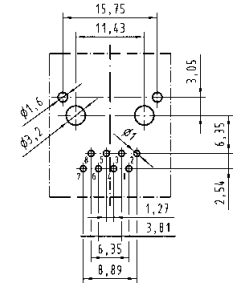
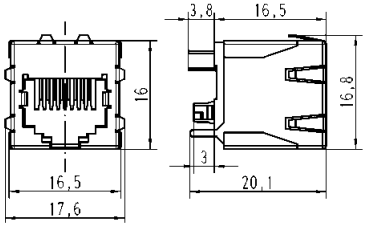
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
Housing bulkhead mounting for device integration and RJ45 jacks

## Features

- HARTING PushPull technology
- Compact design
- High packing density
- Device integration via RJ45 PCB connectors

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology acc. to IEC 61 076-3-117 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Termination type | Jack with solder termination |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Components device side | | | |
| Housing bulkhead mounting plastic | 09 35 002 0321 |  | Panel cut out  |
| Protection cover IP65 / IP67 | 09 35 002 5402 | | PCB layout  |
| RJ45 jack Solder variant, 90° angled | 09 35 002 2101[1)] |  |  |
| Solder variant, 180° straight | 09 35 002 2102[2)] |  | |

1) Packaging: Blister à 90 pieces
2) Packaging: Blister à 100 pieces



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# Han® PushPull RJ45 Plastic

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 panel feed through

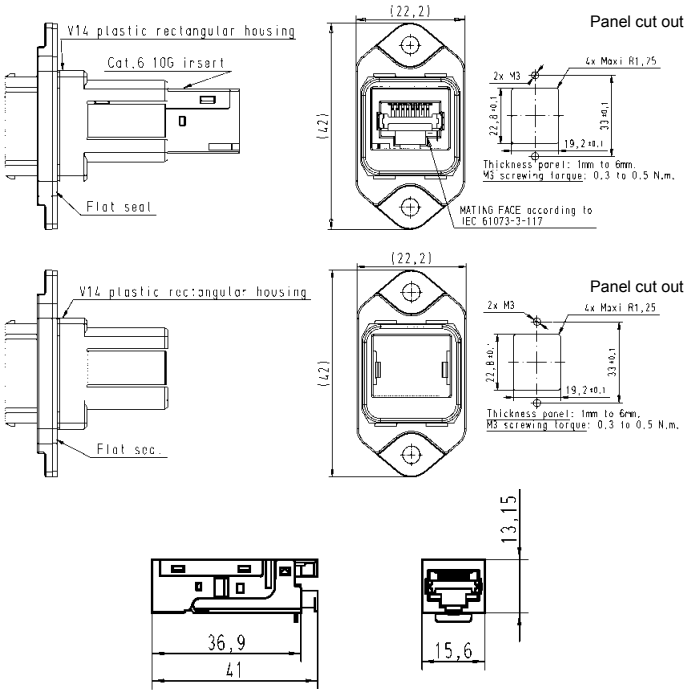
## Features

- HARTING PushPull technology
- Compact design
- High packing density
- Device integration via RJ45 PCB connectors

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology acc. to IEC 61 076-3-117 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Transmission performance | acc. to ISO/IEC 11 801:2002, EN 50 173-1, category 5 / class D up to 100 MHz resp. category 6 / class $E_A$ up to 500 MHz |
| Transmission rate | 10 / 100 Mbit/s and 1 / 10 Gbit/s |
| Number of contacts | 8 |
| Shielding | Fully shielded, 360° shielding contact (Cat. 6) |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull RJ45** | | | |
| Panel feed through Cat. 6 including housing and HARTING RJ Industrial® 10G RJ45 bulkhead | 09 35 225 0331 | | |
| Panel feed through to mount HIFF inserts, e.g. Ha-VIS preLink® RJ45-module Order inserts separately | 09 35 012 0331 | | |
| **Ha-VIS preLink® set RJ45 jack AWG 22/23** | | | |
| consists of: • 1x Ha-VIS preLink® module RJ45 jack • 1x Ha-VIS preLink® terminal module • 1x cable tie | 20 82 001 0001 | | |
| **HARTING RJ Industrial® cable jack IDC** | | | |
| AWG 22-24, 8-poles, Cat. 6 | 09 45 545 1562 | | |
| AWG 24-28, 8-poles, Cat. 6 | 09 45 545 1561 | | |
| AWG 22-24, 4-poles, Cat. 5 | 09 45 545 1120 | | |




Recommendation for female insert and assembly manual on request.



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# Han® PushPull RJ45 Plastic

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 connector

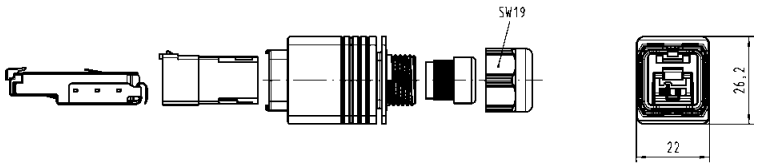
## Features

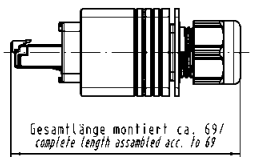
- HARTING PushPull technology
- Field-assembly connector with IDC contacts
- Fully shielded

## Technical characteristics

| | | |
|---|---|---|
| Locking | PushPull technology acc. to IEC 61 076-3-117 | |
| Degree of protection | IP65 / IP67 | |
| Mating face | RJ45 acc. to IEC 60 603-7 | |
| Shielding | Fully shielded, 360° shielding contact | |
| Number of contacts | 4 respectively 8 | |
| Transmission performance | acc. to ISO/IEC 11 801:2002, EN 50 173-1, category 5 / class D up to 100 MHz, category 6 / class $E_A$ up to 500 MHz | |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s | |
| Termination | with IDC contacts, no tools needed / field-assembly | |
| for Cat. 5 | Conductor cross section | AWG 24/7 - 22/7 (stranded)<br>AWG 23/1 - 22/1 (solid) |
| | Cable diameter | 1.6 mm |
| for Cat. 6 | Conductor cross section | AWG 22/7 - 27/7 (stranded)<br>AWG 22/1 - 27/1 (solid) |
| | Cable diameter | 1.6 mm |
| Mating cycles | min. 750 | |
| Temperature range | -40 °C ... +70 °C | |
| Housing material | Plastic, black, UL 94 V0 | |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Connector set, plastic**<br>incl. housing and male insert | | | |
| Han® RJ Industrial<br>Category 5, 4-poles, IDC contacts | | | |
| 6.5 - 9.5 mm clamp range | 09 35 221 0421 | | |
| 5 - 8 mm clamp range | 09 35 222 0421 | | |
| Han® RJ Industrial PN<br>Category 5, 4-poles, IDC contacts | | | |
| 6.5 - 9.5 mm clamp range | 09 35 226 0421 | | |
| PROFINET-Identification:<br>PROFINET O-Plug RJ45 | | | |
| Han® RJ Industrial 10G<br>Category 6, 8-poles, IDC contacts | | | |
| 6.5 - 9.5 mm clamp range | 09 35 225 0421 | | |
| 5 - 8 mm clamp range | 09 35 228 0421 | | |



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# Han® PushPull RJ45 Plastic

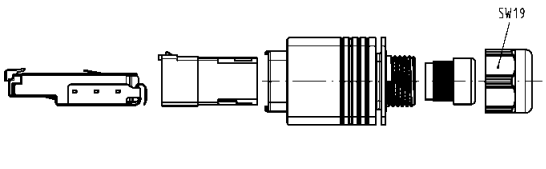
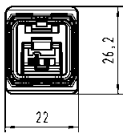
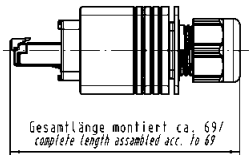
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 connector

## Features

- HARTING PushPull technology
- Field-assembly connector with piercing contacts
- Fully shielded

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology acc. to IEC 61 076-3-117 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Shielding | Fully shielded, 360° shielding contact |
| Number of contacts | 8 |
| Transmission performance | acc. to ISO/IEC 11 801:2002, EN 50 173-1, category $6_A$ / class $E_A$ up to 500 MHz |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Termination | with piercing contacts |
| Conductor cross section | AWG 24/7 - 27/7 (stranded) |
| Cable diameter | 1.05 mm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black, UL 94 V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Connector set, plastic<br>incl. housing and male insert<br>5 - 8 mm clamp range | |   | |
| Han® RJ Industrial Category $6_A$, 8-poles, piercing contacts | 09 35 227 0421 |  | |
| suitable assembly tool | 09 45 800 0520 | | |



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# Han® PushPull RJ45 Metal

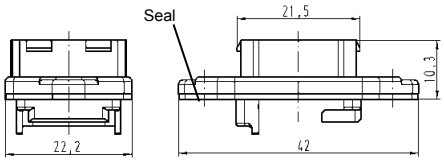
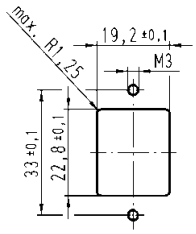
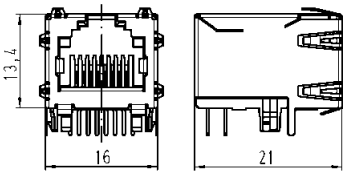
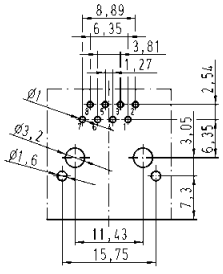
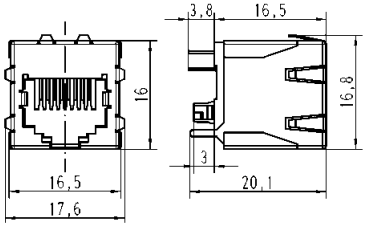
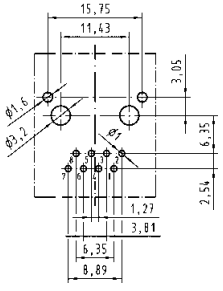
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
Housing bulkhead mounting for device integration and RJ45 jacks

## Features

- HARTING PushPull technology
- Compact design
- High packing density
- Device integration via RJ45 PCB connectors

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology acc. to IEC 61 076-3-117 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Termination type | Jack with solder termination |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| Housing bulkhead mounting metal | 09 35 002 0301 |  | Panel cut out  |
| Protection cover IP65 / IP67 | 09 35 002 5402 | | |
| RJ45 jack Solder variant, 90° angled | 09 35 002 2101[1)] |  | PCB layout  |
| Solder variant, 180° straight | 09 35 002 2102[2)] |  |  |

1) Packaging: Blister à 90 pieces
2) Packaging: Blister à 100 pieces



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# Han® PushPull RJ45 10G Metal

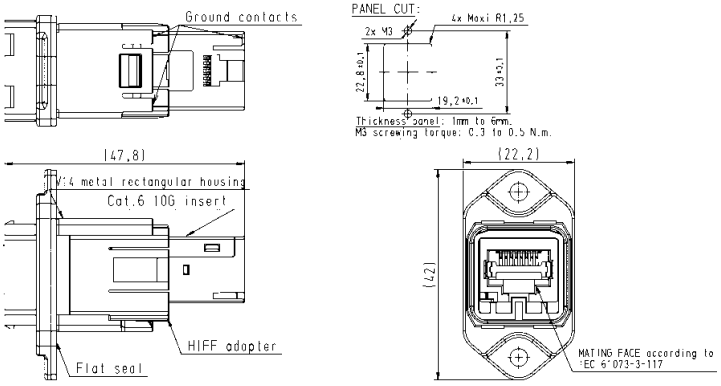
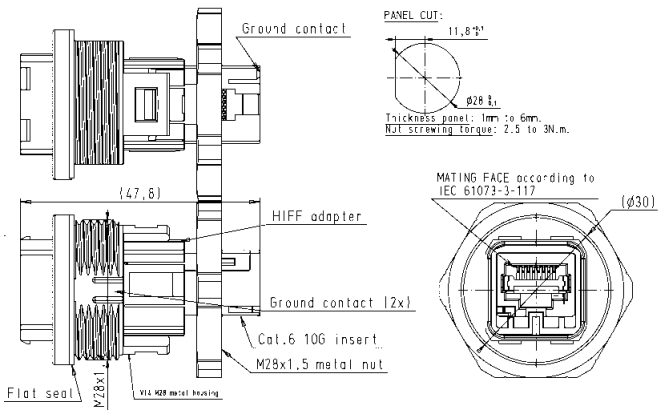
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 10G panel feed through

## Features

- HARTING PushPull technology
- Compact and robust design
- 360° shielding
- RJ45 mating compatible
- Transmission category 6, performance class $E_A$, suitable for 1/10 Gigabit Ethernet
- PROFINET conform

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Transmission performance | Category 6 / class $E_A$ acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | Fully shielded, 360° shielding contact |
| Mounting | Screwable to cover plates |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han® PushPull RJ45 10G | | | |
| Panel feed through, Cat. 6 including bulkhead housing for rectangular panel cut out, flat seal and HARTING RJ Industrial® 10G RJ45 bulkhead, isolated bulkhead fixture | 09 35 225 0311 |  | |
| Panel feed through, Cat. 6 including bulkhead housing for circular panel cut out, flat seal and HARTING RJ Industrial® 10G RJ45 bulkhead, isolated bulkhead fixture | 09 35 225 0312 |  | |



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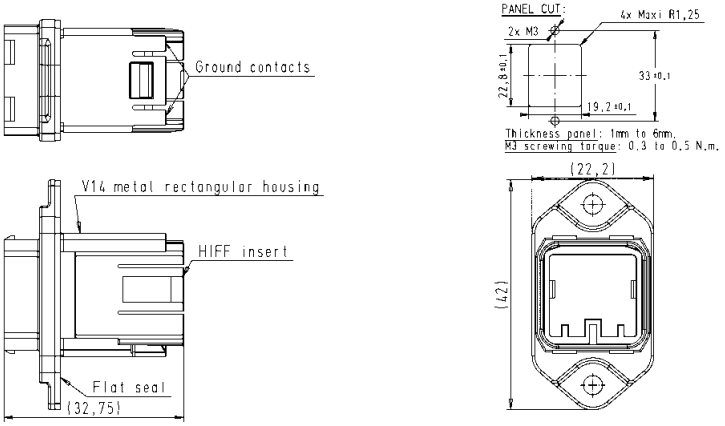
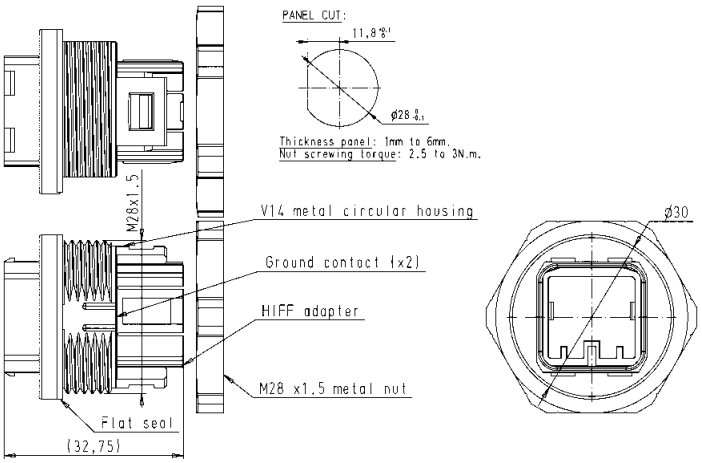
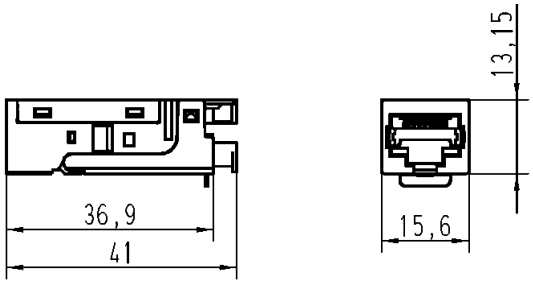
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull RJ45 10G** | | | |
| Panel feed-through<br>to mount HIFF inserts,<br>e.g. Ha-VIS preLink® RJ45-module,<br>RJ Industrial cable jack<br>Order inserts separately | |  | |
| Bulkhead housing for rectangular panel cut out, incl. plastic adapter | 09 35 012 0311 | | |
| Bulkhead housing for circular panel cut out, incl. plastic adapter and fixing nut | 09 35 012 0312 |  | |
| **Ha-VIS preLink® set RJ45 jack AWG 22/23**<br>consists of:<br>• 1x Ha-VIS preLink® module RJ45 jack<br>• 1x Ha-VIS preLink® terminal module<br>• 1x cable tie | 20 82 001 0001 |  | |
| **HARTING RJ Industrial® cable jack IDC** | | | |
| AWG 22-24, 8-poles, Cat. 6 | 09 45 545 1562 | | |
| AWG 24-28, 8-poles, Cat. 6 | 09 45 545 1561 | | |
| AWG 22-24, 4-poles, Cat. 5 | 09 45 545 1120 | | |



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# Han® PushPull RJ45 Metal

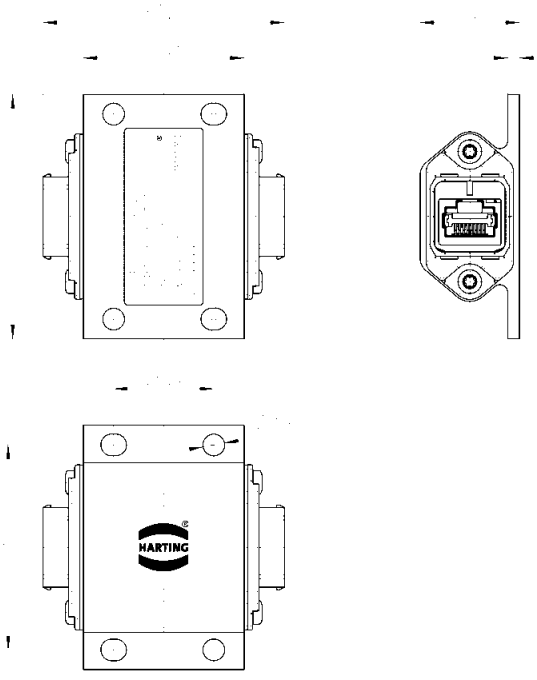
## Han® PushPull RJ45 Genderchanger Metal
## Cat. 6 / Class $E_A$

## Features

- High degree of protection IP65 / IP67
- Robust metal housing
- Standard PROFINET component of the German automotive production
- Allows usage of different cable types (Type B, C) e.g. in robots application
- Extension of cords according to PROFINET guideline
- Can be count as one connection acc. to IEC 11 801 Chapter 10.2.4

## Technical characteristics

| | |
|---|---|
| Transmission performance | Cat. 6 / Class $E_A$ up to 500 MHz |
| Connector | Han® PushPull RJ45 (PROFINET conform) |
| Locking | PushPull technology acc. to IEC 61 076-3-117 variant 14 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Mating cycles | min. 750 |
| Housing material | Aluminium anodized |
| Dimensions | 61.2 x 62 x 25.2 mm (unmated) |
| Degree of protection acc. to DIN 60 529 | IP65 / IP67 (mated) |
| Mounting | Wall mountable with 4 screws (type M5) |
| Temperature range | -40 °C ... +70 °C |
| Maximum permissible humidity | 30 % ... 95 % (no condensation) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han® PushPull RJ45 Genderchanger metal | 09 35 221 0501 |  | |



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# Han® PushPull RJ45 Metal

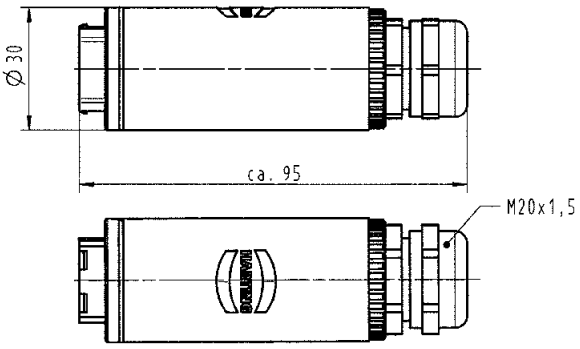
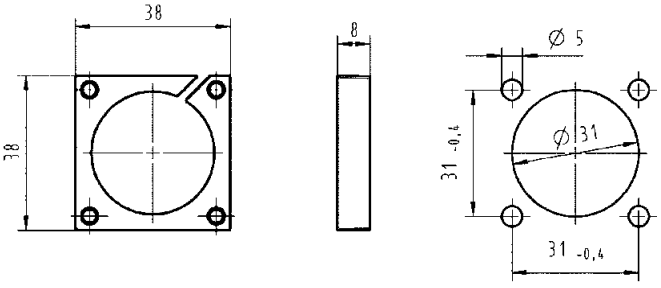
## Han® PushPull RJ45 Coupling Metal
## Cat. 6 / Class $E_A$

## Features

- High degree of protection IP65 / IP67
- Robust metal housing
- Standard PROFINET component of the German automotive production
- Extension of cords according to PROFINET guideline
- Can be count as one connection acc. to IEC 11 801 Chapter 10.2.4
- For an easy robot termination and a fast exchange of tube packages

## Technical characteristics

| | |
|---|---|
| Transmission performance | Cat. 6 / Class $E_A$<br>up to 500 MHz |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117<br>variant 14 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Usable cables | |
| Termination cross section | AWG 22-24 stranded/solid |
| Cable diameter | 5 … 9 mm |
| Conductor diameter | 1.3 … 1.6 mm |
| Mating cycles | min. 750 |
| Housing material | Aluminium die-cast |
| Degree of protection acc. to DIN 60 529 | IP65 / IP67 |
| Temperature range | -40 °C ... +70 °C |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han® PushPull RJ45 Coupling metal<br>including housing, Ha-VIS preLink® RJ45 jack, bulkhead housing and cable gland | 61 04 201 1084 |  | |
| Fixing flange | 61 04 600 0182 |  | |





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# Han® PushPull RJ45 Metal

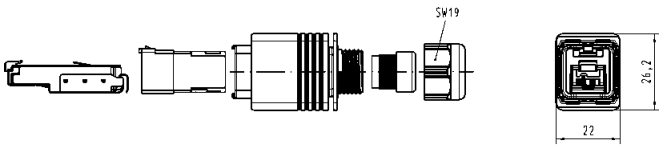
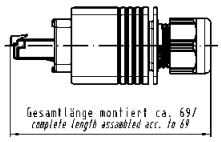
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 connector

## Features

- HARTING PushPull technology
- Field-assembly connector with IDC contacts
- Fully shielded

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology acc. to IEC 61 076-3-117 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Shielding | Fully shielded, 360° shielding contact |
| Number of contacts | 4 respectively 8 |
| Transmission performance | acc. to ISO/IEC 11 801:2002, EN 50 173-1,<br>category 5 / class D up to 100 MHz<br>category 6 / class $E_A$ up to 500 MHz |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Termination | with IDC contacts, no tools needed / field-assembly |
| for Cat. 5 | |
| Conductor cross section | AWG 24/7 - 22/7 (stranded)<br>AWG 23/1 - 22/1 (solid) |
| Cable diameter | 1.6 mm |
| for Cat. 6 | |
| Conductor cross section | AWG 22/7 - 27/7 (stranded)<br>AWG 22/1 - 27/1 (solid) |
| Cable diameter | 1.6 mm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Connector set, metal<br>incl. housing and male insert<br>4 - 11 mm clamp range | | | |
| Han® RJ Industrial<br>Category 5, 4-poles, IDC contacts | 09 35 221 0401 |  | |
| Han® RJ Industrial PN<br>Category 5, 4-poles, IDC contacts<br>PROFINET-Identification:<br>PROFINET O-Plug RJ45 | 09 35 226 0401 |  | |
| Han® RJ Industrial 10G<br>Category 6, 8-poles,<br>IDC contacts | 09 35 225 0401 | | |



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# Han® PushPull RJ45 Metal

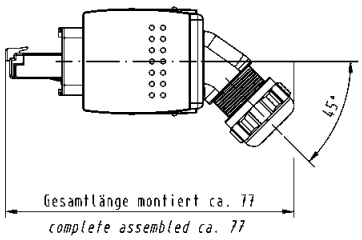
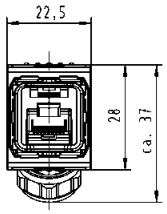
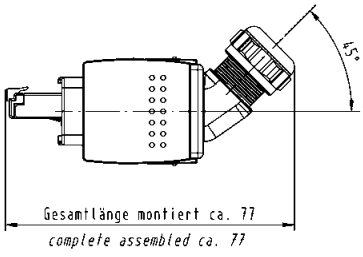
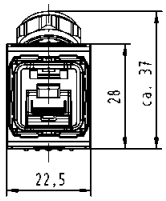
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 connector angled

## Features

- HARTING PushPull technology
- Angled cable exit 45° to the top / bottom for a space saving cabling
- Field-assembly connector with IDC contacts
- Fully shielded

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology acc. to IEC 61 076-3-117 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Shielding | Fully shielded, 360° shielding contact |
| Number of contacts | 4 respectively 8 |
| Transmission performance | acc. to ISO/IEC 11 801:2002, EN 50 173-1,<br>category 5 / class D up to 100 MHz<br>category 6 / class $E_A$ up to 500 MHz |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Termination | with IDC contacts, no tools needed / field-assembly |
| for Cat. 5 | |
| Conductor cross section | AWG 24/7 - 22/7 (stranded)<br>AWG 23/1 - 22/1 (solid) |
| Cable diameter | 1.6 mm |
| for Cat. 6 | |
| Conductor cross section | AWG 22/7 - 27/7 (stranded)<br>AWG 22/1 - 27/1 (solid) |
| Cable diameter | 1.6 mm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Connector set, metal**<br>incl. housing and male insert | | | |
| Han® RJ Industrial PN<br>Category 5, 4-poles, IDC contacts,<br>6.5 - 9.5 mm clamp range | | | |
| Cable exit bottom side | 09 35 226 0402 |  |  |
| Cable exit top side | 09 35 226 0403 | | |
| Han® RJ Industrial 10G<br>Category 6, 8-poles, IDC contacts,<br>6.5 - 9.5 mm clamp range | | | |
| Cable exit bottom side | 09 35 225 0402 |  |  |
| Cable exit top side | 09 35 225 0403 | | |





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# Han® PushPull RJ45 Metal

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 connector

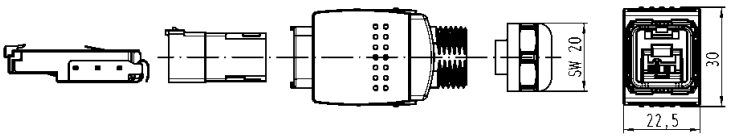
## Features

- HARTING PushPull technology
- Compact design
- For space saving fitting conditions
- Connector with piercing contacts
- 360° shielding

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Shielding | Fully shielded, 360° shielding contact |
| Number of contacts | 8 |
| Transmission performance | acc. to ISO/IEC 11 801:2002,<br>EN 50 173-1,<br>category $6_A$ / class $E_A$<br>up to 500 MHz |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Termination | with piercing contacts |
| Conductor cross section | AWG 24/7 - 27/7 (stranded) |
| Cable diameter | 1.05 mm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Connector set, metal<br>incl. housing<br>and male insert<br>4 - 11 mm clamp range | | | |
| Han® RJ Industrial<br>Category 6, 8-poles,<br>piercing contacts | 09 35 227 0401 | | |
| suitable assembly tool | 09 45 800 0520 | | |



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# Han® PushPull RJ45 Metal

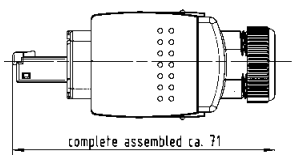
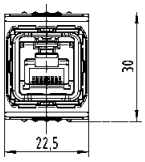
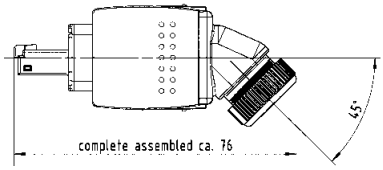
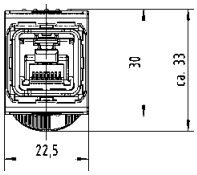
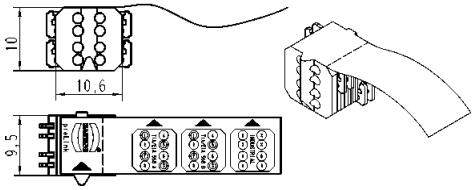
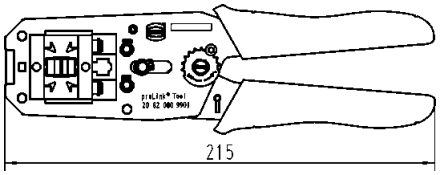
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
preLink® RJ45-connector, straight and angled

## Advantages

- HARTING PushPull technology
- 45° angled cable entry, bottom side, for space saving cabling
- 360° shielding
- Category of transmission Cat. $6_A$
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology acc. to IEC 61 076-3-117 |
| Degree of protection | IP65 / IP67 |
| Mating face | RJ45 acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, Class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Cable termination for preLink® | terminal module, yellow, 20 82 000 0001 |
| Connectable cables | |
| – Conductor cross section | AWG 23 … AWG 22 (solid and stranded) |
| – Conductor diameter | 1.3 … 1.6 mm |
| Cable termination for preLink® | terminal module, white, 20 82 000 0003 |
| Connectable cables | |
| – Conductor cross section | AWG 27 … AWG 26 (solid and stranded) |
| – Conductor diameter | 0.8 … 1.1 mm |
| Cable diameter | 6.3 … 8.8 mm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han® PushPull preLink® RJ45 connector, straight | 20 82 104 0001 |   |   |
| Han® PushPull preLink® RJ45 connector, angled | 20 82 104 0045 |   |   |
| Ha-VIS preLink® RJ45 terminal module | |   | |
| AWG 22/23, yellow[1] | 20 82 000 0001 | | |
| AWG 26/27, white[1] | 20 82 000 0003 | | |
| Ha-VIS preLink® assembly tool | 20 82 000 9901 |   | |

[1] Packaging with 10 pieces





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# Han® PushPull RJ45 Accessories

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
cable to cable housing

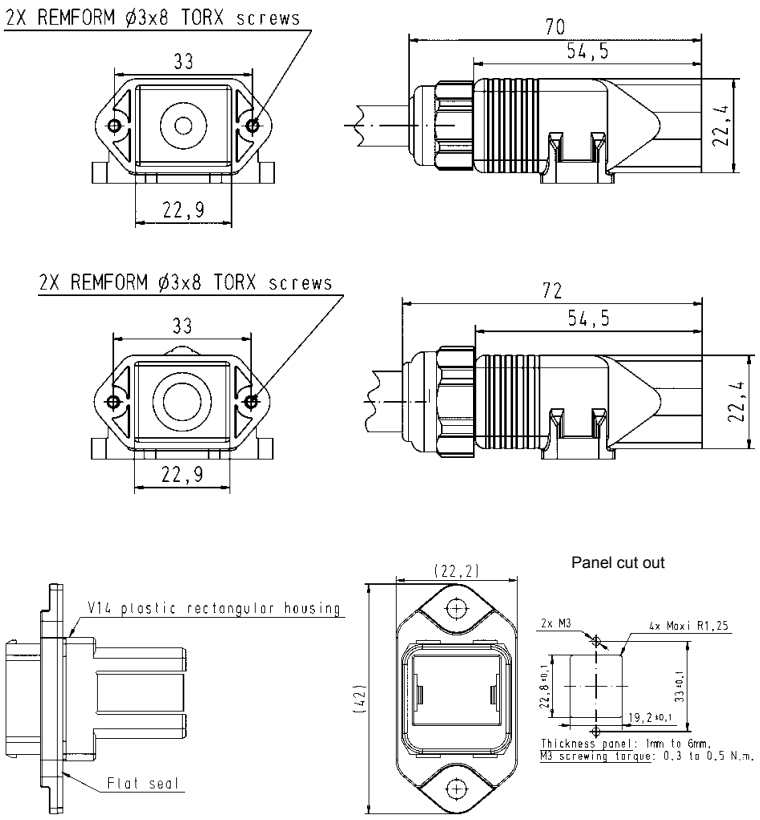
## Features

- HARTING PushPull technology
- Ideal for prototyping
- Can be combined with panel feed-throughs for power, data and signal

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Degree of protection | IP65 / IP67 |
| Outer cable diameter | 6.5 … 9.5 mm / 9 … 13 mm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull cable to cable housings, plastic**<br>(Order housing bulkhead mounting and insert separately) | | | |
| for outer cable diameter 6.5 … 9.5 mm | 09 35 002 0431 | | |
| for outer cable diameter 9 … 13 mm | 09 35 002 0433 | | |
| **Suitable bulkhead housing, plastic** | | | |
| for RJ45 | 09 35 012 0331 | | |
| **Inserts for RJ45** | | | |
| RJ 45: 8-poles, Cat. 6 / class $E_A$ | | | |
| Ha-Vis preLink® set AWG 22/23 | 20 82 001 0001 | | |
| HARTING RJ Industrial® cable jack with IDC termination | | | |
| AWG 22-24, 8-poles | 09 45 545 1562 | | |
| AWG 24-28, 8-poles | 09 45 545 1561 | | |
| AWG 22-24, 4-poles, Cat. 5 | 09 45 545 1120 | | |



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## Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
## Accessories

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull protection cover IP65 / IP67** | | | |
| for device side | | | |
| without fixing cord | 09 35 002 5403 XL[1)] | | |
| with fixing cord | 09 35 002 5402<br>09 35 002 5402 XL[1)] | | |
| with nylon fixing cord | 09 35 002 5404<br>09 35 002 5404 XL[2)] | | |
| **Han® PushPull protection cover IP65 / IP67** | | | |
| for cable side | | | |
| without fixing cord | 09 35 002 5411 | | |
| with nylon fixing cord | 09 35 002 5413 | | |

[1)] Packaging with 100 pieces
[2)] Packaging with 250 pieces



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# Han® PushPull SCRJ Plastic

Han® PushPull, type acc. to IEC 61076-3-117 variant 14
Housing bulkhead mounting for device integration
Optical connector based on SCRJ

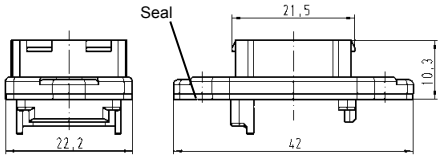
## Features

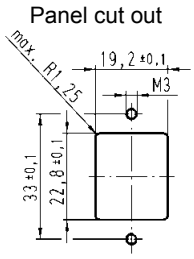
- HARTING PushPull technology
- Compact design
- High packing density
- Device integration via transceiver
- Han® PushPull SCRJ for POF is according the requirements of AIDA (German Domestic Automobile Manufacturers)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Mating face | SCRJ acc. to IEC 61754-24 |
| Fiber Typen | POF[1] 1 mm |
| | HCS®[2] 200 µm / 230 µm |
| | MM 62.5 µm / 125 µm |
| | MM 50 µm / 125 µm |
| | SM 10 µm / 125 µm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| Housing bulkhead mounting<br>Optical transceiver not included | | | |
| plastic | 09 35 002 0323 | | |
| Protection cover IP65 / IP67 | 09 35 002 5402 | | |
| Reference for transceiver as well as mounting instruction on request | | | |






[1] POF = Polymer-Optical Fibre
[2] HCS® = Hard Clad Silica (registered trademark of SpecTran Corporation)

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# Han® PushPull SCRJ Plastic

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 panel feed through
for optical connector based on SCRJ



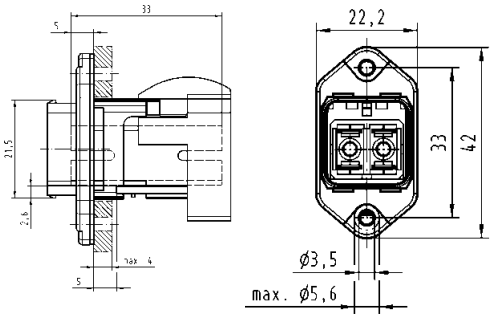
## Features

- HARTING PushPull technology
- Compact design
- High packing density
- Han® PushPull SCRJ for POF is according the requirements of AIDA (German Domestic Automobile Manufacturers)

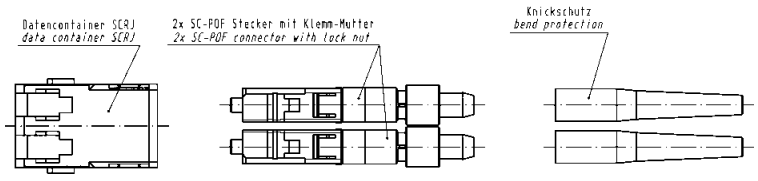
## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Mating face | SCRJ acc. to IEC 61 754-24 |
| Fiber Typen | POF[1] 1 mm |
| | HCS®[2] 200 µm / 230 µm |
| | MM 62.5 µm / 125 µm |
| | MM 50 µm / 125 µm |
| | SM 10 µm / 125 µm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull SCRJ** | | | |
| Panel feed through | 09 35 242 0333 | | |
| SC contacts order separately | | | |
| **SCRJ IP20 POF connector** | | | |
| with fast termination | 09 35 002 4002 | | |
| with crimp termination | 09 35 002 4003 | | |
| **Contacts** | | | |
| SC POF contact, 1 mm | 20 10 001 5217 | | |
| SC 125 GI contact | 20 10 125 5211 | | |
| SC 230 HCS contact | 20 10 230 5211 | | |




Panel cut out






[1] POF = Polymer-Optical Fibre
[2] HCS® = Hard Clad Silica (registered trademark of SpecTran Corporation)

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# Han® PushPull SCRJ Plastic

Han® PushPull, type acc. to IEC 61076-3-117 variant 14
SCRJ connector

## Features

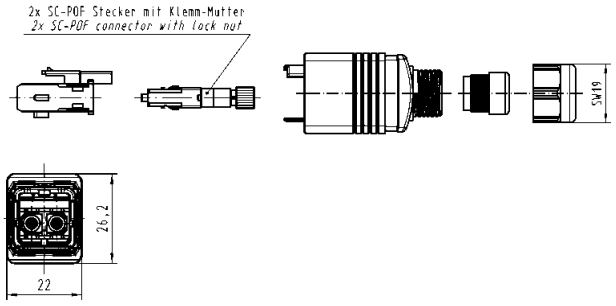
- HARTING PushPull technology
- Compact design
- High packing density
- Han® PushPull SCRJ for POF is according the requirements of AIDA (German Domestic Automobile Manufacturers)
- Field installable

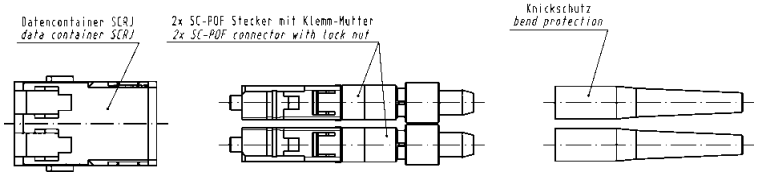
## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Mating face | SCRJ acc. to IEC 61754-24 |
| Fiber Typen | POF[1] 1 mm |
| | HCS®[2] 200 µm / 230 µm |
| | MM 62.5 µm / 125 µm |
| | MM 50 µm / 125 µm |
| | SM 10 µm / 125 µm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |
| Cable diameter | 6.5 - 9.5 mm |

| Identification | Part number |
|---|---|
| **Connector set, plastic**<br>incl. housing and SCRJ insert, POF contacts | |
| PROFINET-Identification: PROFINET O-Plug SCRJ | 09 35 241 0421 |
| incl. housing and SCRJ insert SC contacts order separately | 09 35 241 0422 |
| **SCRJ IP20 POF connector** | 09 35 002 4002 |
| **Protection cover IP65 / IP67** | 09 35 002 5411 |
| **Contacts** | |
| SC POF contact, 1 mm | 20 10 001 5217 |
| SC 125 GI contact | 20 10 125 5211 |
| SC 230 HCS contact | 20 10 230 5211 |

Drawing




Dimensions in mm

Tooling see page 02.57

[1] POF = Polymer-Optical Fibre

[2] HCS® = Hard Clad Silica (registered trademark of SpecTran Corporation)



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# Han® PushPull SCRJ Metal

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
Housing bulkhead mounting for device integration
Optical connector based on SCRJ

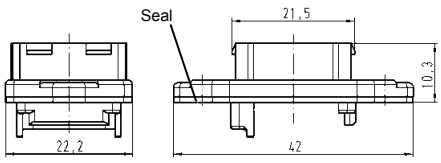
## Features

- HARTING PushPull technology
- Compact design
- High packing density
- Device integration via transceiver
- Han® PushPull SCRJ for POF is according the requirements of AIDA (German Domestic Automobile Manufacturers)

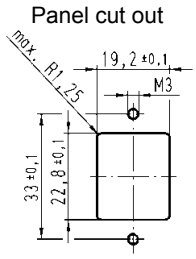
## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Mating face | SCRJ acc. to IEC 61 754-24 |
| Fiber Typen | POF[1] 1 mm |
| | HCS®[2] 200 µm / 230 µm |
| | MM 62.5 µm / 125 µm |
| | MM 50 µm / 125 µm |
| | SM 10 µm / 125 µm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| Housing bulkhead mounting<br>Optical transceiver not included | | | |
| metal | 09 35 002 0303 | | |
| Protection cover IP65 / IP67 | 09 35 002 5402 | | |
| Reference for transceiver as well as mounting instruction on request | | | |




Panel cut out




[1] POF = Polymer-Optical Fibre
[2] HCS® = Hard Clad Silica (registered trademark of SpecTran Corporation)





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# Han® PushPull SCRJ Metal

Han® PushPull, type acc. to IEC 61076-3-117 variant 14
RJ45 panel feed through
for optical connector based on SCRJ

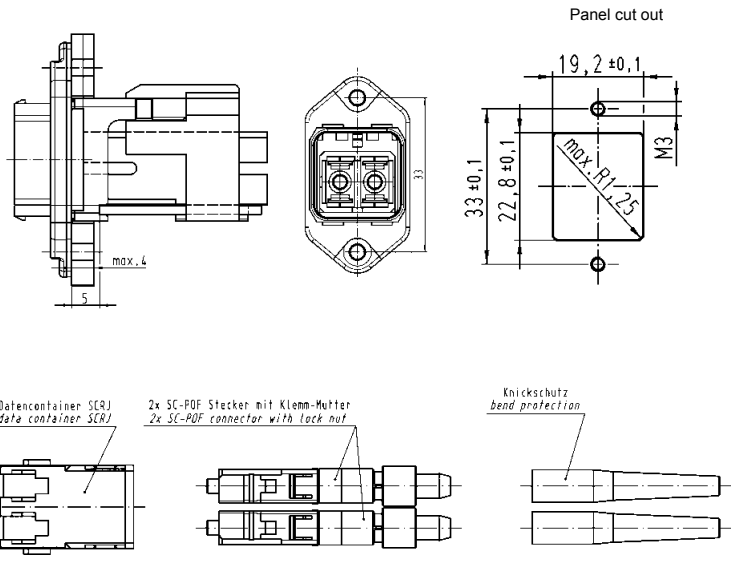
## Features

- HARTING PushPull technology
- Compact design
- High packing density
- Han® PushPull SCRJ for POF is according the requirements of AIDA (German Domestic Automobile Manufacturers)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Mating face | SCRJ acc. to IEC 61754-24 |
| Fiber Typen | POF[1] 1 mm |
| | HCS®[2] 200 µm / 230 µm |
| | MM 62.5 µm / 125 µm |
| | MM 50 µm / 125 µm |
| | SM 10 µm / 125 µm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull SCRJ** | | | |
| Panel feed through | 09 35 242 0313 | | |
| SC contacts order separately | | | |
| **SCRJ IP20 POF connector** | | | |
| with fast termination | 09 35 002 4002 | | |
| with crimp termination | 09 35 002 4003 | | |
| **Contacts** | | | |
| SC POF contact, 1 mm | 20 10 001 5217 | | |
| SC 125 GI contact | 20 10 125 5211 | | |
| SC 230 HCS contact | 20 10 230 5211 | | |




[1] POF = Polymer-Optical Fibre
[2] HCS® = Hard Clad Silica (registered trademark of SpecTran Corporation)



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# Han® PushPull SCRJ Metal

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
SCRJ connector with fast termination

## Features

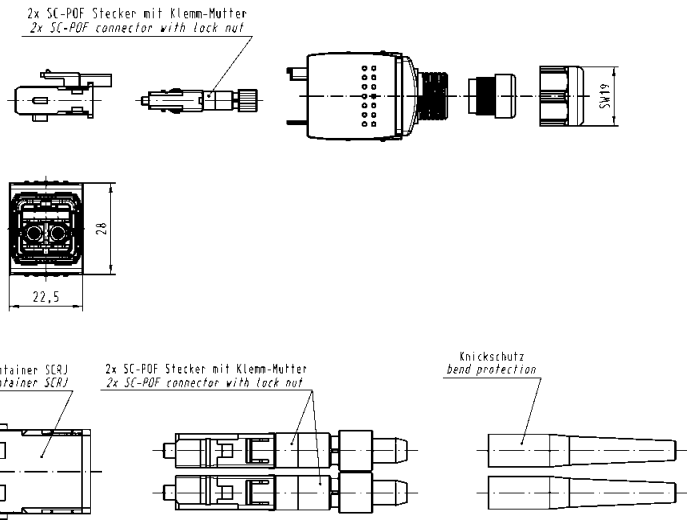
- HARTING PushPull technology
- Compact design
- High packing density
- Han® PushPull SCRJ for POF is according the requirements of AIDA (German Domestic Automobile Manufacturers)
- Field installable

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Mating face | SCRJ acc. to IEC 61 754-24 |
| Fiber Typen | POF[1] 1 mm |
| | HCS®[2] 200 µm / 230 µm |
| | MM 62.5 µm / 125 µm |
| | MM 50 µm / 125 µm |
| | SM 10 µm / 125 µm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel plated |
| Flammability acc. to UL 94 | V0 |
| Cable diameter | 6.5 - 9.5 mm |

| Identification | Part number |
|---|---|
| **Connector set, metal** | |
| incl. housing and SCRJ insert, POF contacts | 09 35 241 0401 |
| PROFINET-Identification: PROFINET O-Plug SCRJ | 09 35 241 0402 |
| incl. housing and SCRJ insert SC contacts order separately | |
| **SCRJ IP20 POF connector** | 09 35 002 4002 |
| **Protection cover IP65 / IP67** | 09 35 002 5411 |
| **Contacts** | |
| SC POF contact, 1 mm | 20 10 001 5217 |
| SC 125 GI contact | 20 10 125 5211 |
| SC 230 HCS contact | 20 10 230 5211 |

Drawing — Dimensions in mm




Tooling see page 02.57

[1] POF = Polymer-Optical Fibre
[2] HCS® = Hard Clad Silica (registered trademark of SpecTran Corporation)



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# Han® PushPull SCRJ Metal

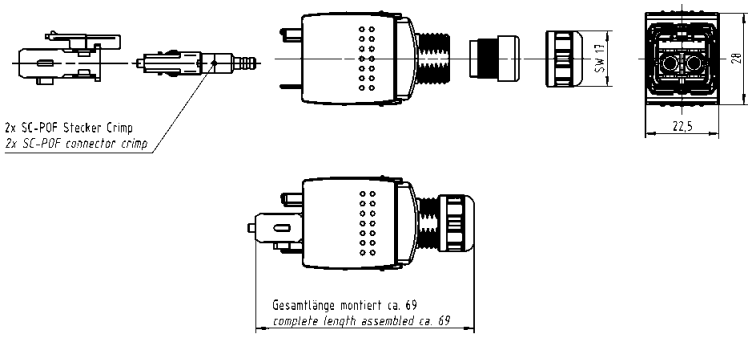
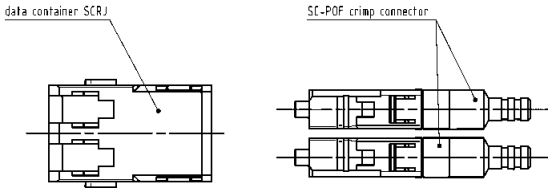
Han® PushPull, type acc. to IEC 61076-3-117 variant 14
SCRJ crimp connector

## Features

- HARTING PushPull technology
- Compact design
- High packing density
- Han® PushPull SCRJ for POF is according the requirements of AIDA (German Domestic Automobile Manufacturers)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Mating face | SCRJ acc. to IEC 61754-24 |
| Fiber Typen | POF[1] 980 µm / 1000 µm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel plated |
| Flammability acc. to UL 94 | V0 |
| Cable diameter | 6.5 - 9.5 mm |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Connector set, metal**<br>incl. housing and SCRJ insert, POF crimp contacts | 09 35 242 0401 |  | |
| **SCRJ IP20**<br>**POF crimp connector** | 09 35 002 4003 |  | |
| **Protection cover**<br>**IP65 / IP67** | 09 35 002 5411 | | |
| **Contacts**<br>SC POF crimp contact | 20 10 001 5211 | | |

Tooling see page 02.56

[1] POF = Polymer-Optical Fibre



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# Han® PushPull SCRJ Metal

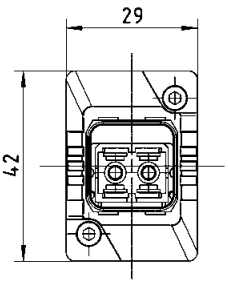
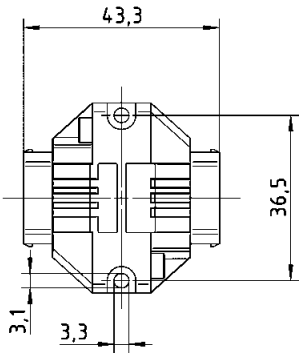
## Han® PushPull SCRJ Genderchanger Metal

## Features

- High degree of protection IP65 / IP67
- Robust metal housing
- Standard PROFINET component of the German automotive production
- Allows usage of different cable types (Type B, C) e.g. in robots application
- Extension of cords according to PROFINET guideline

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 (mated) |
| Mating face | SCRJ acc. to IEC 61 754-24 |
| Fibre types | POF, GOF, HCS |
| Number of contacts | 2 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |
| Dimensions | 43.3 x 42 x 29 mm (unmated) |
| Mounting | Wall mountable with 2 screws (type M3) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han® PushPull SCRJ Genderchanger metal | 09 35 241 0501 |  |  |





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# Han® PushPull SCRJ

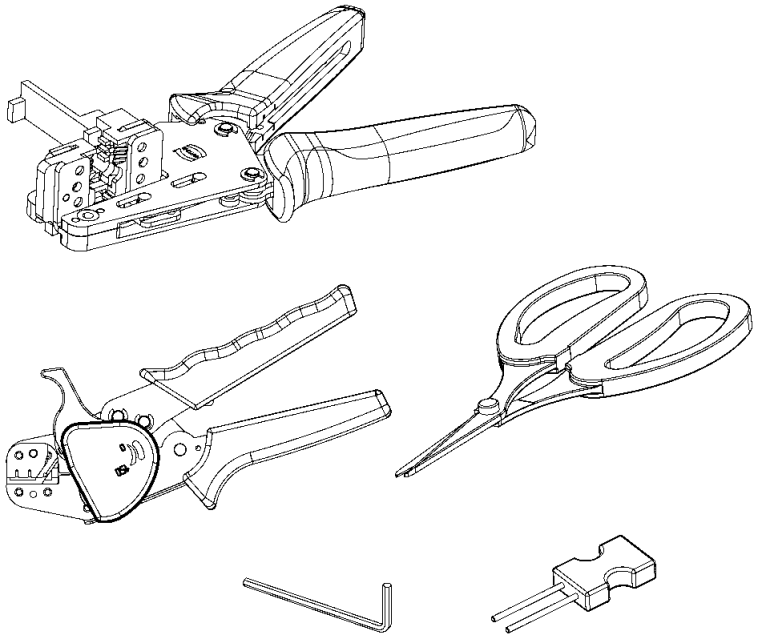
Han® PushPull SCRJ POF crimp
Assembly tools for polymer-optical fibres

## Features

- Cable insulation (PUR / PVC) is stripped without damage
- The ‘crimping’ and ‘precision cutting’ operations are completed within the one tool
- Specialized cutting method with an automatically advancing round blade for an accurate cutting result requiring no final polishing
- Optical display indicating remaining operations
- Simultaneous crimping of two contacts (duplex handling)

## Technical characteristics

| | |
|---|---|
| Connector type | SCRJ crimp connector acc. to IEC 61754-24 |
| Locking | PushPull technology acc. to IEC 61076-3-117 variant 14 (AIDA compliant) |
| Insertion loss | typically 1.5 to 2.0 dB |
| Termination SC contacts | Crimp termination technique |
| Fibre dimensions | POF 980 / 1000 µm |
| Fibre outer diameter | 2.2 mm |
| Cable outer diameter | 7 to 8.5 mm |
| No. of cutting operations | Maximum 1260 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Assembly tool set for POF crimp cutting, without final polishing<br><br>The set contains<br>- one crimpping and cutting tool for 1260 operations<br>- one sheath stripping tool<br>- one Kevlar shear<br>- one loading device for SC contacts<br>Supplied in a robust plastic case | 09 35 000 9915 |  | |
| Replacement cutting tool | 09 35 000 9914 | | |



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# Han® PushPull SCRJ

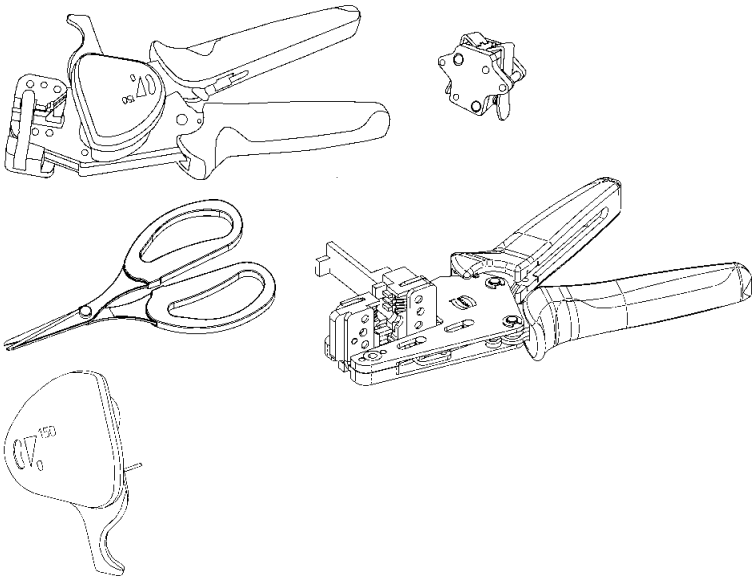
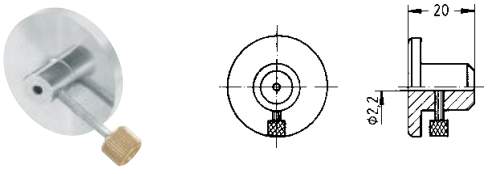
## Han® PushPull SCRJ POF
## Assembly tools for polymer-optical fibres

## Features

- Cable insulation (PUR / PVC) is stripped without damage
- The ‘stripping’ and ‘precision cutting’ operations are completed within the one tool
- Specialized cutting method with an automatically advancing round blade for an accurate cutting result requiring no final polishing
- Optical display indicating remaining operations
- Simultaneous handling of twin fibers (duplex mode)

## Technical characteristics

| | |
|---|---|
| Connector type | SCRJ connector acc. to IEC 61 754-24 |
| Locking | PushPull technology acc. to IEC 61 076-3-117 variant 14 (AIDA compliant) |
| Insertion loss | typically 1.5 to 2.0 dB |
| Termination SC contacts | Fast termination technique, reusable |
| Fibre dimensions | POF 980 / 1000 µm |
| Fibre outer diameter | 2.2 mm |
| Cable outer diameter | 7 to 8.5 mm |
| No. of cutting operations | Maximum 1260 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Assembly tool set for POF cutting, without final polishing**<br>The set contains<br>- one stripping and cutting tool for 1260 operations<br>- one sheath stripping tool<br>- one Kevlar shear<br>- one positioner for SCRJ contacts<br>Supplied in a robust plastic case | 09 35 000 9913 |  | |
| Replacement cutting tool for 1260 operations | 09 35 000 9914 | | |
| **Assembly tool set for POF cutting, with final polishing** | | | |
| Without an optical meter | 20 99 000 3016 | | |
| With an optical meter | 20 99 000 3013 | | |
| **Polishing wheel (grinding wheel) for POF cables 2.2** | 20 99 000 1099 |  | |
| **Sand paper for POF, grain size 1000** | 20 80 001 9911 | | |



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# Han® PushPull Signal

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
10-poles 50 V / 5 A

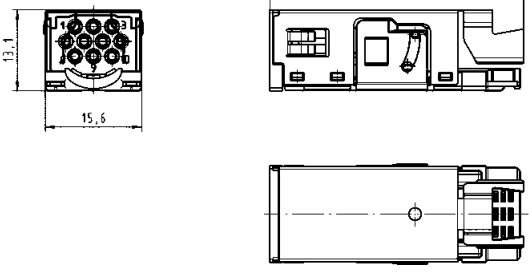
## Features

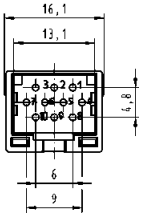
- HARTING PushPull technology
- For the transmission of analog, low voltage and bus signals
- Fully shielded
- 10 contacts
- Touch-proof
- Easy and fast cable installation

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Degree of protection | IP65 / IP67 |
| Mating face | acc. to IEC/PAS 61 076-3-119 |
| Number of contacts | 10 |
| Electrical data<br>acc. to DIN EN 61 984 | 5 A 50 V 1.5 kV 3 |
| Contact resistance | 10 mΩ |
| Termination | Crimp |
| Conductor cross section | AWG 24 … 18; 0.25 … 0.82 mm² |
| Conductor diameter | max. 2.1 mm |
| Outer cable diameter | 6.5 … 9.5 mm / 4 … 11 mm |
| Shielding | Fully shielded, 360° shielding contact |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black<br>Zinc die-cast, nickel-plated |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull Signal Insert** | | | |
| for panel feed-through HIFF, 10-poles<br>incl. male insert | 09 45 545 9010 | | |
| Order D-Sub crimp male contacts separately | | | |
| **D-Sub crimp contacts for device side[3)]** | | | |
| male, turned<br>AWG 24-20; 0.25-0.56 mm² | 09 67 000 8576[1)] | | |
| male, turned<br>AWG 22-18; 0.33-0.82 mm² | 09 67 000 3576[1)] | | |
| male, stamped<br>AWG 24-20; 0.25-0.56 mm² | 09 67 000 8178[2)] | | |




[1)] To be used with crimp tool 09 99 000 0501. Suitable locator: 09 99 000 0531
[2)] To be used with crimp tool 09 99 000 0175.
[3)] For all usable D-Sub contacts please see chapter 05.



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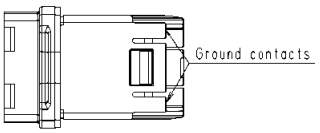
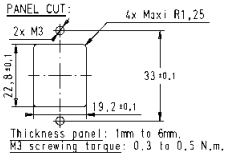
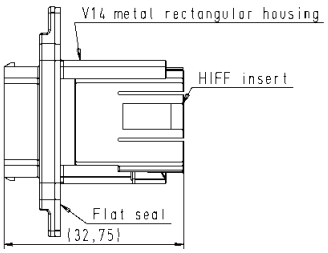
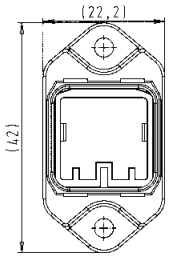
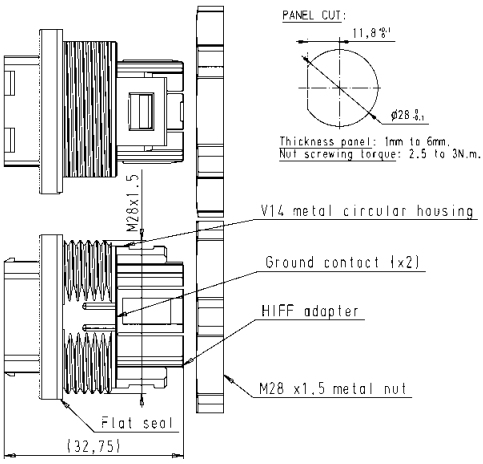
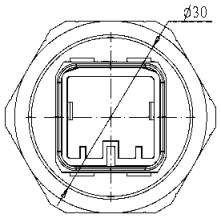
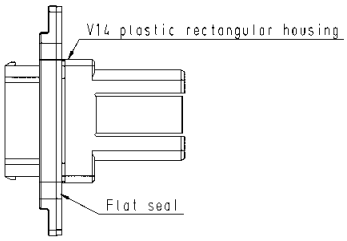
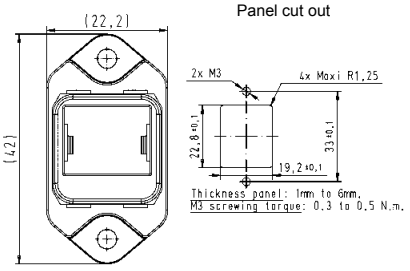
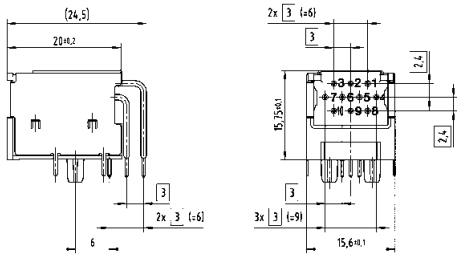
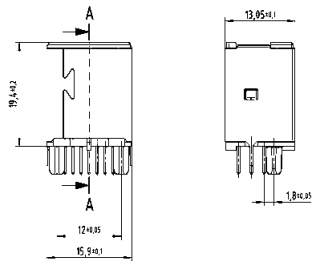
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull panel feed-through HIFF**<br>to hold the 10-poles insert | |  |  |
| Metal rectangular | 09 35 012 0311 |  |  |
| Metal circular | 09 35 012 0312 |  |  |
| Plastic rectangular | 09 35 012 0331 |  | Panel cut out<br>  |
| **Han® PushPull Signal solder jack angled** | 09 35 002 6001 |  | |
| **Han® PushPull Signal solder jack straight**<br>suitable housings, bulkhead mounting | 09 35 002 6002 |  | |
| Metal | 09 35 002 0303 | | |
| Plastic | 09 35 002 0323 | | |



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# Han® PushPull Signal

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
10-poles 50 V / 5 A

## Features

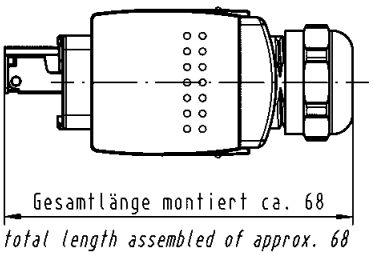
- HARTING PushPull technology
- For the transmission of analog, low voltage and bus signals
- Fully shielded
- 10 contacts
- Touch-proof
- Easy and fast cable installation

## Technical characteristics

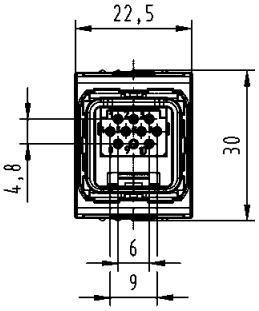
| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Degree of protection | IP65 / IP67 |
| Mating face | acc. to IEC/PAS 61 076-3-119 |
| Number of contacts | 10 |
| Electrical data<br>acc. to DIN EN 61 984 | 5 A 50 V 1.5 kV 3 |
| Contact resistance | 10 mΩ |
| Termination | Crimp |
| Conductor cross section | AWG 24 … 18; 0.25 … 0.82 mm² |
| Conductor diameter | max. 2.1 mm |
| Outer cable diameter | 6.5 … 9.5 mm / 4 … 11 mm |
| Shielding | Fully shielded, 360° shielding contact |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black<br>Zinc die-cast, nickel-plated |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number |
|---|---|
| **Han® PushPull Signal** | |
| Connector set 10-poles<br>incl. metal housing<br>and female insert | |
| 4 … 7 / 7 … 11 mm clamp range | 09 35 261 0401 |
| 7 … 11 mm clamp range | 09 35 262 0401 |
| Connector set 10-poles<br>incl. plastic housing<br>and female insert | |
| 6.5 … 9.5 mm clamp range | 09 35 261 0421 |
| Order D-Sub crimp female contacts separately | |
| **D-Sub crimp contacts for cable side[3)]** | |
| female, turned<br>AWG 24-20; 0.25 - 0.52 mm² | 09 67 000 8476[1)] |
| female, turned<br>AWG 22-18; 0.33 - 0.82 mm² | 09 67 000 3476[1)] |
| female, stamped<br>AWG 24-20; 0.25 - 0.56 mm² | 09 67 000 8278[2)] |

Drawing




Dimensions in mm




[1)] To be used with crimp tool 09 99 000 0501. Suitable locator: 09 99 000 0531
[2)] To be used with crimp tool 09 99 000 0175.
[3)] For all usable D-Sub contacts please see chapter 05.



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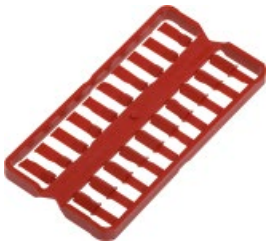
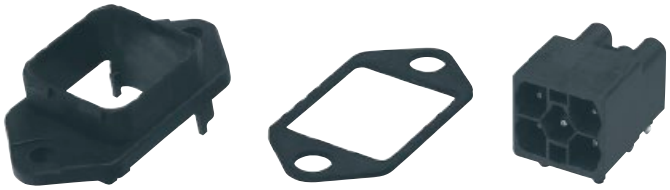
# Han® PushPull Power 4/0 Plastic







Han® PushPull, type acc. to IEC 61 076-3-118
Housing bulkhead mounting and power females for device integration

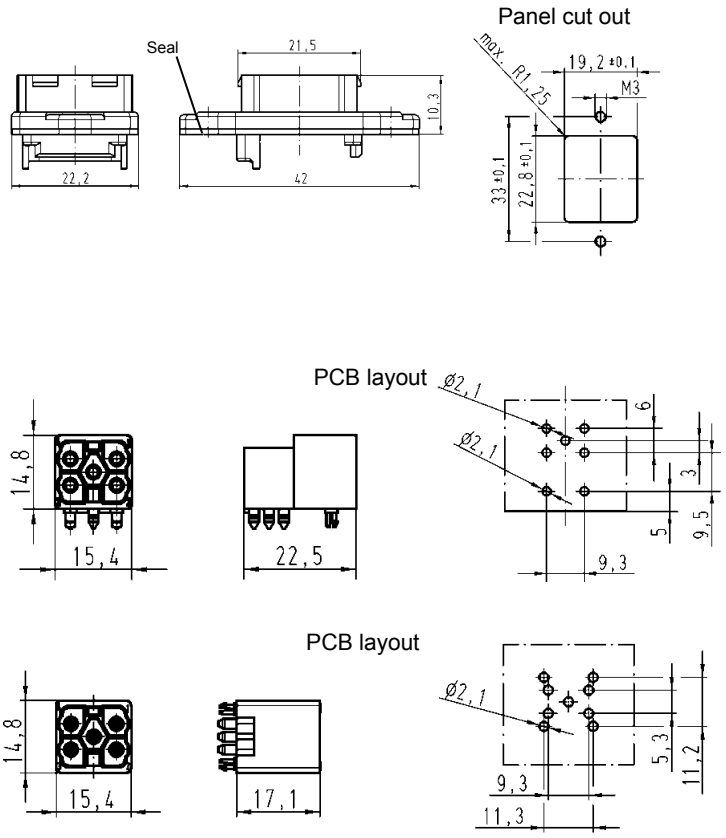
## Features

- HARTING PushPull technology
- Compact, space-saving design
- Touch-proof
- Device side: male
  - Solder variant, angled and straight
- 4 times coding without contact loss

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-118 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data<br>acc. to DIN EN 61 984 | 16 A 230/400 V 4 kV 3 |
| Termination | Male insert with solder termination |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| Housing bulkhead mounting<br>plastic | 09 35 002 0323 | | |
| Protection cover IP65 / IP67 | 09 35 002 5402 | | |
| Coding pins | 09 35 000 6190 | | |
| Male insert<br>with solder termination<br>angled | 09 35 002 3003 | | |
| Male insert<br>with solder termination<br>straight | 09 35 002 3004 | | |



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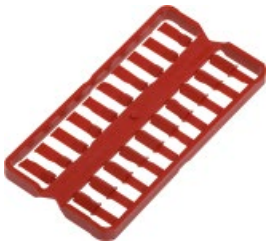
# Han® PushPull Power 4/0 Plastic

Han-Quick Lock®



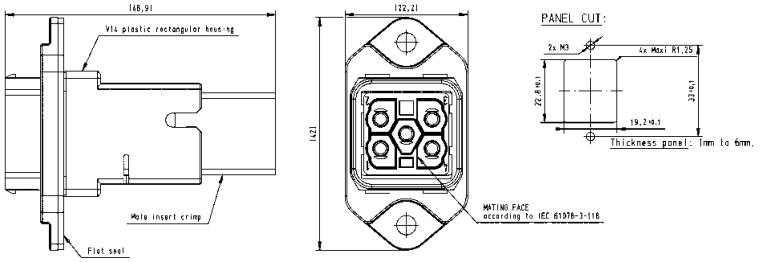
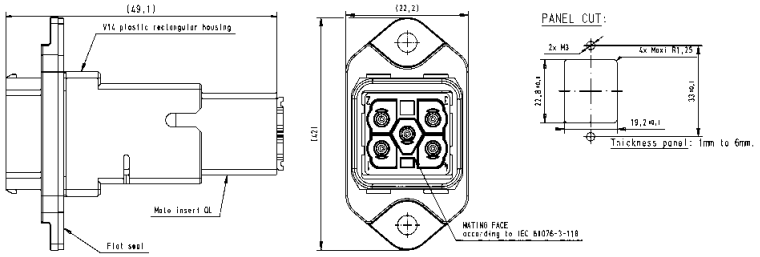
Han® PushPull, type acc. to IEC 61 076-3-118
Panel feed-through, 5-poles, 690 V, 16 A

## Features

- HARTING PushPull technology
- Compact, space-saving design
- Touch-proof
- Panel feed-through: male
  - crimp termination
  - Han-Quick Lock® termination technology
- 4 times coding without contact loss
- NEW: Larger termination cross section for conductors 0.25 - 1.5 mm²

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Mating face | acc. to IEC 61 076-3-118 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data<br>acc. to DIN EN 61 984 | 16 A 690 V 4 kV 3 |
| Termination cross section | 0.25 – 2.5 mm² |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull Power 4/0 Panel feed-through**<br>5-poles, 690 V / 16 A<br>incl. bulkhead housing and male insert | | | |
| with crimp termination (Order crimp male contacts separately) | 09 35 231 0331 |  | |
| with Han-Quick Lock® termination | |  | |
| 0.5 … 2.5 mm² | 09 35 232 0331 | | |
| 0.25 … 1.5 mm² | 09 35 234 0331 | | |
| **Coding element**<br>10 pieces each for device and cable side<br>enables 4 times coding without contact loss | 09 35 000 6190 | | |



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Han® PushPull, type acc. to IEC 61 076-3-118
Panel feed-through, 5-poles, 690 V, 16 A

## Features

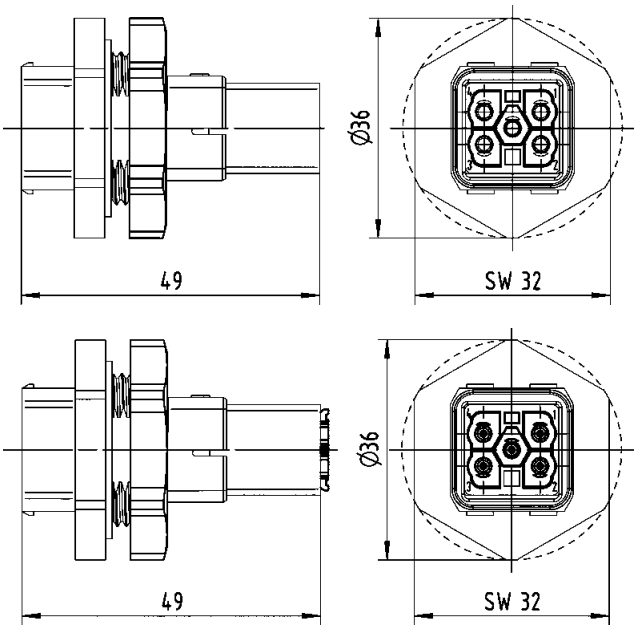
- HARTING PushPull technology
- Compact, space-saving design
- Touch-proof
- Panel feed-through: male
  - crimp termination
  - Han-Quick Lock® termination technology
- 4 times coding without contact loss
- NEW: Larger termination cross section for conductors 0.25 - 1.5 mm²

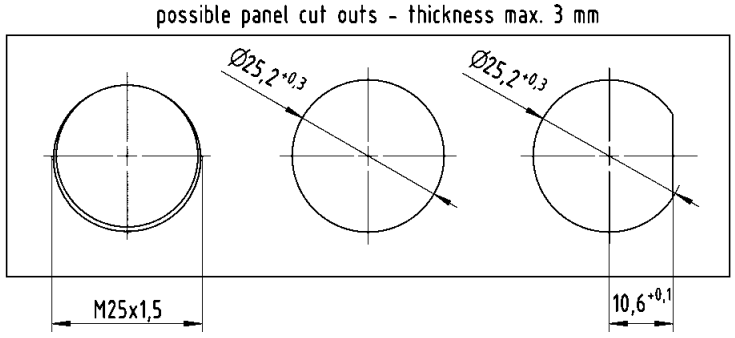
## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Mating face | acc. to IEC 61 076-3-118 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data<br>acc. to DIN EN 61 984 | 16 A 690 V 4 kV 3 |
| Termination cross section | 0.25 – 2.5 mm² |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number |
|---|---|
| **Han® PushPull Power 4/0 Panel feed-through M25**<br>5-poles, 690 V / 16 A<br>incl. bulkhead housing and male insert, circular panel cut out | |
| with crimp termination (Order crimp male contacts separately) | 09 35 231 0332 |
| with Han-Quick Lock® termination | |
| 0.5 … 2.5 mm² | 09 35 232 0332 |
| 0.25 … 1.5 mm² | 09 35 234 0332 |
| **Coding element**<br>10 pieces each for device and cable side<br>enables 4 times coding without contact loss | 09 35 000 6190 |

Drawing — Dimensions in mm





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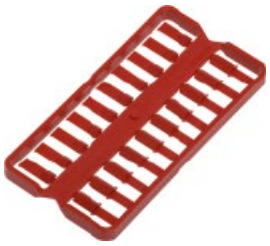
# Han® PushPull Power 4/0 Plastic

Han-Quick Lock®



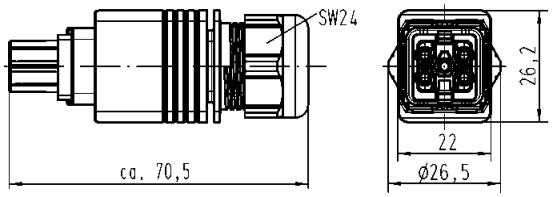
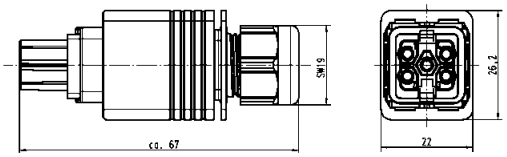
Han® PushPull, type acc. to IEC 61 076-3-118
Connector, 5-poles, 690 V, 16 A

## Features

- HARTING PushPull technology
- Compact, space-saving design
- Touch-proof
- Cable side: female
  - crimp termination
  - Han-Quick Lock® termination technology
    Field-assembly without special tools
- 4 times coding without contact loss
- NEW: Larger termination cross section
  for conductors 0.25 - 1.5 mm²

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Mating face | acc. to IEC 61 076-3-118 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data<br>acc. to DIN EN 61 984 | 16 A 690 V 4 kV 3 |
| Termination cross section | 0.25 – 2.5 mm² |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Connector set, plastic**<br>incl. housing<br>and female insert | | | |
| with crimp termination<br>9 – 13 mm clamp range<br>Han® P crimp contacts<br>order separately | 09 35 231 0423 |  | |
| with Han-Quick Lock® termination<br>9 – 13 mm clamp range<br>for termination cross section 0.5 - 2.5 mm² | 09 35 232 0423 | | |
| with Han-Quick Lock® termination<br>6.5 – 9.5 mm clamp range<br>for termination cross section 0.5 - 2.5 mm²<br>for termination cross section 0.25 - 1.5 mm² | 09 35 232 0421<br>09 35 234 0421 |  | |
| Protection cover IP65 / IP67 | 09 35 002 5411 | | |
| Coding pins | 09 35 000 6190 | | |



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# Han® PushPull Power 4/0 Metal

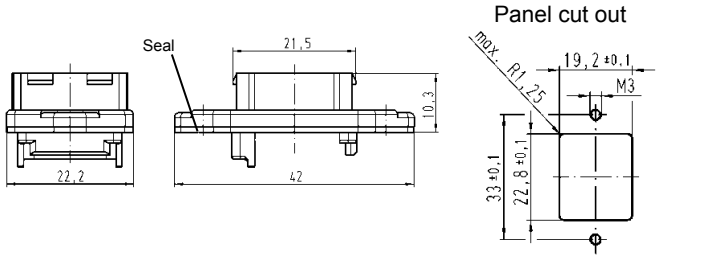
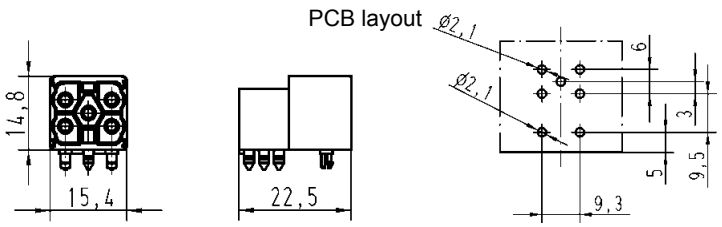
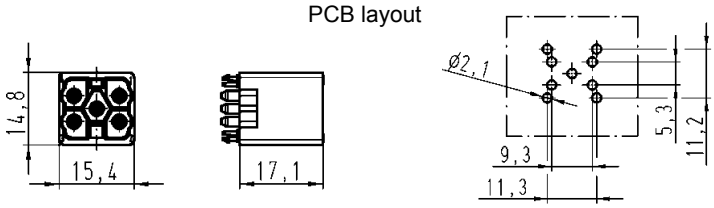
Han® PushPull, type acc. to IEC 61 076-3-118
Housing bulkhead mounting and power females for device integration

## Features

- HARTING PushPull technology
- Compact, space-saving design
- Touch-proof
- Device side: male
  - Solder variant, angled and straight
- 4 times coding without contact loss

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-118 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data<br>acc. to DIN EN 61 984 | 16 A 690 V 4 kV 3 |
| Termination | Male insert with solder termination |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Flammability acc. to UL 94 | V0 |
| Housing material | Zinc die-cast, nickel plated<br>Plastic, black (female) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| Housing bulkhead mounting<br>metal | 09 35 002 0303 |  | |
| Protection cover IP65 / IP67 | 09 35 002 5402 | | |
| Coding pins | 09 35 000 6190 | | |
| Male insert<br>with solder termination<br>angled | 09 35 002 3003 |  | |
| Male insert<br>with solder termination<br>straight | 09 35 002 3004 |  | |



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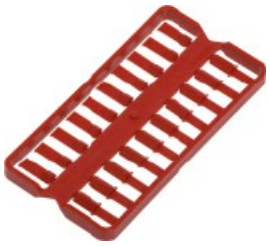
# Han® PushPull Power 4/0 Metal



Han® PushPull, type acc. to IEC 61 076-3-118
Panel feed-through, 5-poles, 690 V, 16 A

## Features

- HARTING PushPull technology
- Compact, space-saving design
- Touch-proof
- Panel feed-through: male
  - crimp termination
  - Han-Quick Lock® termination technology
- 4 times coding without contact loss
- NEW: Larger termination cross section for conductors 0.25 - 1.5 mm²

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Mating face | acc. to IEC 61 076-3-118 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data<br>acc. to DIN EN 61 984 | 16 A 690 V 4 kV 3 |
| Termination cross section | 0.25 – 2.5 mm² |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull Power 4/0 Panel feed-through**<br>5-poles, 690 V / 16 A<br>incl. bulkhead housing and male insert | | | |
| Rectangular panel cut out | | | |
| with crimp termination (Order crimp male contacts separately) | 09 35 231 0311 | | |
| with Han-Quick Lock® termination | | | |
| 0.5 … 2.5 mm² | 09 35 232 0311 | | |
| 0.25 … 1.5 mm² | 09 35 234 0311 | | |
| Circular panel cut out | | | |
| with crimp termination (Order crimp male contacts separately) | 09 35 231 0312 | | |
| with Han-Quick Lock® termination | | | |
| 0.5 … 2.5 mm² | 09 35 232 0312 | | |
| 0.25 … 1.5 mm² | 09 35 234 0312 | | |
| **Coding element**<br>10 pieces each for device and cable side | 09 35 000 6190 | | |
| enables 4 times coding without contact loss | | | |



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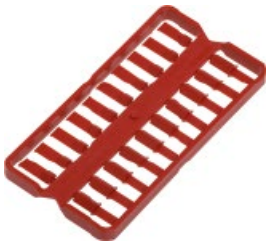
# Han® PushPull Power 4/0 Metal

Han-Quick Lock®



Han® PushPull, type acc. to IEC 61 076-3-118
Connector, 5-poles, 690 V, 16 A

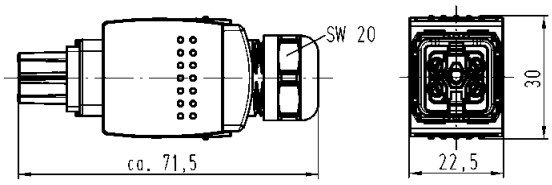
## Features

- HARTING PushPull technology
- Compact, space-saving design
- Touch-proof
- Cable side: female
  - crimp termination
  - Han-Quick Lock® termination technology
    Field-assembly without special tools
- 4 times coding without contact loss
- NEW: Larger termination cross section for conductors 0.25 - 1.5 mm²

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Mating face | acc. to IEC 61 076-3-118 |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data<br>acc. to DIN EN 61 984 | 16 A 690 V 4 kV 3 |
| Termination cross section | 0.25 – 2.5 mm² |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Connector set, metal**<br>incl. housing and female insert | | | |
| with crimp termination<br>4 – 11 mm clamp range<br>Han® P crimp contacts order separately | 09 35 231 0401 | | |
| with Han-Quick Lock® termination<br>4 – 11 mm clamp range | | | |
| for termination cross section 0.5 - 2.5 mm² | 09 35 232 0401 | | |
| for termination cross section 0.25 - 1.5 mm² | 09 35 234 0401 | | |
| Protection cover IP65 / IP67 | 09 35 002 5411 | | |
| Coding pins | 09 35 000 6190 | | |



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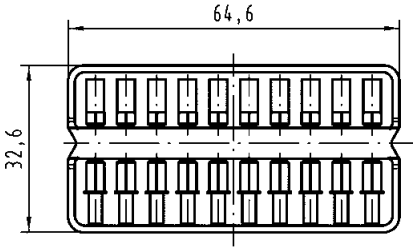
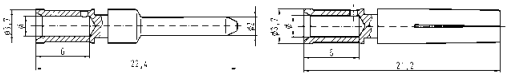
## Han® PushPull, type acc. to IEC 61 076-3-118 variant 14
## Accessories

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Crimping tool | 09 99 000 0888 | | |
| Locator Han P®<br>for crimping tool 09 99 000 0888 | 09 99 000 0886 | | |
| Removal tool Han P® | 09 99 000 0319 | | |
| Coding pins<br>for 4 times coding<br>without contact loss | 09 35 000 6190 |  | |

| Identification | Part number Male contact | Part number Female contact | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Crimp contacts Han® P<br>silver plated | | |  | |
| for 0.5 mm² | 09 35 000 6103 | 09 35 000 6203 | | |
| for 0.75 mm² | 09 35 000 6104 | 09 35 000 6204 | | |
| for 1.0 mm² | 09 35 000 6105 | 09 35 000 6205 | | |
| for 1.5 mm² | 09 35 000 6106 | 09 35 000 6206 | | |
| for 2.5 mm² | 09 35 000 6107 | 09 35 000 6207 | | |

| Wire gauge | | Ø | Stripping length |
|---|---|---|---|
| for 0.5 mm² | AWG 20 | 1.15 mm | 6 mm |
| for 0.75 mm² | AWG 18 | 1.30 mm | 6 mm |
| for 1.0 mm² | AWG 18 | 1.45 mm | 6 mm |
| for 1.5 mm² | AWG 16 | 1.75 mm | 6 mm |
| for 2.5 mm² | AWG 14 | 2.25 mm | 6 mm |



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# Han® PushPull Power 4/0

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
cable to cable housing

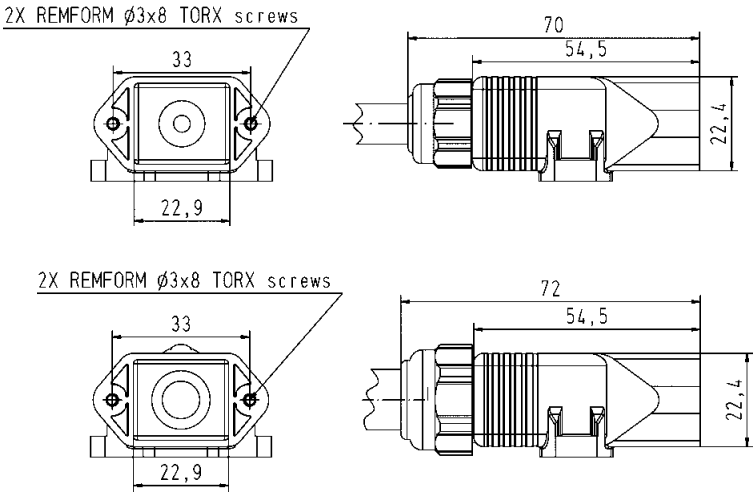
## Features

- HARTING PushPull technology
- Ideal for prototyping
- Can be combined with panel feed-throughs for power, data and signal

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology<br>acc. to IEC 61 076-3-117 variant 14 |
| Degree of protection | IP65 / IP67 |
| Outer cable diameter | 6.5 … 9.5 mm / 9 … 13 mm |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han® PushPull cable to cable housings, plastic**<br>(Order housing bulkhead mounting and insert separately) | | | |
| for outer cable diameter 6.5 … 9.5 mm | 09 35 002 0431 | | |
| for outer cable diameter 9 … 13 mm | 09 35 002 0433 | | |
| **Suitable bulkhead housing, plastic** | | | |
| for power, 5-poles, 690 V / 16 A, incl. housing bulkhead mounting and insert | | | |
| with crimp termination (Order Han® P crimp male contacts separately) | 09 35 231 0331 | | |
| with Han-Quick Lock® termination | | | |
| 0.5 … 2.5 mm² | 09 35 232 0331 | | |
| 0.25 … 1.5 mm² | 09 35 234 0331 | | |
| **Coding element power** | | | |
| 10 pieces each for device and cable side | 09 35 000 6190 | | |



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# Han® PushPull L Power 4/0 Plastic

Housing bulkhead mounting and power females for device integration

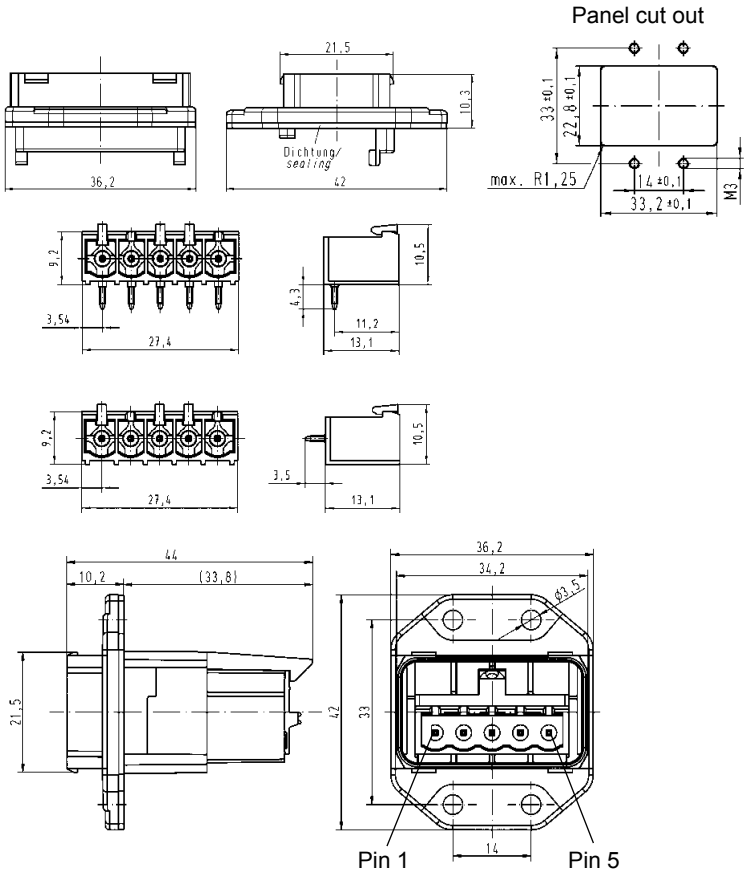
## Features

- HARTING PushPull technology
- Touch-proof
- Device side: male
  - Solder variant, angled and straight
- AIDA-conform
  (German Domestic Automobile Manufactures)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data | |
| acc. to DIN EN 61984 | 16 A 24 V 4 kV 3 |
| Termination | Male insert with solder termination |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| Housing bulkhead mounting plastic | 09 35 004 0321 | | |
| Male insert with solder termination angled | 09 35 004 3003 | | |
| Male insert with solder termination straight | 09 35 004 3004 | | |
| **Panel feed-through, plastic** | | | |
| incl. housing and male insert with spring force connection | 09 35 431 0331 | | |
| Protection cover IP65 / IP67 | 09 35 004 5411 | | |



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# Han® PushPull L Power 4/0 Plastic

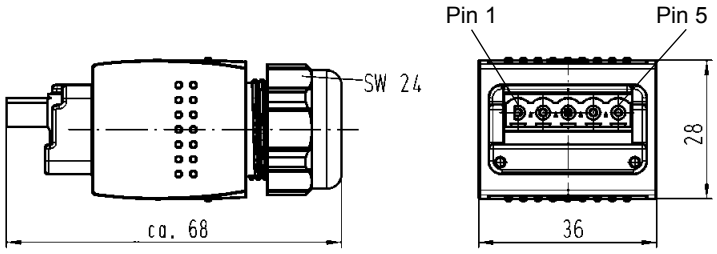
Connector, 5-poles, 24 V, 16 A

## Features

- HARTING PushPull technology
- Touch-proof
- Cable side: female
  - spring force connection
- AIDA-conform
  (German Domestic Automobile Manufactures)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data | |
| acc. to DIN EN 61 984 | 16 A 24 V 4 kV 3 |
| Termination | Spring force connection |
| Termination cross section | 0.75 ... 2.5 mm² |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Cable diameter | 9 – 13 mm |
| Housing material | Plastic, black |
| Flammability acc. to UL 94 | V0 |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Connector set, plastic<br>incl. housing<br>and female insert<br>with spring force connection | 09 35 431 0421 |  | |
| Protection cover IP65 / IP67 | 09 35 002 5411 | | |





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# Han® PushPull L Power 4/0 Metal

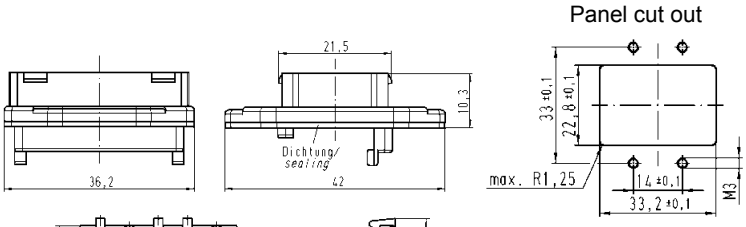
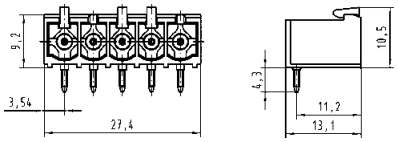
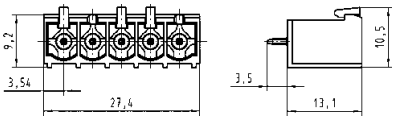
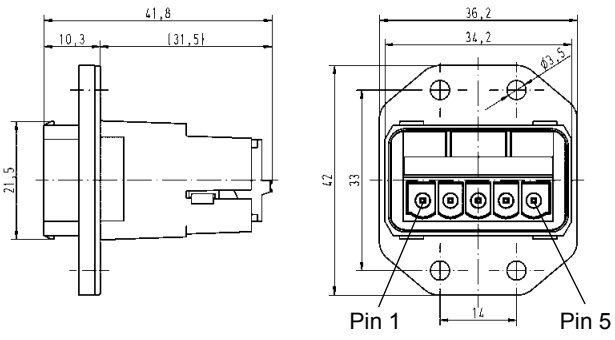
Housing bulkhead mounting and power females for device integration

## Features

- HARTING PushPull technology
- Touch-proof
- Device side: male
  - Solder variant, angled and straight
- AIDA-conform
  (German Domestic Automobile Manufactures)

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data acc. to DIN EN 61984 | 16 A 24 V 4 kV |
| Termination | Male insert with solder termination |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel plated<br>Plastic, black (female) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| Housing bulkhead mounting metal | 09 35 004 0301 |  | |
| Male insert with solder termination angled and with fixed coding | 09 35 004 3003 |  | |
| Male insert with solder termination straight and with fixed coding | 09 35 004 3004 |  | |
| **Panel feed-through, metal** | | | |
| incl. housing and male insert with spring force connection and | | | |
| with fixed coding | 09 35 431 0311 |  | |
| with variable coding | 09 35 431 0313 | | |
| **Protection cover IP65 / IP67** | 09 35 004 5401 | | |



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# Han® PushPull L Power 4/0 Metal

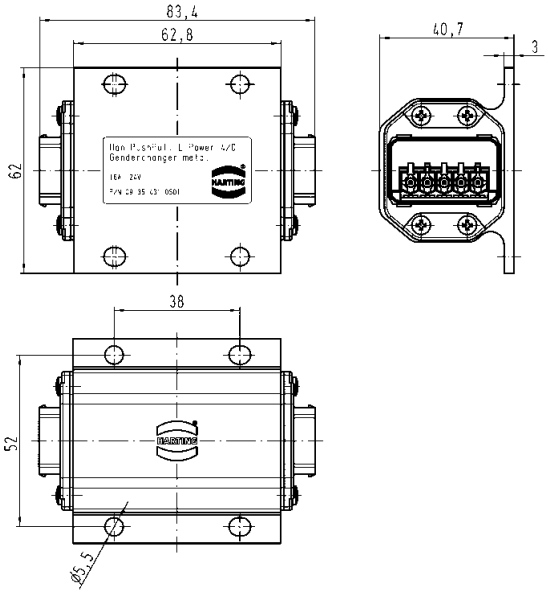
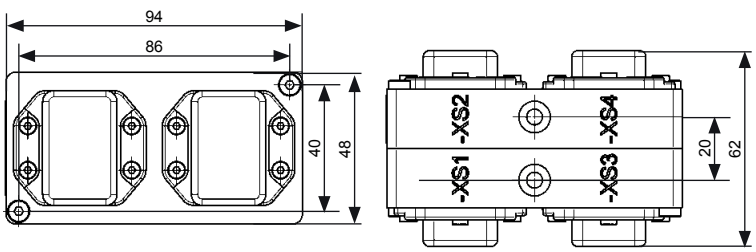
Han® PushPull L Power 4/0 Genderchanger Metal
Han® PushPull L Power 4/0 H-distributor Metal

## Features

- High degree of protection IP65 / IP67
- Robust metal housing
- Standard PROFINET component of the German automotive production
- Allows usage of different cable types (Type B,C) e.g. in robots application
- Extension of cords according to PROFINET guideline
- 4-way-distribution of power signals

## Technical characteristics

| | |
|---|---|
| Connector | Han® PushPull L Power 4/0 |
| Locking | PushPull technology |
| Electrical transmission | 16 A / 24 V |
| Number of contacts | 5 |
| Mating cycles | min. 500 |
| Housing material | Aluminium anodized |
| Dimensions | 83.4 x 62 x 40.7 mm (unmated) |
| Degree of protection acc. to DIN 60529 | IP65 / IP67 (mated) |
| Mounting | Wall mountable with 4 screws (type M5) |
| Temperature range | -20 °C … +50 °C |
| Maximum permissible humidity | 30 % ... 95 % (no condensation) |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han® PushPull L Power 4/0 Genderchanger metal<br>including housing and printed board with 2 x male insert with solder termination | 09 35 431 0501 |  | |
| Han® PushPull L Power 4/0 AIDA H-distributor 4-way metal<br>including housing and printed board with 4 x male insert with solder termination | 61 12 204 0001 |  | |



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# Han® PushPull L Power 4/0 Metal

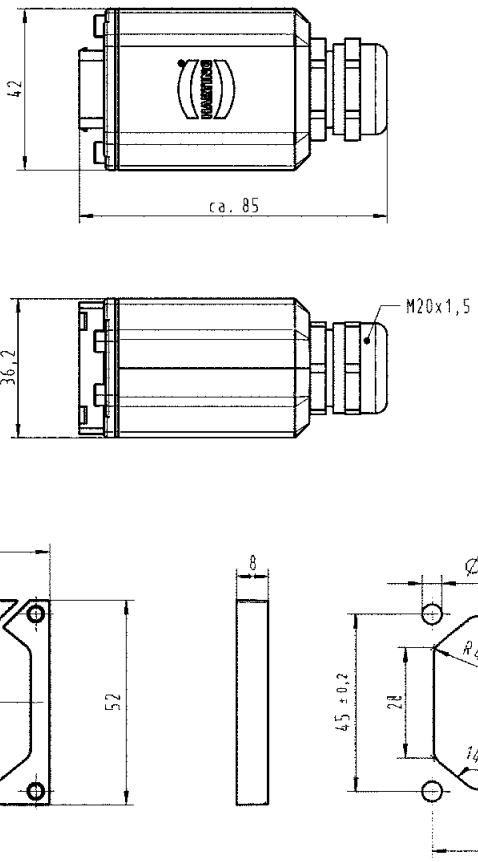
## Han® PushPull L Power 4/0 Coupling Metal

## Features

- High degree of protection IP65 / IP67
- Robust metal housing
- Standard PROFINET component of the German automotive production
- Extension of cords according to PROFINET guideline
- For an easy robot termination and a fast exchange of tube packages

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Electrical transmission | 16 A / 24 V |
| Number of contacts | 5 |
| Mating cycles | min. 500 |
| Housing material | Aluminium die-cast |
| Degree of protection acc. to DIN 60529 | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han® PushPull L Power 4/0 Coupling metal<br>including housing, contact insert Power L, bulkhead housing and cable gland | 61 04 201 1085 |  | |
| Fixing flange | 61 04 600 0183 | | |



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# Han® PushPull L Power 4/0 Metal

Connector, 5-poles, 24 V, 16 A

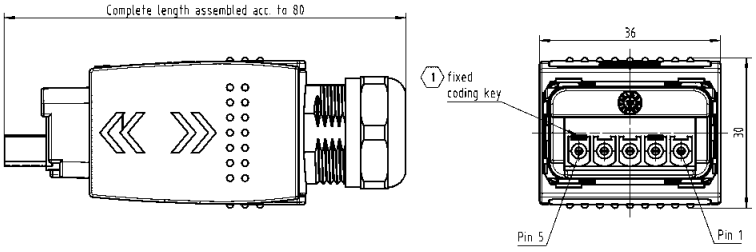
## Features

- HARTING PushPull technology
- Robust design
- Cable side: female
  - spring force connection
- AIDA-conform
  (German Domestic Automobile Manufactures)
- Enlarged size for an optimized connection of 2.5 mm² conductor cross sections

## Technical characteristics

| | |
|---|---|
| Locking | PushPull technology |
| Degree of protection | IP65 / IP67 |
| Number of contacts | 4 + PE |
| Electrical data | |
| acc. to DIN EN 61 984 | 16 A 24 V 4 kV 3 |
| Termination | Spring force connection |
| Termination cross section | 0.75 ... 2.5 mm² |
| Mating cycles | min. 100 |
| Temperature range | -40 °C ... +70 °C |
| Cable diameter | 9 - 13 mm |
| Housing material | Zinc die-cast, nickel plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Connector set, metal**<br>incl. housing<br>and female insert<br>with spring force connection and | | | |
| with fixed coding | | | |
| 9 - 13 mm clamp range | 09 35 433 0401 | | |
| with variable coding | | | |
| 9 - 13 mm clamp range | 09 35 434 0401 | | |
| **Protection cover**<br>IP65 / IP67 | 09 35 002 5411 | | |





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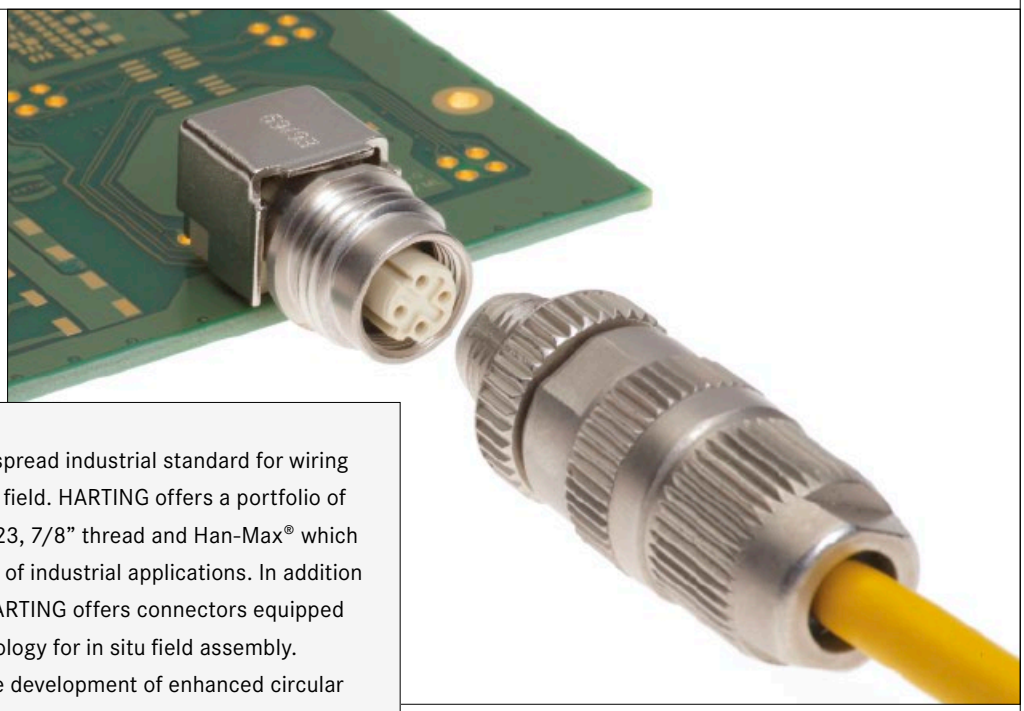
# 03. Circular Connectors



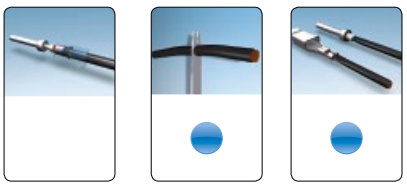
Circular connectors represent a widespread industrial standard for wiring sensors and actuators installed in the field. HARTING offers a portfolio of circular connectors with M8, M12, M 23, 7/8" thread and Han-Max® which are attuned to meet the requirements of industrial applications. In addition to the ready-to-use system cables, HARTING offers connectors equipped with *HARAX*® quick connection technology for in situ field assembly.
In addition, HARTING is continuing the development of enhanced circular connectors for new applications. HARTING is offering the M12 connector for the electrical and optical cabling for Fast Ethernet applications.

*Application profile:*

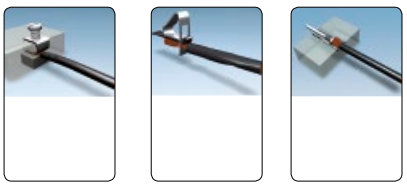
| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| | ● | | ● | ● | ● | | | ● | | |

**Cable termination**

*Han-Quick Lock®* | *IDC HARAX®* | *Crimp*



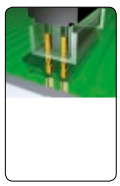
*Screw* | *Cage clamp* | *Axial screw*



**PCB termination**

*THT* | *SMC* | *SMT*

*Press-in*



**Application standard**

DeviceNet | EtherNet/IP | PROFInet | PROFIBUS | CANopen | ETHERNET POWERLINK | EtherCAT Technology Group

**Housing integration**

*Separate housing* | *Integrated housing*

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## Contents


| | Page |
|---|---|
| M8 | **03.08** |
| M12 A coded | **03.20** |
| M12 B coded | **03.58** |
| M12 D coded | **03.80** |
| *har*-speed M12 data connectors X coded | **03.105** |
| M12 PushPull | **03.116** |
| INOX – Solutions for extreme demands | **03.126** |
| M12 with conduit | **03.130** |
| 7/8“ *HARAX*® | **03.132** |
| *HARAX*® panel feed-through | **03.142** |
| Han-Max® | 03.147 |






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Standardized circular connectors with M8, M12, M 23, 7/8“ thread and Han-Max® are in widespread use in the installation of machines and systems.
HARTING offers a portfolio of angled and straight M8, M12, Han® R 23 and 7/8” connectors which are attuned to meet all relevant automation requirements. The housings are available as plastic and as metal variant. In addition to the standard circular connectors for sensors/actuators, HARTING is offering standardized circular connectors such as the M12 and Han-Max® variants to meet the special requirements of communication technology (Ethernet, Ethernet/IP, PROFINET, PROFIBUS, Devicenet and CAN).

The HARTING product range comprises connectors, ready-to-use patch cables and corresponding accessories.

The easy-to-handle *HARAX*® quick connection technology is available for the in situ assembly of M8 and M12 connectors and does not require the use of special tools. The portfolio of circular connectors is rounded off by the Han® R 23 connector family. HARTING’s comprehensive and user-friendly circular connector range enables cost-effective and quick realization of all wiring and communication tasks in automation projects.

## APPLIANCE INTEGRATION:

In order to support the implementation of appliances with degree of protection IP65 / IP67, HARTING offers panel feed-through devices with ready-to use patch cables and female contact modules for direct mounting on PCBs.

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# Special series features



### QUICK CONNECTION WITH *HARAX*®:

The HARTING *HARAX*® quick connection technology is an ideal solution for the in situ assembly of M8/M12 connectors.
Users only have to strip the cable insulation, insert the conductors, and screw the connector together in order to produce a gas-proof and vibration resistant connection.
*HARAX*® is a universal technology deployed in diverse connector series to wire data, signal and power lines and represents the current standard connection for Fieldbus and Fast Ethernet.

### ASSEMBLED SYSTEM CABLES:

HARTING offers a comprehensive range of ready-to-use M8/M12 system cables for the quick wiring of sensors and actuators. HARTING also offers ready-to-use and tested system cables for special Ethernet communication such as PROFINET and Ethernet/IP.
HARTING also provides custom patch cables which are also available as overmoulded versions. The range of solutions comprises shielded and non-shielded cables with diverse structures, as required in drag chain applications, for example.

### M12 FEMALE SOCKETS FOR PCB MOUNTING:

Straight and angled contact inserts are available for direct soldering on PCBs. HARTING has developed special shielded contact inserts category 5 to ISO/IEC 11801 for Ethernet technology which meet the stringent requirements for railway applications.

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# Notes





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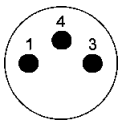
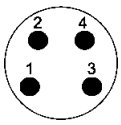
## Specifications

IEC 60 352-4, IEC 61 076-2-104, IEC 61 076-2-101, IEC 61 076-2-109,

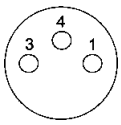
## M8 circular connectors, mating face acc. to IEC 61 076-2-104



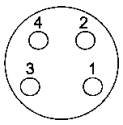
Male, 3 poles



Male, 4 poles



Female, 3 poles

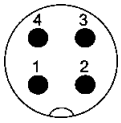


Female, 4 poles

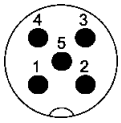
## M12 circular connectors, mating face acc. to IEC 61 076-2-101

### A-coding

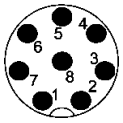
Male, 3 poles



Male, 4 poles

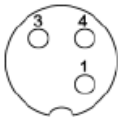


Male, 5 poles

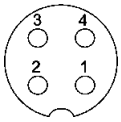


Male, 8 poles

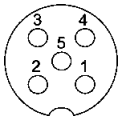
Male, 12 poles



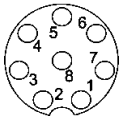
Female, 3 poles



Female, 4 poles



Female, 5 poles

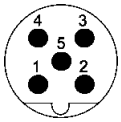


Female, 8 poles

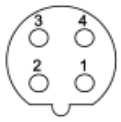
Female, 12 poles

### B-coding

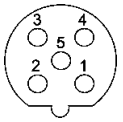
Male, 4 poles



Male, 5 poles

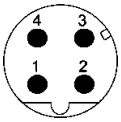


Female, 4 poles

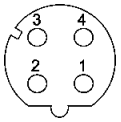


Female, 5 poles

### D-coding

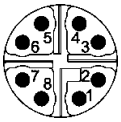


Male, 4 poles



Female, 4 poles

### X-coding, mating face acc. to IEC 61 076-2-109

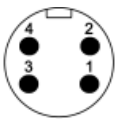


Male, 8 poles

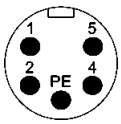
Female, 8 poles

### 7/8“

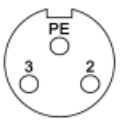
Male, 2 + PE



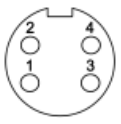
Male, 4 poles



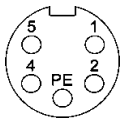
Male, 4 + PE



Female, 2 + PE



Female, 4 poles



Female, 4 + PE



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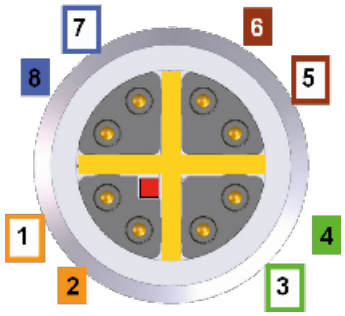
## X-coding, mating face acc. to IEC 61076-2-109



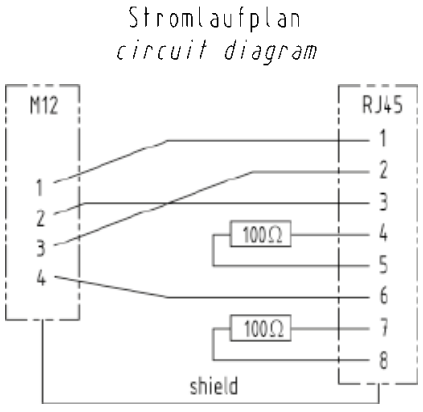

8 poles pin assignment

| Signals | | Pin assignment | | | Cable | | |
|---|---|---|---|---|---|---|---|
| 1/10Gbit | 10/100 Mbit | RJ45 | M12 D-coded | M12 X-coded | 4-wire | 568A | 568B |
| BI_DA+ | TxData+ | 1 | 1 | 1 | yellow | white/green | white/orange |
| BI_DA- | TxData- | 2 | 3 | 2 | orange | green | orange |
| BI_DB+ | RxData+ | 3 | 2 | 3 | white | white/orange | white/green |
| BI_DC+ | - | 4 | - | 8 | | blue | blue |
| BI_DC- | - | 5 | - | 7 | | white/blue | white/blue |
| BI_DB- | RxData- | 6 | 4 | 4 | blue | orange | green |
| BI_DD+ | - | 7 | - | 5 | | white/brown | white/brown |
| BI_DD- | - | 8 | - | 6 | | brown | brown |

## Adapter M12/RJ45

4 poles pin assignment

| 10/100 Mbit | RJ45 | M12 D-coded | 4-wire |
|---|---|---|---|
| TxData+ | 1 | 1 | yellow |
| TxData- | 2 | 3 | orange |
| RxData+ | 3 | 2 | white |
| RxData- | 6 | 4 | blue |



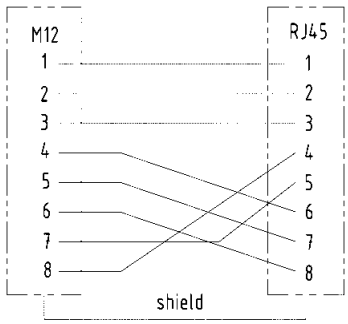
Downloaded from Arrow.com.

## Adapter M12/RJ45

8 poles pin assignment

| M12 | RJ45 |
|---|---|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 6 |
| 5 | 7 |
| 6 | 8 |
| 7 | 5 |
| 8 | 4 |

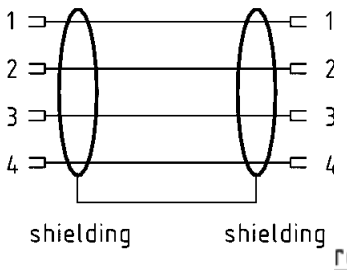
circuit diagram



## Gender changer

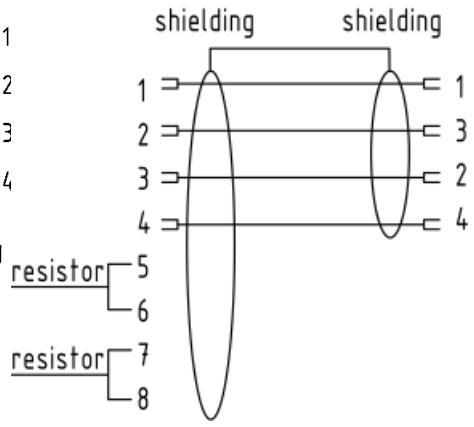
### 4 poles

schematic diagram



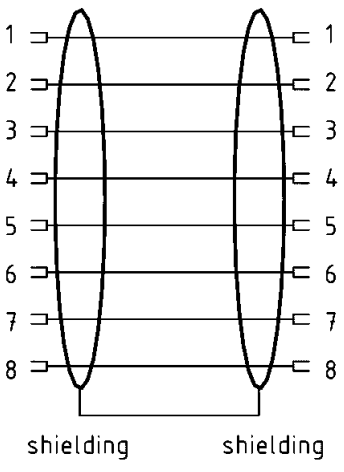

### 4 poles / 8 poles

schematic diagram




### 8 poles

schematic diagram



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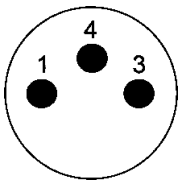
# M8 *HARAX*® cable connector

**Specifications** IEC 60 352-4

**Approval**

Mating face




A-coding
Mating face
acc. to IEC 61 076-2-101



## Technical characteristics M8 *HARAX*®

| Type M8 | *HARAX*® M8-XS | *HARAX*® M8-S |
|---|---|---|
| **General data** | | |
| Conductor cross section | 0.1 - 0.14 mm²<br>AWG 27-26 | 0.14 - 0.34 mm²<br>AWG 26-22 |
| Diameter of individual strands | ≥ 0.05 mm | ≥ 0.1 mm |
| Conductor insulation material | PVC / PP / TPE | PVC / PP / TPE |
| Conductor diameter | 0.6 - 1.0 mm | 1.0 - 1.6 mm |
| Cable diameter | 1.9 - 2.5 mm<br>2.5 - 3.5 mm | 2.5 - 5.1 mm |
| Temperature range | -40 °C … +85 °C | -40 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C | -5 °C … +50 °C |
| Degree of protection | IP67 | IP67 |
| Mating cycles | 100 | 100 |
| Recommended tightening torque / Hexagonal wrench | 0.4 Nm / SW 9 | 0.4 Nm / SW 9 |
| **Electrical characteristics** | | |
| Rated current | 2 A | 4 A |
| Rated voltage | 32 V | 32 V |
| Rated impulse voltage | 1.5 kV | 1.5 kV |
| Contact resistance | 10 mΩ | 10 mΩ |
| Insulation resistance | $10^8$ Ω | $10^8$ Ω |
| Pollution degree | 3 | 3 |
| Overvoltage category | 3 | 3 |
| Isolation group | 1 | 1 |
| **Materials** | | |
| Contact material | Copper alloy | Copper alloy |
| Contact plating | Gold | Gold |
| Contact carrier material | PA | PA |
| Housing material | PA, zinc die-cast | PA, zinc die-cast |



Further information and data sheets see www.HARTING.com

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## Technical characteristics M8

**Current carrying capacity**

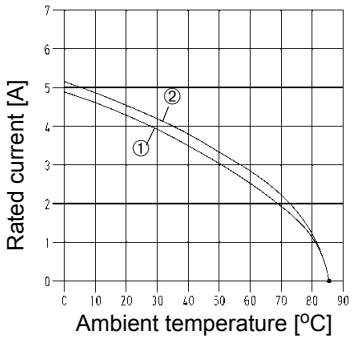
The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interruptet current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512-5.



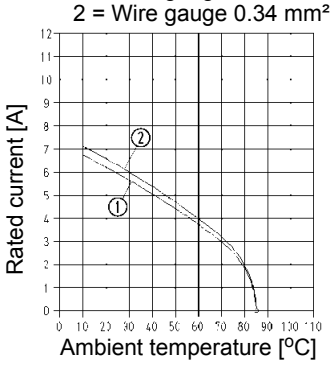
M8-XS, 3 poles
M8-S, 3 poles

1 = Wire gauge 0.1 mm²
2 = Wire gauge 0.14 mm²




M8-S, 4 poles

1 = Wire gauge 0.25 mm²
2 = Wire gauge 0.34 mm²






Further information and data sheets see www.HARTING.com

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# Notes





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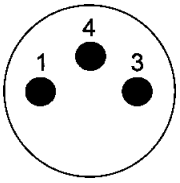
Mating face

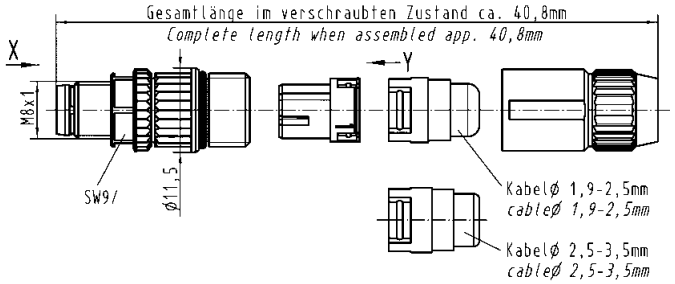



A-coding
Mating face
acc. to IEC 61076-2-101



## Applications / Advantages

- Actor and sensor applications
- Unshielded versions
- *HARAX*® rapid termination
- Overmoulded system cables in various lengths
- Robust design, quick assembly

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M8-XS<br> <br>Male<br>straight version, 3 poles<br>for 0.1 - 0.14 mm² | 21 02 159 1305 |  | |



Further information and data sheets see www.HARTING.com

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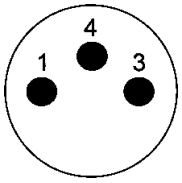
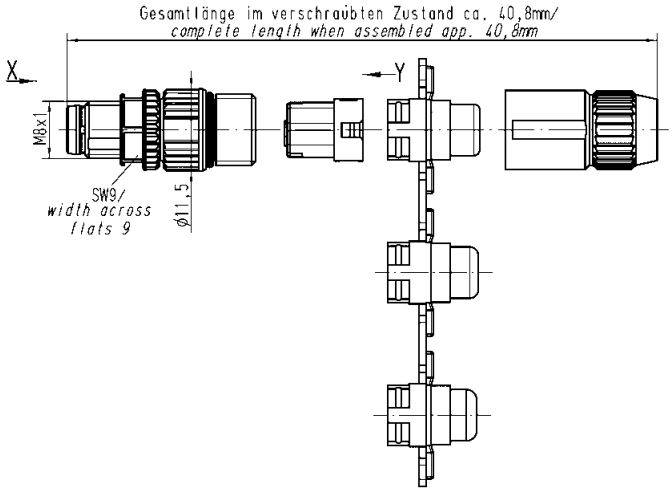
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M8-S | | | |
| Male straight version, 3 poles for 0.14 - 0.34 mm² | 21 02 151 1305 |   View mating side: 3 poles, male View mating side: 4 poles, male | |
| Male straight version, 4 poles for 0.14 - 0.34 mm² | 21 02 151 1405 | | |





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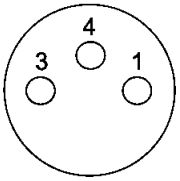
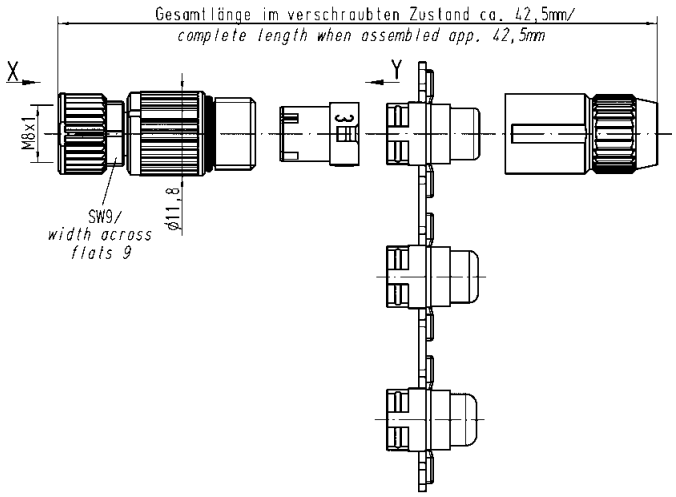
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M8-S | | | |
| Female straight version, 3 poles for 0.14 - 0.34 mm² | 21 02 151 2305 |  | |
| Female straight version, 4 poles for 0.14 - 0.34 mm² | 21 02 151 2405 | | |





Further information and data sheets see www.HARTING.com

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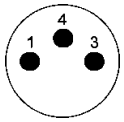
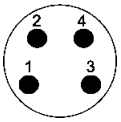
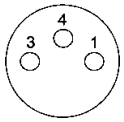
# M8 System cables 3 and 4 poles



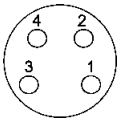
Male, 3 poles



Male, 4 poles



Female, 3 poles

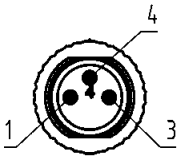


Female, 4 poles

## Technical characteristics

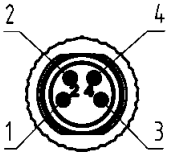
System cables with M8 circular connectors without PE

| | 3 poles | | 4 poles | |
|---|---|---|---|---|
| | PVC | PUR | PVC | PUR |
| Rated voltage | max. 60 V AC/DC | max. 60 V AC/DC | max. 30 V AC/DC | max. 30 V AC/DC |
| Rated currrent / contact | max. 3 A at +40 °C | max. 3 A at +40 °C | max. 3 A at +40 °C | max. 3 A at +40 °C |
| Screw locking | M8x1, self securing | M8x1, self securing | M8x1, self securing | M8x1, self securing |
| Recommended torque | 0.4 Nm | 0.4 Nm | 0.4 Nm | 0.4 Nm |
| Temperature range (working and storage) | -30 °C … +80 °C | -30 °C … +80 °C | -30 °C … +80 °C | -30 °C … +80 °C |
| Degree of protection | IP67 | IP67 | IP67 | IP67 |
| Number of wires / wire gauge | 3 x 0.25 mm² | 3 x 0.25 mm² | 3 x 0.25 mm² | 3 x 0.25 mm² |
| Conductor insulation | PVC (bn, bu, bk) | PVC (bn, bu, bk) | PVC (bn, wh, bu, bk) | PVC (bn, wh, bu, bk) |
| Arrangement of insulated strands | 32 x Ø 0.1 mm | 32 x Ø 0.1 mm | 32 x Ø 0.1 mm | 32 x Ø 0.1 mm |
| Sheath | PVC | PUR (UL, CSA) | PVC | PUR (UL, CSA) |
| Sheath colour | grey | black | grey | black |
| Outer diameter | Ø 4.40 ± 0.15 mm | Ø 4.40 ± 0.15 mm | Ø 4.70 ± 0.15 mm | Ø 4.40 ± 0.15 mm |
| Useable as trailing cable | no | yes | no | yes |
| Halogen free acc. to | – | DIN VDE 0472 part 815 | – | DIN VDE 0472 part 815 |
| Flame retardant acc. to | DIN EN 60 332-2-2 | cUL20549 | DIN EN 60 332-2-2 | cUL20549 |
| Oil-resistant | – | – | – | – |




Loading-Plan:

1 brown
3 blue
4 black




Loading-Plan:

1 brown
2 white
3 blue
4 black



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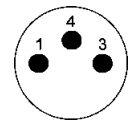
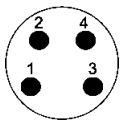
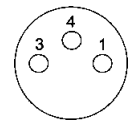
# M8 System cables 3 and 4 poles



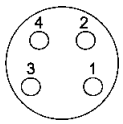
Male, 3 poles



Male, 4 poles



Female, 3 poles



Female, 4 poles

## Part number definition

| 2 | 1 | 3 | 4 | X | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Connector 1**
80 Male straight
81 Female straight
82 Male angled
83 Female angled

**Connector 2**
00 No connector
80 Male straight
81 Female straight
82 Male angled
83 Female angled

**Number of contacts**
3 3 poles
4 4 poles

**Cable material**
80 PVC (3 poles)
81 PVC (4 poles)
88 PUR (3 poles)
89 PUR (4 poles)

**Preferred length***
005 0.5 m
010 1.0 m
015 1.5 m
020 2.0 m
050 5.0 m
075 7.5 m
100 10.0 m

* Other length on request



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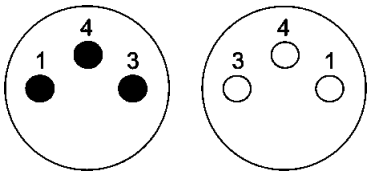
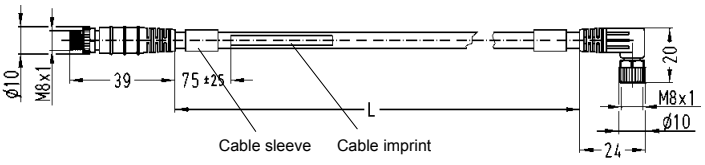
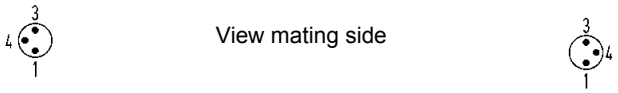
Mating face



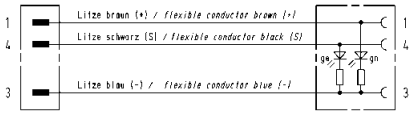

A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **M8 Circular connectors**<br>Female angled, with LED<br>Male straight | | | | |
| Length: | 0.3 m | 21 02 454 7301 | | |
| | 0.6 m | 21 02 454 7302 | | |
| | 1.0 m | 21 02 454 7303 | | |
| | 1.5 m | 21 02 454 7304 | | |
| | 2.0 m | 21 02 454 7305 | | |




Schematic diagram





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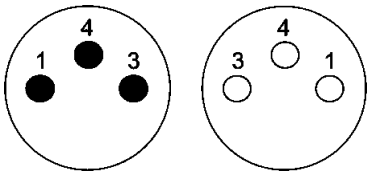
# M8 System cables

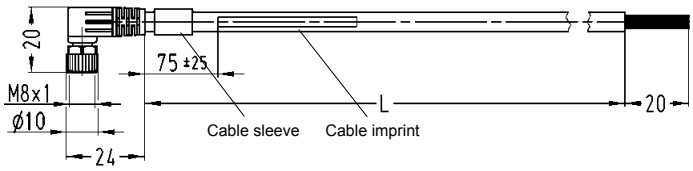


Mating face

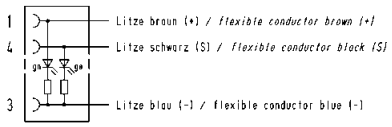



A-coding
Mating face
acc. to IEC 61076-2-101

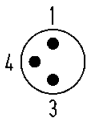
| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **M8 Circular connectors**<br>Female angled, with LED pre-assembled on one end | | | | |
| Length: | 1.5 m | 21 02 554 7301 | | |
| | 3.0 m | 21 02 554 7302 | | |
| | 5.0 m | 21 02 554 7303 | | |
| | 7.5 m | 21 02 554 7304 | | |
| | 10.0 m | 21 02 554 7305 | | |




Schematic diagram




View mating side






Further information and data sheets see www.HARTING.com

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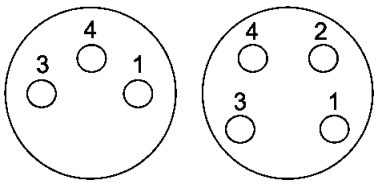
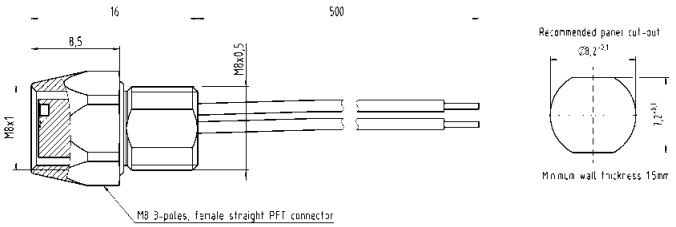
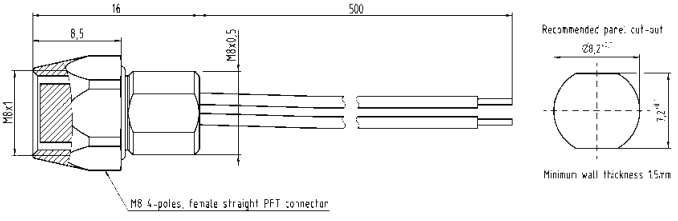
# M8 Panel feed-through

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M8 Panel feed-through<br> <br>Female<br>A-coding,<br>50 cm conductors, 0.5 mm², 3 poles<br><br>Panel thickness<br>min. 1.5 mm | 21 02 357 6305 |  | |
| M8 Panel feed-through<br> <br>Female<br>A-coding,<br>50 cm conductors, 0.5 mm², 4 poles<br><br>Panel thickness<br>min. 1.5 mm | 21 02 357 6405 |  | |



Further information and data sheets see www.HARTING.com

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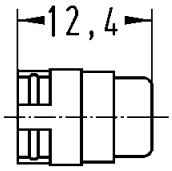
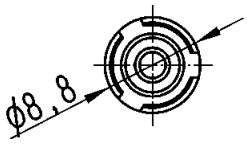
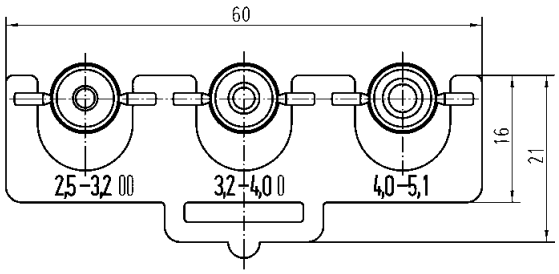
| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Seal M8<br>for 1.9 - 2.5 mm cable Ø<br>for 2.5 - 3.5 mm cable Ø<br>for 4.2 - 5.4 mm cable Ø | | 21 01 010 2016<br>21 01 010 2008<br>21 01 010 2005 |  |  |
| Set of seals for *HARAX*® M8-S<br>for 2.5 - 3.2 mm cable Ø<br>for 3.2 - 4.0 mm cable Ø<br>for 4.0 - 5.1 mm cable Ø | | 21 01 010 2013 |  | |
| M8<br>dynamometric screwdriver<br>Tightening torque 0.4 Nm | SW 9 | 09 99 000 0380 | | |



Further information and data sheets see www.HARTING.com

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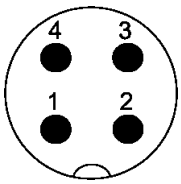
**Specifications** IEC 60352-4

**Approval**

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101



## Technical characteristics M12 – A-coding

| **Type M12 A-coded** | ***HARAX*® M12-S** | ***HARAX*® M12 angled** | ***HARAX*® M12 L 3 poles, 4 poles** |
|---|---|---|---|
| **General data** | | | |
| Conductor cross section | 0.14 - 0.34 mm²<br>AWG 26-22 | 0.25 - 0.5 mm²<br>AWG 24/7-20 | 0.34 - 0.75 mm²<br>AWG 22-18 |
| Diameter of individual strands | ≥ 0.1 mm | ≥ 0.1 mm | ≥ 0.1 mm |
| Conductor insulation material | PVC / PP / TPE | PVC | PVC |
| Conductor diameter | 1.0 - 1.6 mm | 1.2 - 1.6 mm | 1.6 - 2.0 mm<br>2.0 - 2.6 mm |
| Cable diameter | 2.9 - 4.0 mm<br>4.0 - 5.1 mm | 4 - 5.1 mm | 6 - 8 mm |
| Temperature range | -40 °C … +85 °C | -40 °C … +85 °C | -40 °C … +85 °C |
| Temperature during connection | -5° C … +50 °C | -5 °C … +50 °C | -5 °C … +50 °C |
| Degree of protection | IP67 | IP67 | IP65 / 67 |
| Mating cycles | 100 | 100 | 100 |
| Tightening torque connector / hexagonal wrench | 0.6 Nm / SW 13 | 0.6 Nm / SW 13 | 0.6 Nm / SW 17 |
| **Electrical characteristics** | | | |
| Rated current | 4 A | 4 A | 6 A |
| Rated voltage | 32 V | 32 V | 50 V |
| Rated impulse voltage | 1.5 kV | 1.5 kV | 1.5 kV |
| Contact resistance | 10 mΩ | 10 mΩ | 10 mΩ |
| Insulation resistance | $10^8$ Ω | $10^8$ Ω | $10^8$ Ω |
| Pollution degree | 3 | 3 | 3 |
| Overvoltage category | 3 | 3 | 3 |
| Isolation group | 1 | 1 | 1 |
| **Materials** | | | |
| Contact material | Brass | Brass | Brass |
| Contact plating | Gold | Gold | Gold |
| Contact carrier material | PA reinforced | PA | PA unreinforced |
| Housing material | PA reinforced | PA | PA unreinforced |





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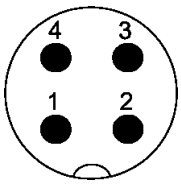
**Specifications** IEC 60 352-4

**Approval**

Mating face




A-coding
Mating face
acc. to IEC 61 076-2-101



## Technical characteristics M12 – A-coding

| **Type M12 A-coded** | ***HARAX*® M12-L 5 poles** | ***HARAX*® M12 L shielded** | **M12 Crimp** |
|---|---|---|---|
| **General data** | | | |
| Conductor cross section | 0.34 - 0.5 mm²<br>AWG 22-20 | 0.14 - 0.34 mm²<br>AWG 26-22 | 0.14 - 0.75 mm²<br>AWG 26-18 |
| Diameter of individual strands | ≥ 0.1 mm | ≥ 0.1 mm | X |
| Conductor insulation material | PVC | PVC | X |
| Conductor diameter | 1.2 - 2.0 mm | 1.2 - 1.6 mm | 2.0 - 2.3 mm |
| Cable diameter | 6 - 8 mm | 4.5 - 8.8 mm | 4.5 - 8.8 mm |
| Temperature range | -40 °C … +85 °C | -40 °C … +85 °C | -40 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C | -5 °C … +50 °C | -5 °C … +50 °C |
| Degree of protection | IP65 / 67 | IP65 / 67 | IP67 |
| Mating cycles | 100 | 100 | 500 |
| Tightening torque connector / hexagonal wrench | 0.6 Nm / SW 17 | 0.6 Nm / SW 17 | 0.5 Nm / SW 17 |
| **Electrical characteristics** | | | |
| Rated current | 4 A | 4 A | 4 A |
| Rated voltage | 50 V | 50 V | 250 V |
| Rated impulse voltage | 1.5 kV | 1.5 kV | 1.5 kV |
| Contact resistance | 10 mΩ | 10 mΩ | 10 mΩ |
| Insulation resistance | $10^8$ Ω | $10^8$ Ω | $10^8$ Ω |
| Pollution degree | 3 | 3 | 3 |
| Overvoltage category | 3 | 3 | 3 |
| Isolation group | 1 | 1 | 1 |
| **Materials** | | | |
| Contact material | Brass | Brass | Brass |
| Contact plating | Gold | Gold | Gold |
| Contact carrier material | PA unreinforced | PA unreinforced | PA |
| Housing material | PA unreinforced | PA unreinforced | PA |



Further information and data sheets see www.HARTING.com

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# Technical characteristics M12 – A-coding

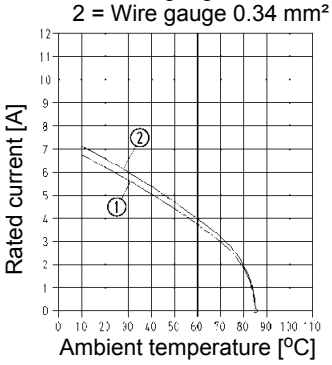
## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interruptet current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60512-5.

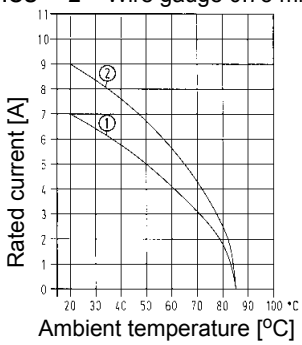
### M12-S, 4 poles

1 = Wire gauge 0.25 mm²
2 = Wire gauge 0.34 mm²



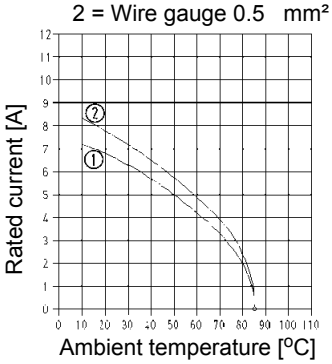

### M12-L 3 poles, 4 poles

1 = Wire gauge 0.34 mm²
2 = Wire gauge 0.75 mm²



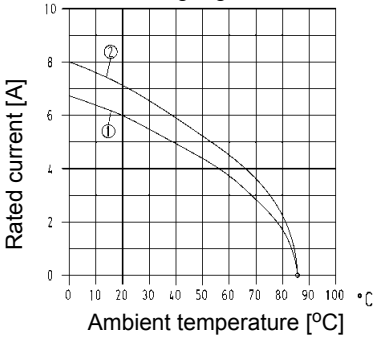

### M12, 4 poles, angled

1 = Wire gauge 0.25 mm²
2 = Wire gauge 0.5 mm²



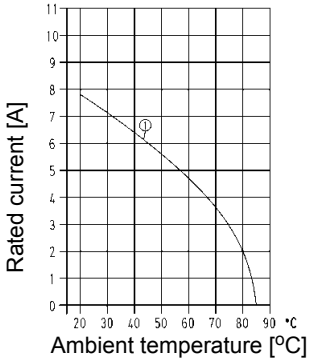

### M12L, 5 poles

1 = Wire gauge 0.25 mm²
2 = Wire gauge 0.34 mm²




### M12, Crimp

1 = Wire gauge 0.34 mm² / 0.5 mm²





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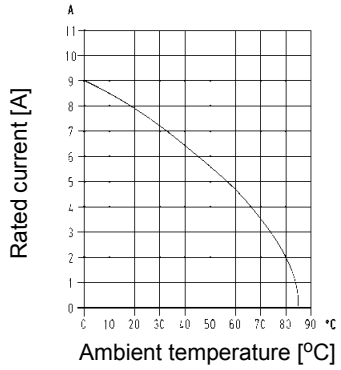
## Technical characteristics M12 – A-coding, PCB adapter

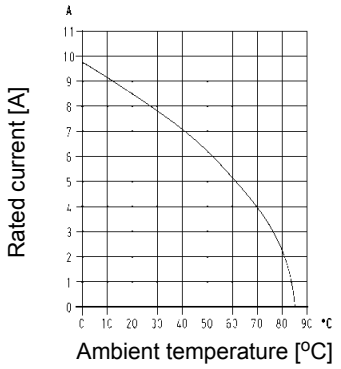
M12, A-coding, straight, male, 4 poles

Wire gauge 0.5 mm²



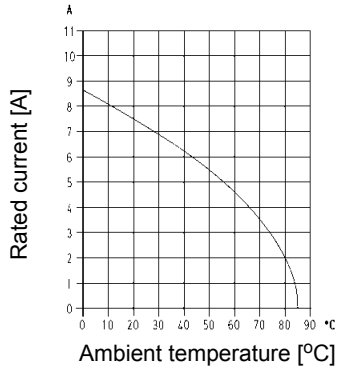

M12, A-coding, straight, female, 4 poles

Wire gauge 0.75 mm²



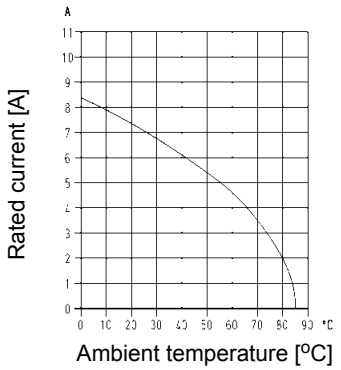

M12, A-coding, straight, female, 5 poles

Wire gauge 0.5 mm²




M12, A-coding, straight, male, 5 poles

Wire gauge 0.5 mm²







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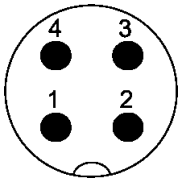
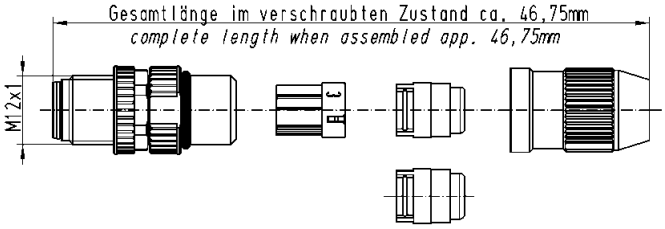
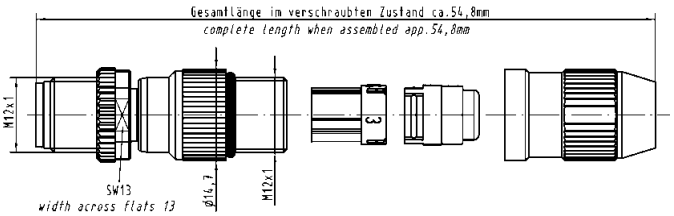
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

## Applications / Advantages

- Actor and sensor applications
- Shielded and unshielded versions
- Available with crimp resp. *HARAX*® rapid termination, or as overmoulded system cable in various lengths
- Robust design, quick assembly

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12-S | | | |
| <br>Male<br>straight version<br>4 poles, 0.14 - 0.34 mm² | 21 03 111 1405 |  | |
| Male<br>straight version<br>4 poles, 0.25 - 0.5 mm² | 21 03 112 1405 |  | |



Further information and data sheets see www.HARTING.com

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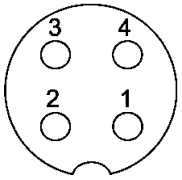
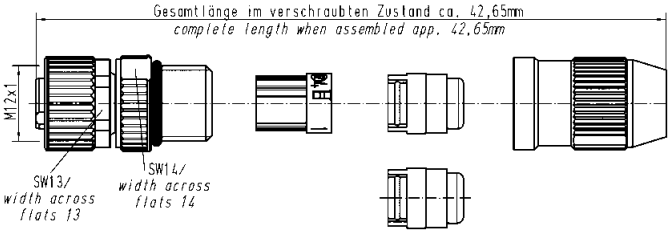
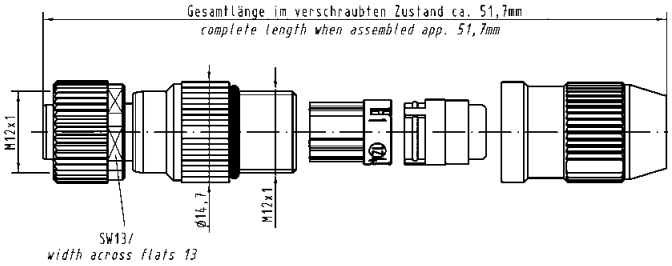
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12-S<br> <br>Female<br>straight version<br>4 poles, 0.14 - 0.34 mm² | 21 03 111 2405 |  | |
| Female<br>straight version<br>4 poles, 0.25 - 0.5 mm² | 21 03 112 2405 |  | |



Further information and data sheets see www.HARTING.com

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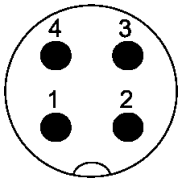
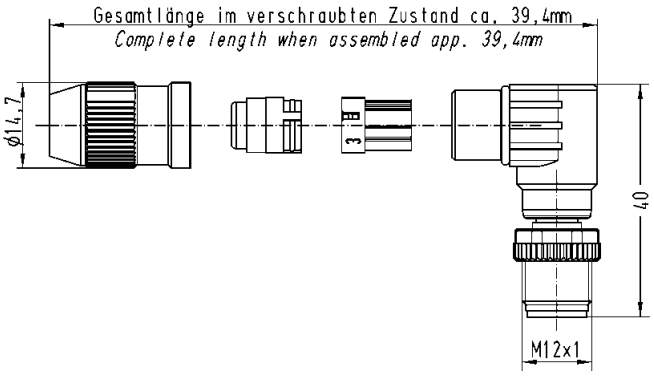
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12 Male angled version 4 poles | 21 01 140 5081 |   | |





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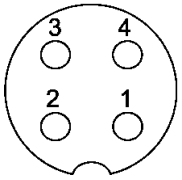
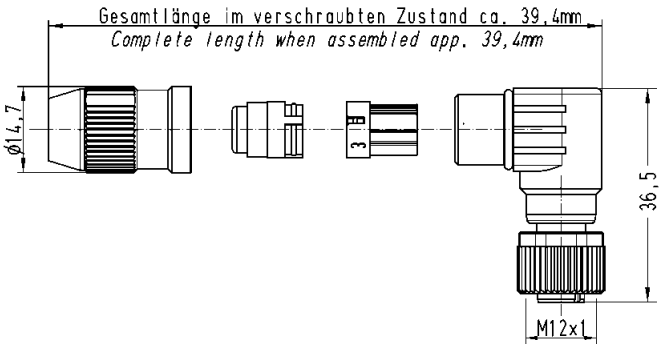
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12<br> <br>Female<br>angled version<br>4 poles | 21 01 140 5091 |  | |



Further information and data sheets see www.HARTING.com

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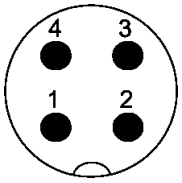
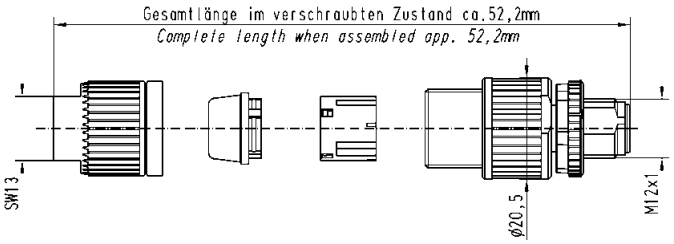
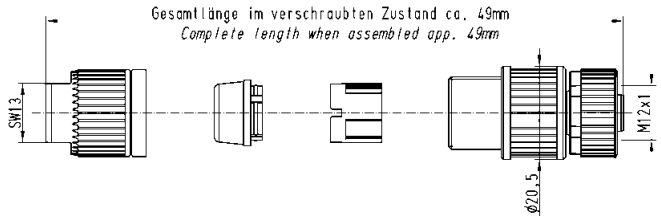
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| ***HARAX*® M12-L, unshielded**<br> <br>Male<br>3 poles, A-coding,<br>with pre-leading contact<br>(assignment 3, 4, 5)<br><br>3 poles, A-coding<br>(assignment 1, 3, 4)<br><br>4 poles, A-coding<br>(assignment 1, 2, 3, 4)<br><br>4 poles, A-coding,<br>to 2.6 mm core diameter<br>(assignment 1, 2, 3, 4)<br><br>0.34 - 0.75 mm²<br>AWG 22 - 18<br>Cable diameter: 6 - 8 mm | 21 03 212 1400<br><br>21 03 212 1306<br><br>21 03 212 1305<br><br>21 03 212 1407 |  | |
| ***HARAX*® M12-L, unshielded**<br> <br>Male<br>5 poles, A-coding<br><br>0.34 - 0.5 mm²<br>AWG 22 - 20<br>Cable diameter: 6 - 8 mm | 21 03 272 1505 |  | |



Further information and data sheets see www.HARTING.com

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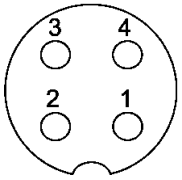
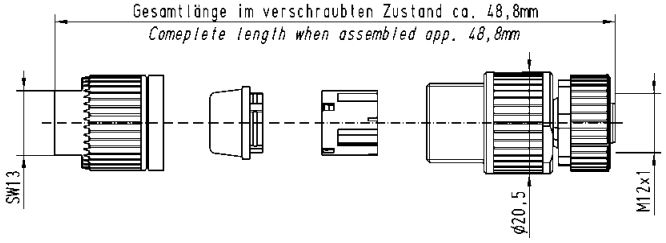
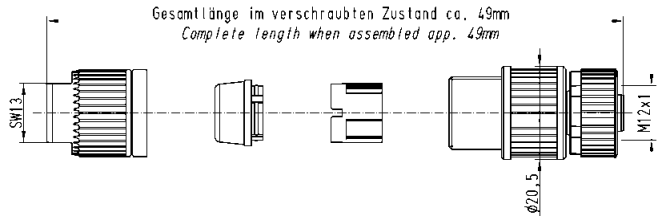
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| ***HARAX*® M12-L, unshielded**<br> <br>Female<br>3 poles, A-coding<br>(assignment 3, 4, 5)<br><br>3 poles, A-coding<br>(assignment 1, 3, 4)<br><br>4 poles, A-coding<br>(assignment 1, 2, 3, 4)<br><br>4 poles, A-coding,<br>to 2.6 mm core diameter<br>(assignment 1, 2, 3, 4)<br><br>0.34 - 0.75 mm²<br>AWG 22 - 18<br>Cable diameter: 6 - 8 mm | 21 03 212 2400<br><br>21 03 212 2306<br><br>21 03 212 2305<br><br>21 03 212 2407 |  <br> | |
| ***HARAX*® M12-L, unshielded**<br> <br>Female<br>5 poles, A-coding<br><br>0.34 - 0.5 mm²<br>AWG 22 - 20<br>Cable diameter: 6 - 8 mm | 21 03 272 2505 |  <br> | |



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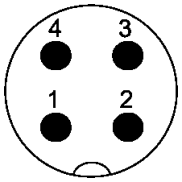
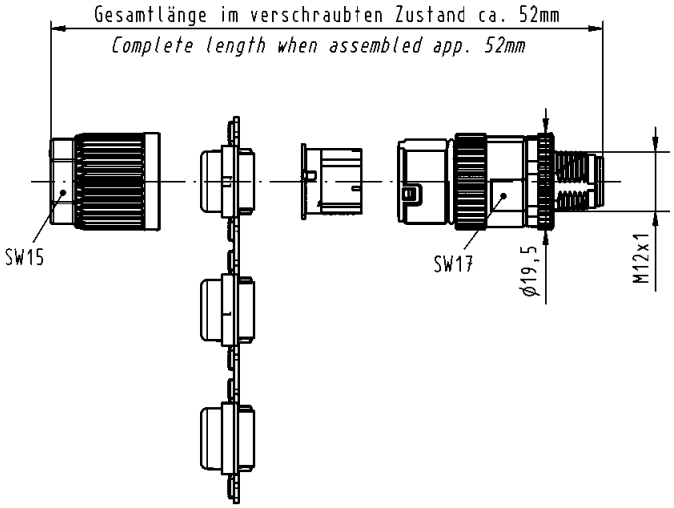
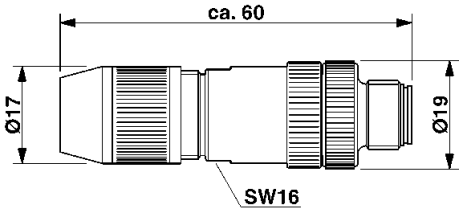
# M12 *HARAX*® A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12-L, shielded<br> <br>Male<br>4 poles, A-coding<br>0.14 - 0.34 mm² / AWG 26 - 22 | 21 03 221 1405 |  | |
| M12 Circular connector<br> <br>Male<br>with IDC termination technology,<br>8 poles<br>0.14 - 0.34 mm² / AWG 26 - 22 | 21 03 121 1801 |  | |



Further information and data sheets see www.HARTING.com

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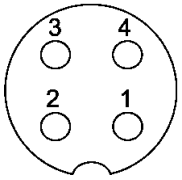
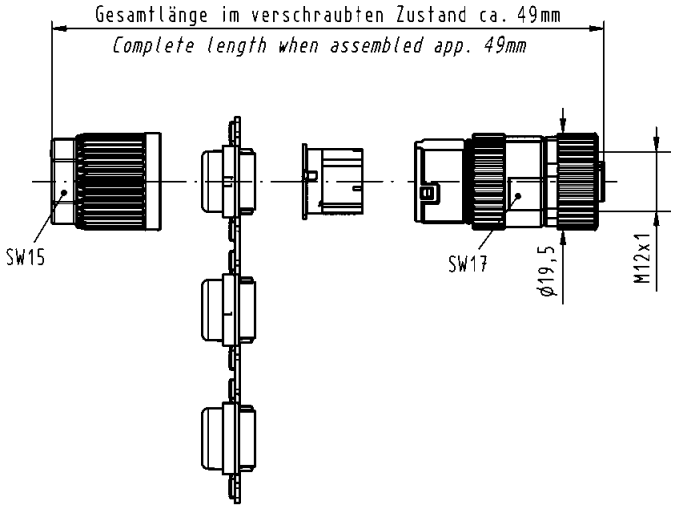
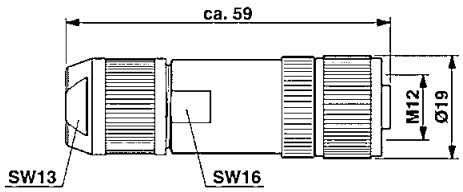
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12-L, shielded<br> <br>Female<br>4 poles, A-coding<br>0.14 - 0.34 mm² / AWG 26 - 22 | 21 03 221 2405 |  | |
| M12 Circular connectors<br> <br>Female<br>with IDC termination technology,<br>8 poles<br>0.14 - 0.34 mm² / AWG 26 - 22 | 21 03 121 2801 |  | |



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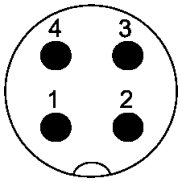
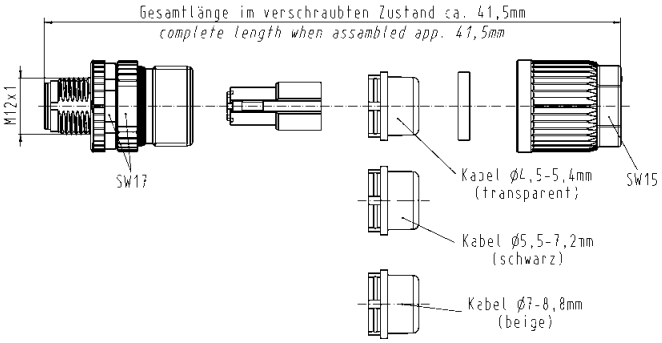
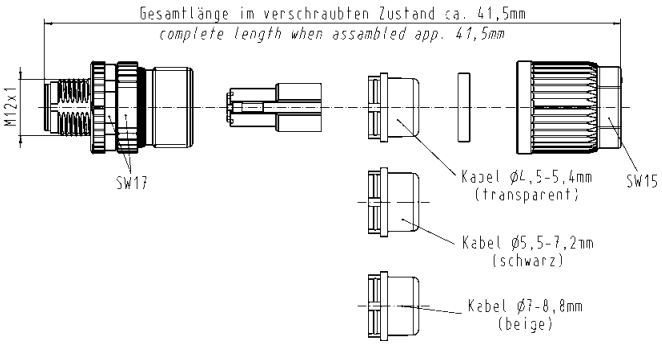
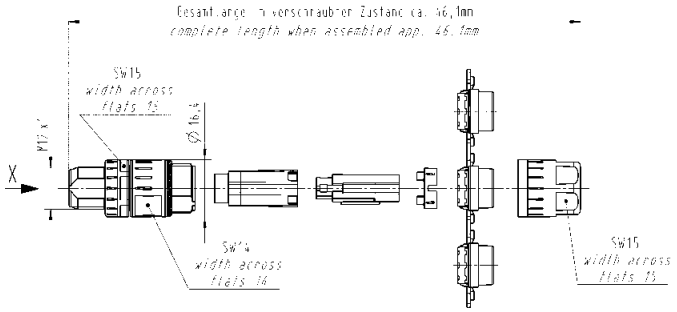
# M12 Crimp A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Crimp<br> <br>Male<br>4 poles, A-coding | 21 03 812 1405 |  | |
| M12 Crimp<br> <br>Male<br>5 poles, A-coding | 21 03 812 1505* |  | |
| M12 Crimp Slim design<br> <br>Male<br>5 poles, A-coding<br>Cable diameter: 5.7 - 8.8 mm | 21 03 821 1505* |  | |
| Male<br>8 poles, A-coding<br>Cable diameter: 5.7 - 8.8 mm | 21 03 821 1805* | | |



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* UL approval is in preparation

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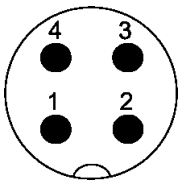
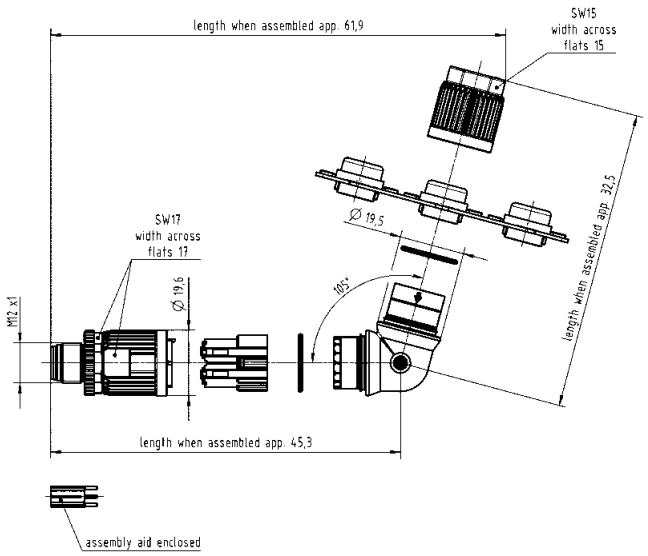
Mating face




A-coding
Mating face
acc. to IEC 61 076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Crimp, angled<br> <br>Male<br>5 poles, A-coding | 21 03 822 3505* |  | |





Further information and data sheets see www.HARTING.com
* UL approval is in preparation

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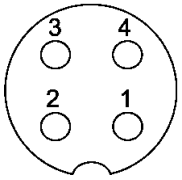
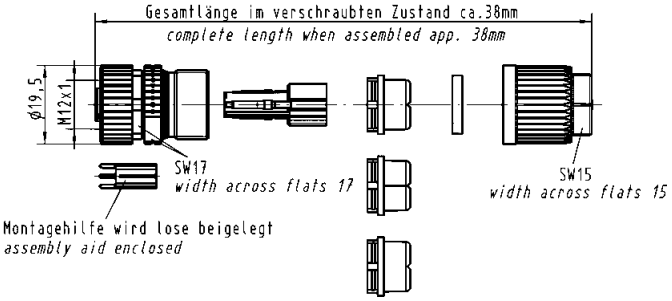
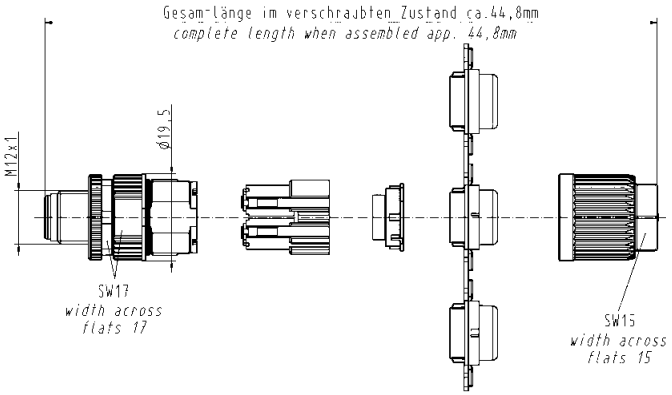
# M12 Crimp A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Crimp<br> <br>Female<br>4 poles, A-coding | 21 03 812 2405 |  | |
| M12 Crimp<br> <br>Female<br>5 poles, A-coding | 21 03 812 2505* |  | |



Further information and data sheets see www.HARTING.com
* UL approval is in preparation

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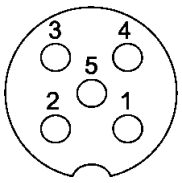
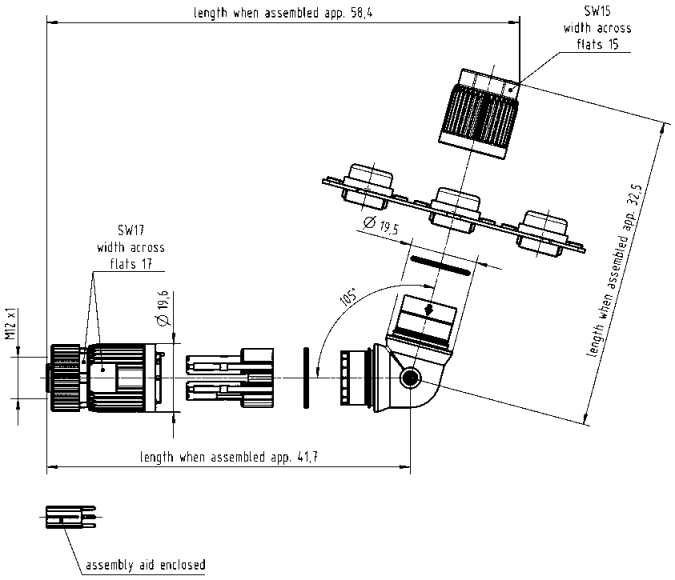
# M12 Crimp A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Crimp, angled<br> <br>Female<br>5 poles, A-coding | 21 03 822 4505* |  | |



Further information and data sheets see www.HARTING.com
* UL approval is in preparation



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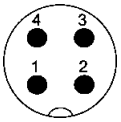
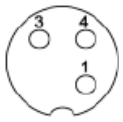
# M12 System cables, A-coding, 3 and 4 poles

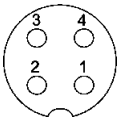
Male, 3 poles



Male, 4 poles



Female, 3 poles

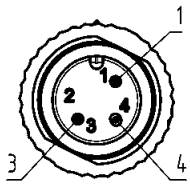


Female, 4 poles

## Technical characteristics

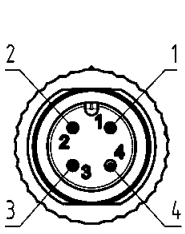
System cables with M12 circular connectors without PE, A-coding

| | 3 poles | | 4 poles | |
|---|---|---|---|---|
| | PVC | PUR | PVC | PUR |
| Rated voltage | max. 250 V AC/DC | max. 250 V AC/DC | max. 250 V AC/DC | max. 250 V AC/DC |
| Rated currrent / contact | max. 4 A at +40 °C | max. 4 A at +40 °C | max. 4 A at +40 °C | max. 4 A at +40 °C |
| Screw locking | M12x1, self securing | M12x1, self securing | M12x1, self securing | M12x1, self securing |
| Recommended torque | 0.6 Nm | 0.6 Nm | 0.6 Nm | 0.6 Nm |
| Temperature range (working and storage) | -30 °C … +80 °C | -30 °C … +80 °C | -30 °C … +80 °C | -30 °C … +80 °C |
| Degree of protection | IP67 | IP67 | IP67 | IP67 |
| Number of wires / wire gauge | 3 x 0.34 mm² | 3 x 0.34 mm² | 4 x 0.34 mm² | 4 x 0.34 mm² |
| Conductor insulation | PVC (bn, bu, bk) | PP (bn, bu, bk) | PVC (bn, wh, bu, bk) | PP (bn, wh, bu, bk) |
| Arrangement of insulated strands | 42 x Ø 0.1 mm | 42 x Ø 0.1 mm | 42 x Ø 0.1 mm | 42 x Ø 0.1 mm |
| Sheath | PVC | PUR (UL, CSA) | PVC | PUR (UL, CSA) |
| Sheath colour | grey | black | grey | black |
| Outer diameter | Ø 4.4 ± 0.15 mm | Ø 4.4 ± 0.15 mm | Ø 4.7 ± 0.15 mm | Ø 4.7 ± 0.15 mm |
| Useable as trailing cable | no | yes | no | yes |
| Halogen free acc. to | – | DIN VDE 0472 part 815 | – | DIN VDE 0472 part 815 |
| Flame retardant acc. to | DIN EN 60332-2-2 | cUL20549 | DIN EN 60332-2-2 | cUL20549 |
| Oil-resistant | – | – | – | DIN EN 60811-2-1 |




Loading-Plan:

1 brown
3 blue
4 black




Loading-Plan:

1 brown
2 white
3 blue
4 black



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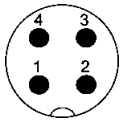
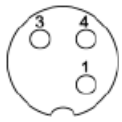
# M12 System cables, A-coding, 3 and 4 poles

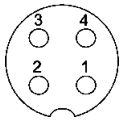
Male, 3 poles



Male, 4 poles



Female, 3 poles



Female, 4 poles

## Part number definition

| 2 | 1 | 3 | 4 | X | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Connector 1**
84 Male straight
85 Female straight
86 Male angled
87 Female angled

**Connector 2**
00 No connector
84 Male straight
85 Female straight
86 Male angled
87 Female angled

**Number of contacts**
3 3 poles
4 4 poles

**Cable material**
83 PVC (3 poles)
84 PVC (4 poles)
90 PUR (3 poles)
91 PUR (4 poles)

**Preferred length***
005 0.5 m
010 1.0 m
015 1.5 m
020 2.0 m
050 5.0 m
075 7.5 m
100 10.0 m

* Other length on request



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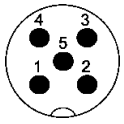
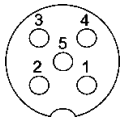
# M12 System cables, A-coding, 5 and 8 poles

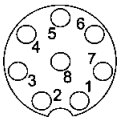


Male, 5 poles

Male, 8 poles



Female, 5 poles

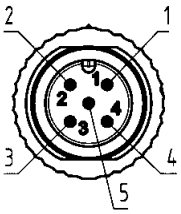


Female, 8 poles

## Technical characteristics

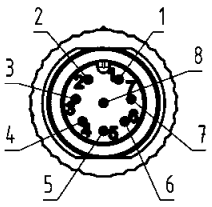
System cables with M12 circular connectors without PE, A-coding

| | 5 poles | 8 poles |
|---|---|---|
| | PVC | PVC |
| Rated voltage | max. 60 V AC/DC | max. 30 V AC/DC |
| Rated currrent / contact | max. 4 A at +40 °C | max. 2 A at +40 °C |
| Screw locking | M12x1, self securing | M12x1, self securing |
| Recommended torque | 0.6 Nm | 0.6 Nm |
| Temperature range (working and storage) | -30 °C … +80 °C | -30 °C … +80 °C |
| Degree of protection | IP67 | IP67 |
| Number of wires / wire gauge | 5 x 0.34 mm² | 8 x 0.25 mm² |
| Conductor insulation | PVC (bn, wh, bu, bk, gn/ye) | PVC (wh, bn, gn, ye, gy, pk, bu, rd) |
| Arrangement of insulated strands | 42 x Ø 0.1 mm | 32 x Ø 0.1 mm |
| Sheath | PVC | PVC |
| Sheath colour | grey | grey |
| Outer diameter | Ø 5.2 ± 0.15 mm | Ø 6.2 ± 0.2 mm |
| Useable as trailing cable | no | no |
| Halogen free acc. to | – | – |
| Flame retardant acc. to | DIN EN 60332-2-2 | DIN EN 60332-2-2 |
| Oil-resistant | – | – |




Loading-Plan:

1 brown
2 white
3 blue
4 black
5 green-yellow




Loading-Plan:

1 white
2 brown
3 green
4 yellow
5 grey
6 pink
7 blue
8 red



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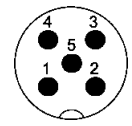
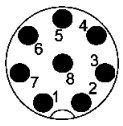
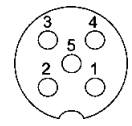
# M12 System cables, A-coding, 5 and 8 poles



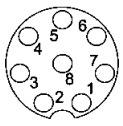
Male, 5 poles



Male, 8 poles



Female, 5 poles



Female, 8 poles

## Part number definition

| 2 | 1 | 3 | 4 | X | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Connector 1**
84 Male straight
85 Female straight
86 Male angled
87 Female angled

**Connector 2**
00 No connector
84 Male straight
85 Female straight
86 Male angled
87 Female angled

**Number of contacts**
5 5 poles
8 8 poles

**Cable material**
82 PVC (8 poles)
85 PVC (5 poles)

**Preferred length***
005 0.5 m
010 1.0 m
015 1.5 m
020 2.0 m
050 5.0 m
075 7.5 m
100 10.0 m

* Other length on request



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# M12 System cables, A-coding, 12 poles

Male, 12 poles

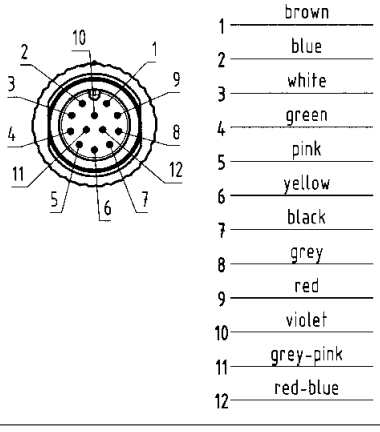
Female, 12 poles

## Technical characteristics

System cables with M12 circular connectors without PE, A-coding

| | 12 poles | |
|---|---|---|
| | PVC | PUR |
| Rated voltage | max. 30 V AC/DC | max. 30 V AC/DC |
| Rated currrent / contact | max. 1.5 A at +40 °C | max. 1.5 A at +40 °C |
| Screw locking | M12x1, self securing | M12x1, self securing |
| Recommended torque | 0.6 Nm | 0.6 Nm |
| Temperature range (working and storage) | -30 °C … +80 °C | -30 °C … +80 °C |
| Degree of protection | IP67 | IP67 |
| Number of wires / wire gauge | 12 x 0.14 mm² | 12 x 0.14 mm² |
| Conductor insulation | PVC (core: vt, rd/bu, gy/pk outer: bn, rd, gy, bk, ye, pk, gn, wh, bu) | PP (core: vt, rd/bu, gy/pk outer: bn, rd, gy, bk, ye, pk, gn, wh, bu) |
| Arrangement of insulated strands | 18 x Ø 0.1 mm | 18 x Ø 0.1 mm |
| Sheath | PVC | PUR (UL, CSA) |
| Sheath colour | grey | black |
| Outer diameter | Ø 6.2 ± 0.2 mm | Ø 6.1 ± 0.2 mm |
| Useable as trailing cable | no | yes |
| Halogen free acc. to | – | DIN VDE 0472 part 815 |
| Flame retardant acc. to | DIN EN 60332-1-2 | cUL20549 |
| Oil-resistant | DIN EN 60811-2-1 | – |

Loading-Plan:



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# M12 System cables, A-coding, 12 poles

Male, 12 poles

Female, 12 poles

## Part number definition

| 2 | 1 | 3 | 4 | X | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Connector 1**
84 Male straight
85 Female straight
86 Male angled
87 Female angled

**Connector 2**
00 No connector
84 Male straight
85 Female straight
86 Male angled
87 Female angled

**Number of contacts**
C 12 poles

**Cable material**
78 PUR
79 PVC

**Preferred length***
005 0.5 m
010 1.0 m
015 1.5 m
020 2.0 m
050 5.0 m
075 7.5 m
100 10.0 m

* Other length on request



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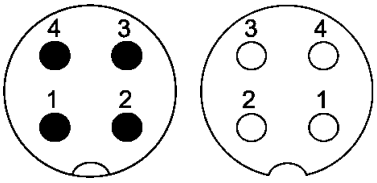
# M12 System cables, A-coded

Mating face

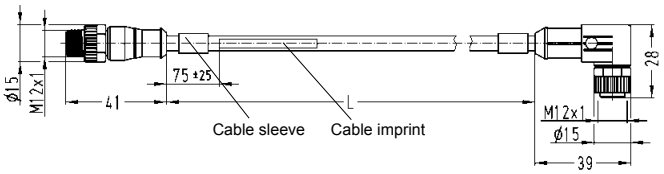


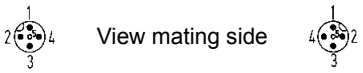

A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | | Part number |
|---|---|---|
| **M12 Circular connectors** | | |
| Female angled, with LED, Male straight | | |
| Length: | 0.3 m | 21 03 415 7401 |
| | 0.6 m | 21 03 415 7402 |
| | 1.0 m | 21 03 415 7403 |
| | 1.5 m | 21 03 415 7404 |
| | 2.0 m | 21 03 415 7405 |

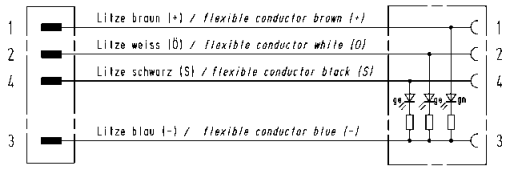
Drawing

Dimensions in mm




Schematic diagram






Further information and data sheets see www.HARTING.com

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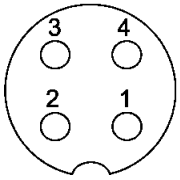
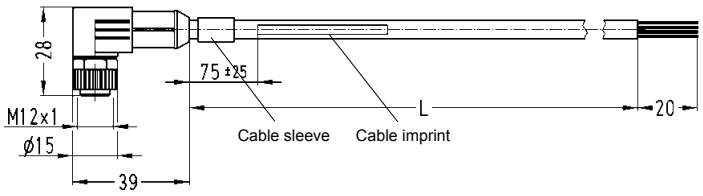
Mating face



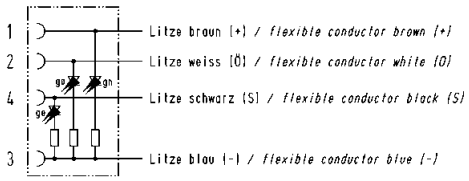

A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **M12 Circular connectors**<br>Female angled, with LED<br>pre-assembled on one end | | | | |
| Length: | 1.5 m | 21 03 515 7401 | | |
| | 3.0 m | 21 03 515 7402 | | |
| | 5.0 m | 21 03 515 7403 | | |
| | 7.5 m | 21 03 515 7404 | | |
| | 10.0 m | 21 03 515 7405 | | |




View mating side

Schematic diagram



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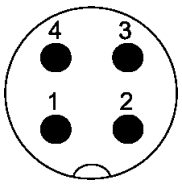
# M12 Panel feed-through *HARAX*® A-coded

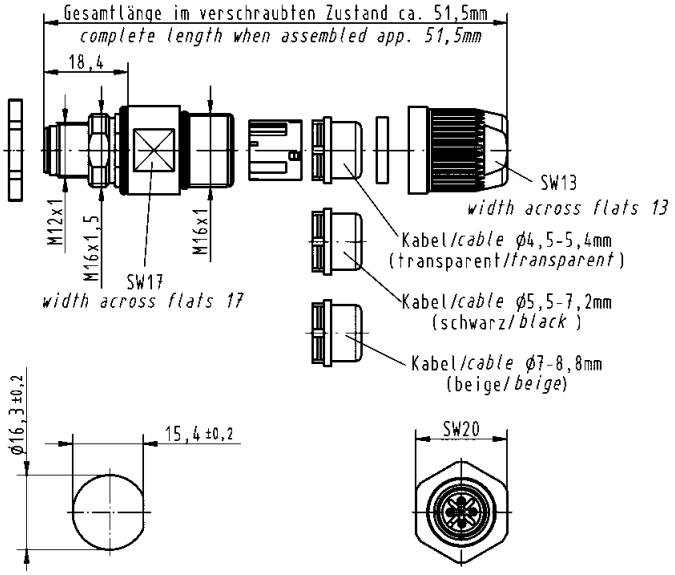
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

## Applications / Advantages

- Actor and sensor applications
- For panel feed-through or PCB, straight version in IP20 or IP67, with or without assembled pigtail
- Available with crimp resp. *HARAX*® rapid termination
- Quick and easy assembly

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® Panel feed-through<br> <br>Male<br>4 poles, A-coding<br>0.14 - 0.34 mm² / AWG 26 - 22<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 321 1425 |  | |



Further information and data sheets see www.HARTING.com

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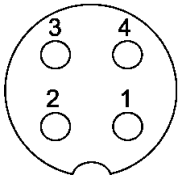
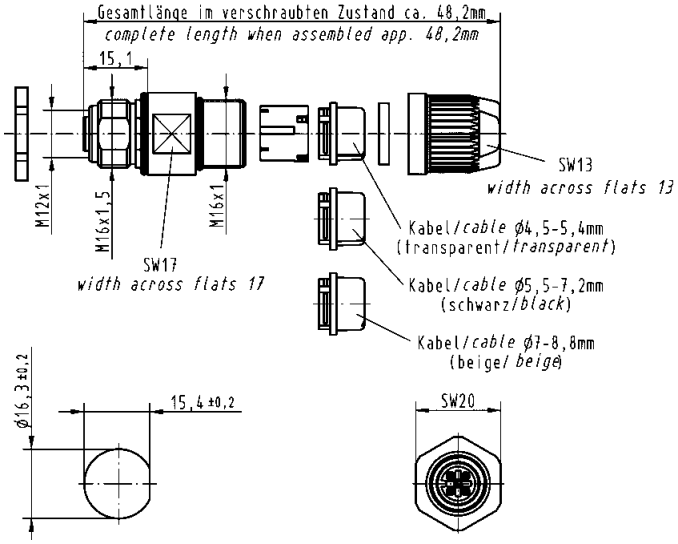
# M12 Panel feed-through *HARAX*® A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® Panel feed-through<br> <br>Female<br>4 poles, A-coding<br>0.14 - 0.34 mm² / AWG 26 - 22<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 321 2425 |  | |

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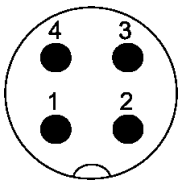
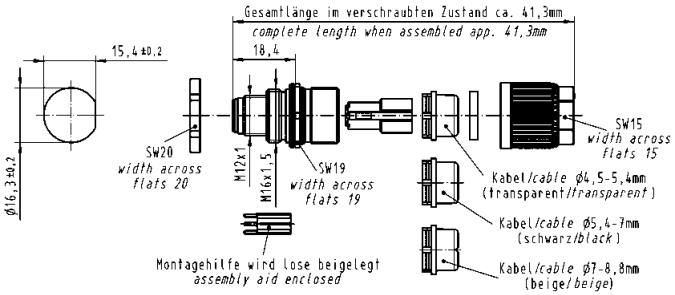
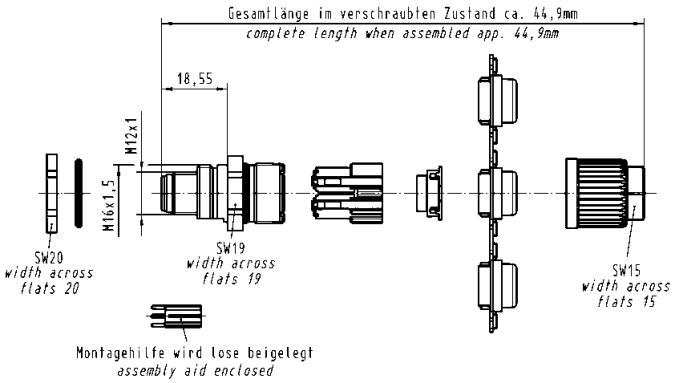
# M12 Panel feed-through Crimp A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through Crimp<br> <br>Male<br>4 poles, A-coding<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 822 1425 |  | |
| M12 Panel feed-through Crimp<br> <br>Male<br>5 poles, A-coding<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 822 1525* |  | |

Further information and data sheets see www.HARTING.com
* UL approval is in preparation



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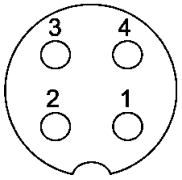
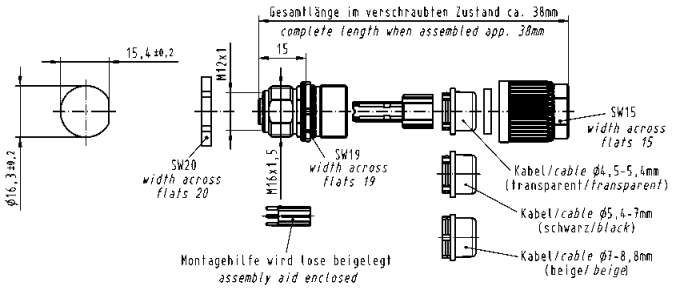
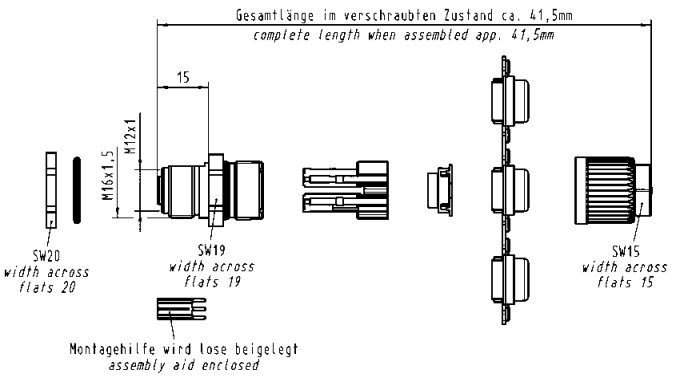
# M12 Panel feed-through Crimp A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through Crimp<br> <br>Female<br>4 poles, A-coding<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 822 2425 |  |
| M12 Panel feed-through Crimp<br> <br>Female<br>5 poles, A-coding<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 822 2525* |  |

Further information and data sheets see www.HARTING.com
* UL approval is in preparation



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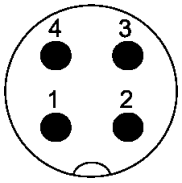
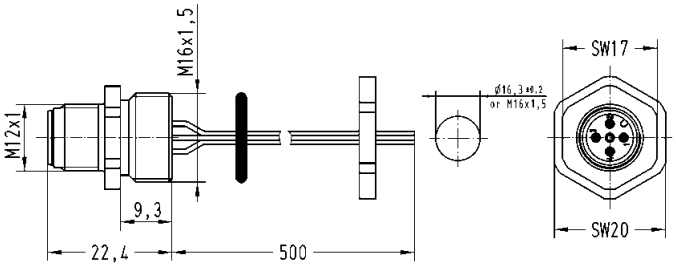
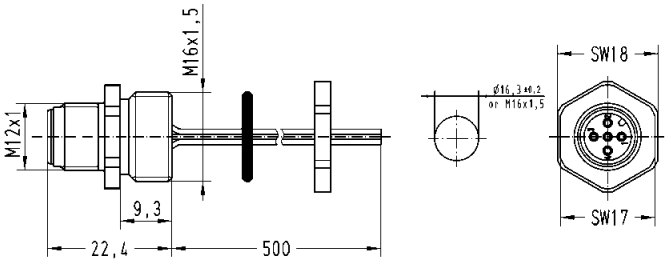
# M12 Panel feed-through A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 Panel feed-through**<br> <br>Male<br>A-coding,<br>50 cm conductors, 0.5 mm², 4 poles<br><br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 311 1402 |  | |
| Panel thickness<br>min. 1.0 mm<br>max. 4.0 mm | 21 03 371 1405 | | |
| **M12 Panel feed-through**<br> <br>Male<br>A-coding,<br>50 cm conductors, 0.5 mm², 5 poles<br><br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 311 1501 |  | |



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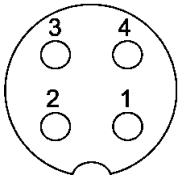
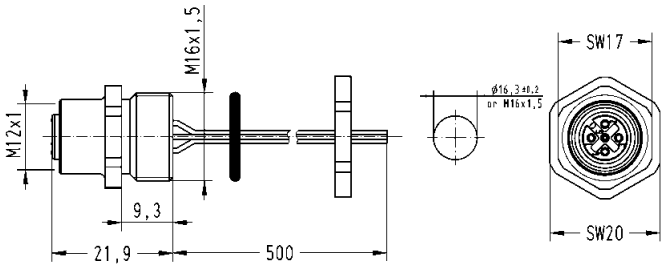
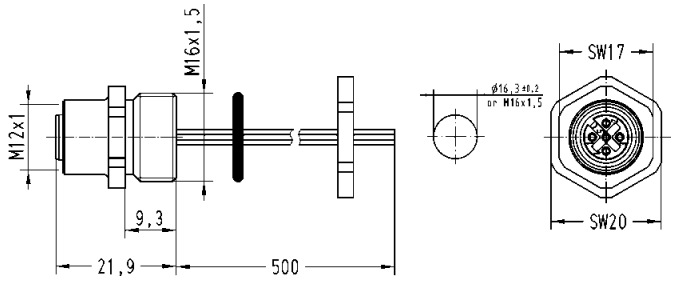
# M12 Panel feed-through A-coded

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through<br> <br>Female<br>A-coding,<br>50 cm conductors, 0.5 mm², 4 poles<br><br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 311 2400 |  | |
| M12 Panel feed-through<br> <br>Female<br>A-coding,<br>50 cm conductors, 0.5 mm², 5 poles<br><br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 311 2501 |  | |



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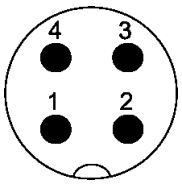
# M12 PCB adapter A-coded

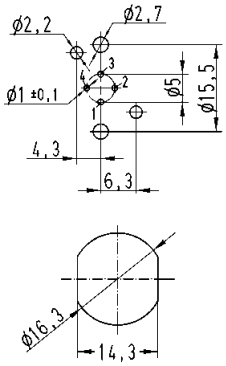
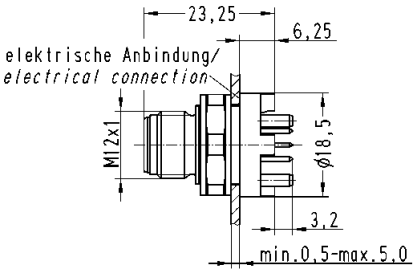
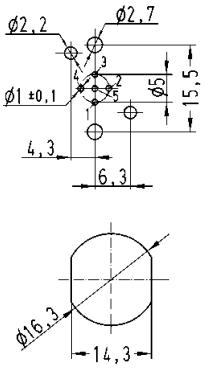
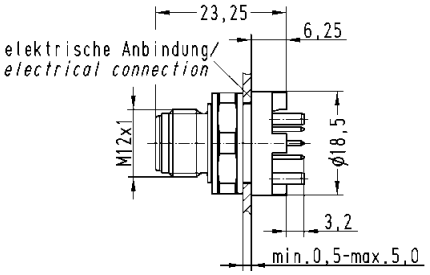
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

## Technical characteristics: M12 PCB adapter

| | | | |
|---|---|---|---|
| Degree of protection | IP20, IP67 (mated and locked) | Temperature during connection | -5 °C … +50 °C |
| Rated current | max. 4 A (dependant on PCB layout) | Termination | PIH |
| Rated voltage | 4 poles: 250 V<br>5 poles: 50 V | Contact material | Copper alloy |
| Mating cycles | max. 100 | Contact plating (mating side) | Au over Ni |
| Limiting temperature | -40 °C … +85 °C | Insulator material | PA |

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| M12 PCB adapter<br>Male, A-coding, straight | 4 poles, IP20<br>4 poles, IP67 | 21 03 321 1410<br>21 03 321 1420 |  |  |
| M12 PCB adapter<br>Male, A-coding, straight | 5 poles, IP20<br>5 poles, IP67 | 21 03 321 1510<br>21 03 321 1520 |  |  |





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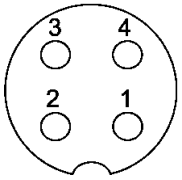
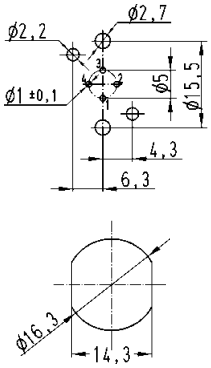
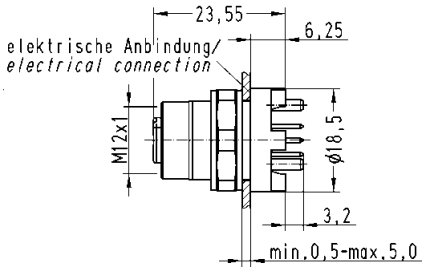
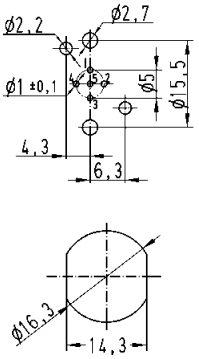
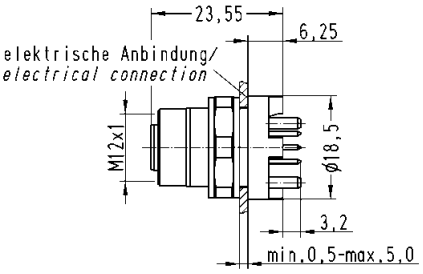
# M12 PCB adapter A-coded

Mating face




A-coding
Mating face
acc. to IEC 61 076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter**<br>Female, A-coding, straight<br> <br>4 poles, IP20<br>4 poles, IP67 | 21 03 321 6410<br>21 03 321 6420* |  <br> |  <br> |
| **M12 PCB adapter**<br>Female, A-coding, straight<br> <br>5 poles, IP20<br>5 poles, IP67 | 21 03 321 6510<br>21 03 321 6520 |  <br> |  <br> |



Further information and data sheets see www.HARTING.com
* UL approval is in preparation

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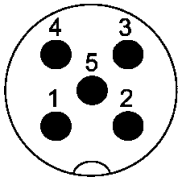
# M12 PCB adapter shielded A-coded

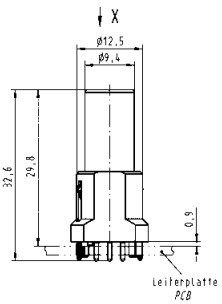
Mating face

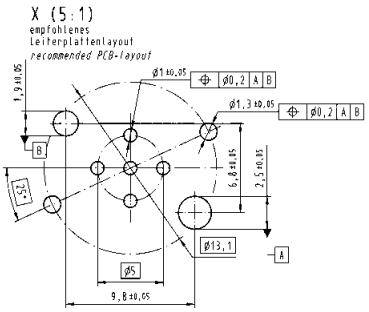


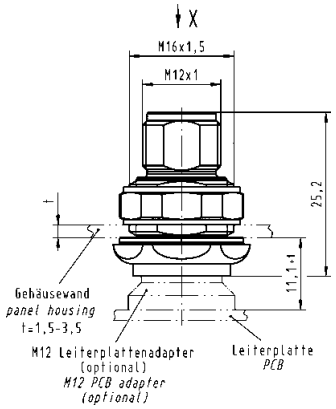

A-coding
Mating face
acc. to IEC 61076-2-101

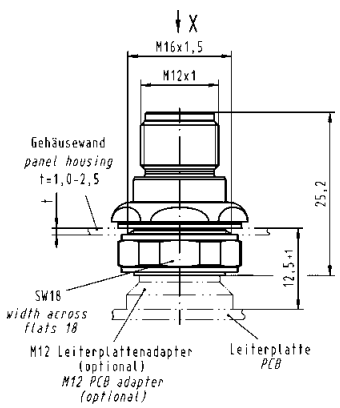
RoHS

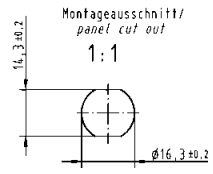
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter, shielded** | | | |
| **Packaging: 60 pieces in a tray**<br>**Order housing separately** | | | |
| Male | | | |
| 4 poles, A-coding | 21 03 321 1418* | | |
| 5 poles, A-coding | 21 03 321 1518* | | |
| 8 poles, A-coding | 21 03 321 1818* | | |
| **Packaging: 1 piece incl. housing** | | | |
| Male | | | |
| 5 poles, A-coding, rear mounting | 21 03 321 1530* | | |
| 8 poles, A-coding, rear mounting | 21 03 321 1830* | | |
| 5 poles, A-coding, front mounting | 21 03 321 1531* | | |
| 8 poles, A-coding, front mounting | 21 03 321 1831 | | |
| **Housing** | | | |
| **Packaging: 10 pieces in a tube** | | | |
| for rear mounting | 21 03 301 1000 | | |
| for front mounting | 21 03 301 1001 | | |

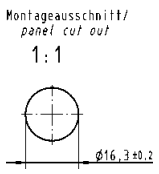




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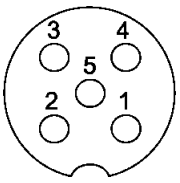
# M12 PCB adapter shielded A-coded

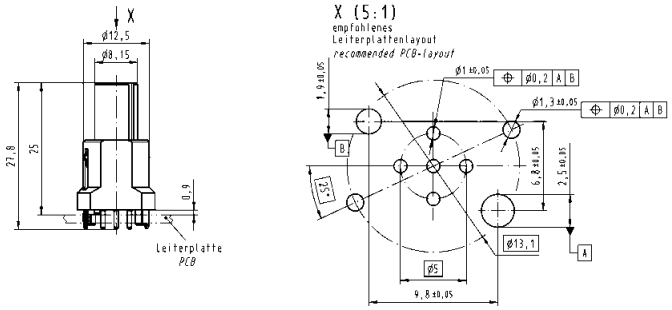
Mating face

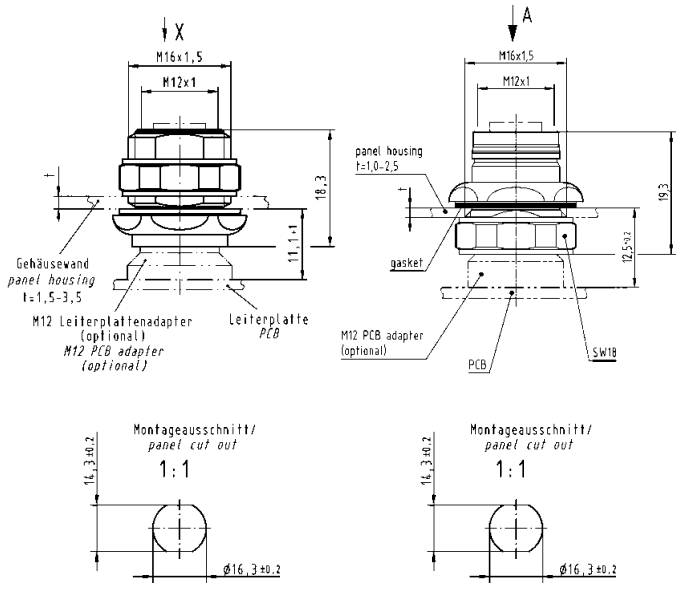



A-coding
Mating face
acc. to IEC 61076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter, shielded** | | | |
| **Packaging: 60 pieces in a tray**<br>**Order housing separately** | | | |
| Female | | | |
| 4 poles, A-coding | 21 03 321 2418* | | |
| 5 poles, A-coding | 21 03 321 2518* | | |
| 8 poles, A-coding | 21 03 321 2818* | | |
| **Packaging: 1 piece incl. housing** | | | |
| Female | | | |
| 5 poles, A-coding, rear mounting | 21 03 321 2530* | | |
| 8 poles, A-coding, rear mounting | 21 03 321 2830* | | |
| 5 poles, A-coding, front mounting | 21 03 321 2531* | | |
| 8 poles, A-coding, front mounting | 21 03 321 2831 | | |
| **Housing** | | | |
| **Packaging: 10 pieces in a tube** | | | |
| for rear mounting | 21 03 301 2000 | | |
| for front mounting | 21 03 301 2003 | | |








Further information and data sheets see www.HARTING.com
* UL approval is in preparation

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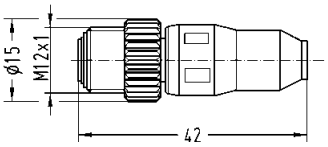
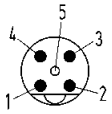
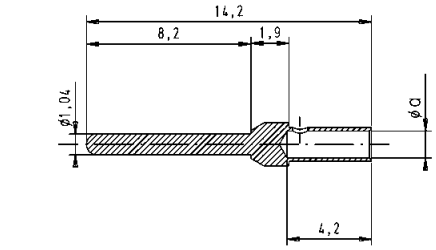
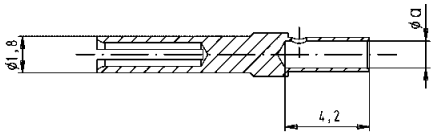
| Identification | Part number | Drawing |
|---|---|---|
| **M12-male moving load**<br>A-coding | 21 03 030 1400 |     |
| **HARTING M12 T-Coupler**<br>Profibus<br>A-coding | 21 03 321 9400<br>21 03 319 9501 | |
| **Crimping tool**<br>for M12 Crimp | 09 99 000 0501 | |
| **Accessories M12 Crimp** | | |
| **Locator** | | |
| for D-Sub contacts | 09 99 000 0531 | |
| for contact 21 01 100 9020 | 61 03 600 0023 | |
| **D-Sub single contacts (500 mating cycles)** | | |
| turned male contacts | |   |
| AWG 22 - 18 / 0.33 - 0.82 mm² | 09 67 000 3576 | |
| AWG 24 - 20 / 0.25 - 0.52 mm² | 09 67 000 8576 | |
| AWG 26 - 22 / 0.13 - 0.33 mm² | 09 67 000 5576 | |
| AWG 28 - 24 / 0.09 - 0.25 mm² | 09 67 000 7576 | |
| | | |
| turned female contacts | |   |
| AWG 22 - 18 / 0.33 - 0.82 mm² | 09 67 000 3476 | |
| AWG 24 - 20 / 0.25 - 0.52 mm² | 09 67 000 8476 | |
| AWG 26 - 22 / 0.13 - 0.33 mm² | 09 67 000 5476 | |
| AWG 28 - 24 / 0.09 - 0.25 mm² | 09 67 000 7476 | |
| | | |
| turned male contact for 8 pole connectors, A-coding, AWG 26 - 22 | 21 01 100 9020 | |
| **M12 dynamometric screwdriver**<br>Tightening torque 0.6 Nm | | |
| for M12-S SW 13 | 09 99 000 0382 | |
| for M12 Slim design SW 15 | 09 99 000 0646 | |
| for M12-L SW 17 | 09 99 000 0384 | |

D-Sub contacts

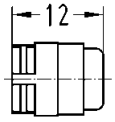
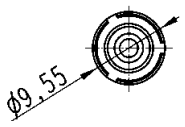
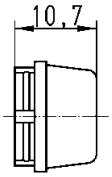
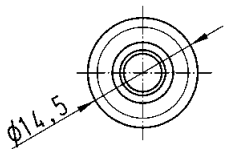
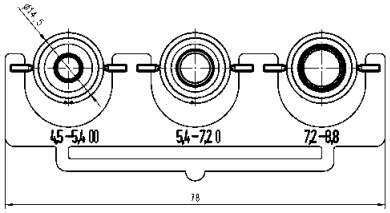
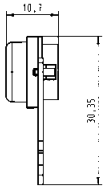
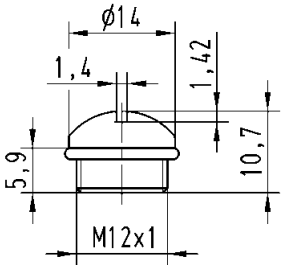
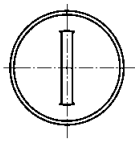
| Part number | AWG | Tool settings |
|---|---|---|
| 09 67 000 3x76 | 18 | 6 |
| | 20 | 6 |
| | 22 | 5 |
| 09 67 000 8x76 | 20, 22, 24 | 6 |
| 09 67 000 5x76 | 22, 24, 26 | 6 |

| | a |
|---|---|
| AWG 22 - 18 | 1.34 |
| AWG 24 - 20 | 1.13 |
| AWG 26 - 22 | 0.88 |



Further information and data sheets see www.HARTING.com

Downloaded from Arrow.com.

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Seal M12-S<br>for 2.9 - 4.0 mm cable Ø<br>for 4 - 5.1 mm cable Ø | | 21 01 010 2011<br>21 01 010 2001 |  |  |
| Seal M12-L unshielded<br>for 4.7 - 6 mm cable Ø<br>for 6 - 8 mm cable Ø | | 21 01 010 2015<br>21 01 010 2007 |  |  |
| Set of seals M12-L shielded<br>for 4.5 - 5.4 mm cable Ø<br>for 5.4 - 7.2 mm cable Ø<br>for 7.2 - 8.8 mm cable Ø | | 21 01 010 2017 |  |  |
| Cap M12<br>for IP65 / 67<br>Seals material Viton<br>Plastic cap for female | | 21 01 000 0003 |  |  |
| Accessories M12<br><br>Lock nut | | 21 01 000 0018 | | |





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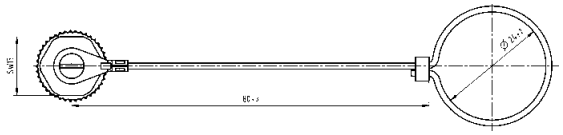
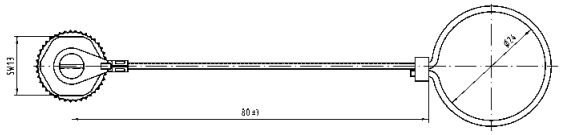
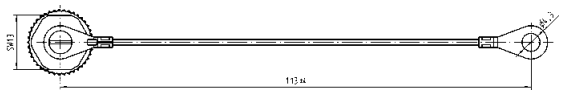
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Cap metal M12<br>for IP65 / 67<br>M12 metal cap for male side<br>with cord | 21 01 000 0033 |  | |
| Cap metal M12<br>for IP65 / 67<br>M12 metal cap for male side<br>with cable clip | 21 01 000 0038 | | |
| Cap metal M12<br>for IP65 / 67<br>M12 metal cap for female side<br>with cord | 21 01 000 0030 |  | |
| Cap metal M12<br>for IP65 / 67<br>M12 metal cap for female side<br>with cable clip | 21 01 000 0031 |  | |





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# Notes





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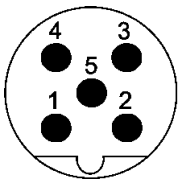
**Specifications** IEC 60352-4

**Approval**

Mating face




B-coding
Mating face
acc. to IEC 61076-2-101



## Technical characteristics M12 – B-coding

| **Type M12 B-coded** | ***HARAX*® M12 L shielded** | **M12 Crimp** |
|---|---|---|

**General data**

| | | |
|---|---|---|
| Conductor cross section | 0.25 - 0.34 mm²<br>AWG 24-22 | 0.13 - 0.75 mm²<br>AWG 26-18 |
| Diameter of individual strands | ≥ 0.1 mm | X |
| Conductor insulation material | PVC, Zell-PE | X |
| Conductor diameter | 2 - 2.6 mm | 2.0 - 2.3 mm |
| Cable diameter | 7.0 - 8.8 mm | 4 poles: 4.5 - 8.8 mm<br>5 poles: 4.5 - 8.8 mm |
| Temperature range | -40 °C … +85 °C | -40 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C | -5 °C … +50 °C |
| Degree of protection | IP65 / 67 | IP67 |
| Mating cycles | 100 | 500 |
| Tightening torque connector / hexagonal wrench | 0.6 Nm / SW 17 | 0.5 Nm / SW 17 |

**Electrical characteristics**

| | | |
|---|---|---|
| Rated current | 4 A | 4 A |
| Rated voltage | 32 V | 250 V |
| Rated impulse voltage | 1.5 kV | 1.5 kV |
| Contact resistance | 10 mΩ | 10 mΩ |
| Insulation resistance | $10^8$ Ω | $10^8$ Ω |
| Pollution degree | 3 | 3 |
| Overvoltage category | 3 | 3 |
| Isolation group | 1 | 1 |

**Materials**

| | | |
|---|---|---|
| Contact material | Brass | Brass |
| Contact plating | Gold | Gold |
| Contact carrier material | PA unreinforced | PA |
| Housing material | PA unreinforced | PA |



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## Technical characteristics M12 – B-coding

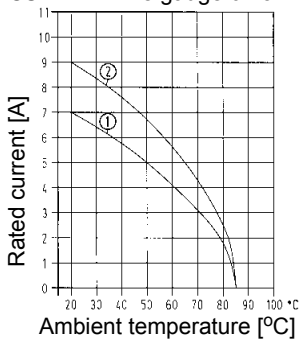
### Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interruptet current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512-5.

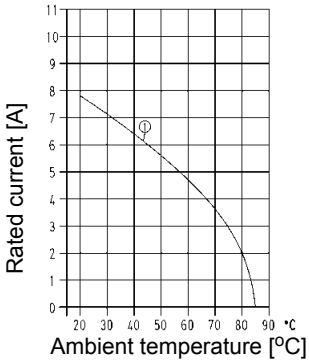
M12-L
3 poles, 4 poles

1 = Wire gauge 0.34 mm²
2 = Wire gauge 0.75 mm²




M12, Crimp

1 = Wire gauge 0.34 mm² / 0.5 mm²





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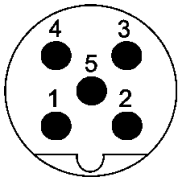
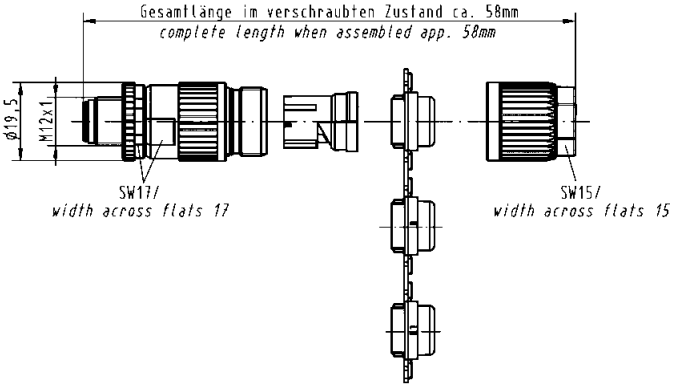
Mating face




B-coding
Mating face
acc. to IEC 61076-2-101

## Applications / Advantages

- B-coding for field bus systems e.g. Profibus, DeviceNet or CANopen
- Available with crimp resp. *HARAX*® rapid termination, or as overmoulded system cable in various lengths
- Shielding by the hood
- Easy handling, quick assembly

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12-L, shielded<br> <br>Male<br>2 poles, B-coding<br>0.25 - 0.34 mm² / AWG 24 - 22 | 21 03 241 1301 |  | |



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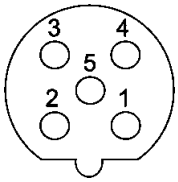
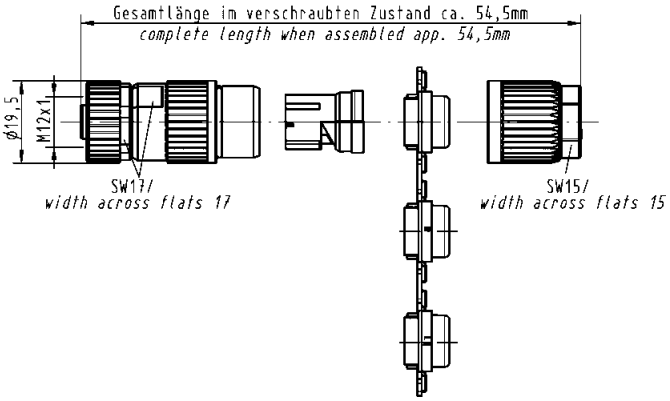
Mating face




B-coding
Mating face
acc. to IEC 61 076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12-L, shielded<br> <br>Female<br>2 poles, B-coding<br>0.25 - 0.34 mm² / AWG 24 - 22 | 21 03 241 2301 |  | |



Further information and data sheets see www.HARTING.com

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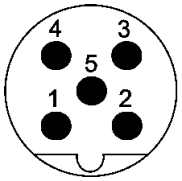
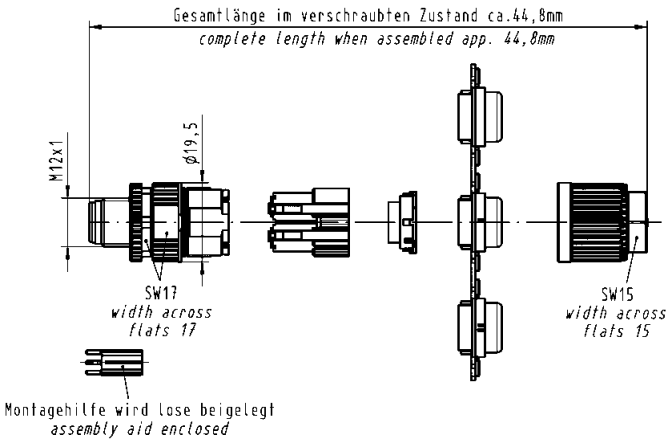
# M12 Crimp B-coded

Mating face




B-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Crimp Male<br>5 poles, B-coding | 21 03 841 1505 |  | |





Further information and data sheets see www.HARTING.com

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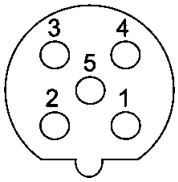
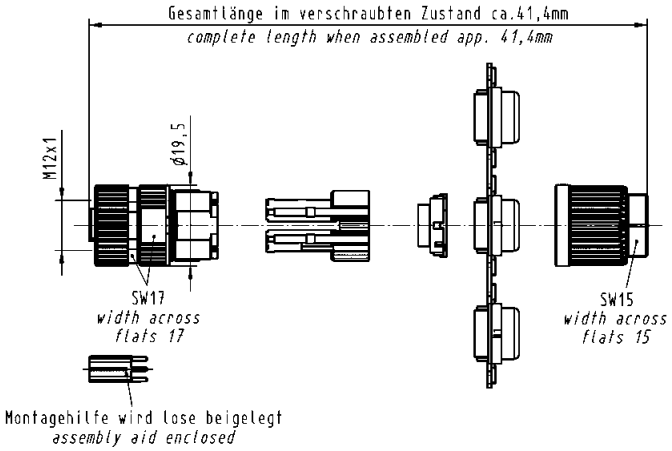
# M12 Crimp B-coded

Mating face




B-coding
Mating face
acc. to IEC 61 076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Crimp<br> <br>Female<br>5 poles, B-coding | 21 03 841 2505 |  | |



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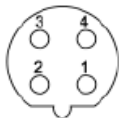
# M12 System cables, B-coding, 4 poles

Male, 4 poles

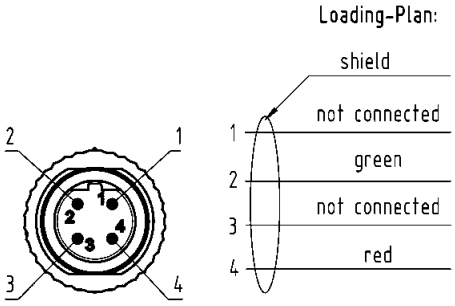



Female, 4 poles

## Technical characteristics

System cables with M12 circular connectors shielded, B-coding

| | 4-poles | |
|---|---|---|
| | PVC | PUR |
| Rated voltage | max. 160 V AC/DC | max. 160 V AC/DC |
| Rated currrent / contact | max. 4 A at +40 °C | max. 4 A at +40 °C |
| Screw locking | M12x1, self securing | M12x1, self securing |
| Recommended torque | 0.6 Nm | 0.6 Nm |
| Temperature range (working and storage) | -30 °C … +80 °C | -30 °C … +80 °C |
| Degree of protection | IP67 | IP67 |
| Number of wires / wire gauge | 2 x AWG 22 | 2 x AWG 24 |
| Conductor insulation | PVC (rd, gn) | PE (rd, gn) |
| Arrangement of insulated strands | 1 x Ø 0.65 mm | 19 x Ø 0.14 mm |
| Sheath | PVC | PUR (UL, CSA) |
| Sheath colour | violet | violet |
| Outer diameter | Ø 8.0 ± 0.4 mm | Ø 8.5 ± 0.4 mm |
| Useable as trailing cable | no | yes |
| Halogen free acc. to | – | DIN VDE 0472 part 815 |
| Flame retardant acc. to | DIN EN 60332-1-2 | DIN EN 60332-1-2 |
| Oil-resistant | IEC 80811-2-1 (4h/60°C) | DIN EN 60811-2-1 |



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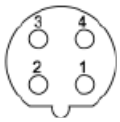
# M12 System cables, B-coding, 4 poles

Male, 4 poles




Female, 4 poles

## Part number definition

| 2 | 1 | 3 | 4 | X | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Connector 1**
88 Male straight
89 Female straight
90 Male angled
91 Female angled

**Connector 2**
00 No connector
88 Male straight
89 Female straight
90 Male angled
91 Female angled

**Number of contacts**
4 4 poles

**Cable material**
86 PVC
87 PUR

**Preferred length***
005 0.5 m
010 1.0 m
015 1.5 m
020 2.0 m
050 5.0 m
075 7.5 m
100 10.0 m

* Other length on request



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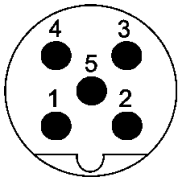
# M12 Panel feed-through *HARAX*® B-coded

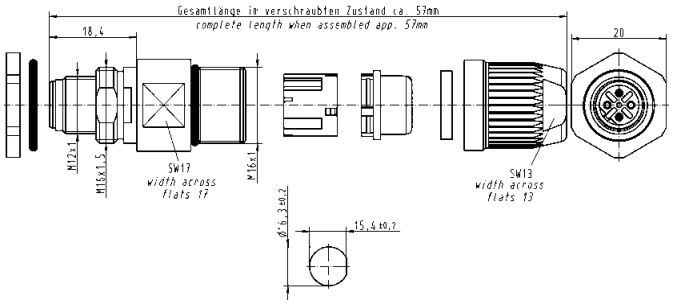
Mating face




B-coding
Mating face
acc. to IEC 61076-2-101

## Applications / Advantages

- B-coding for field bus systems e.g. Profibus, DeviceNet or CANopen
- For panel feed-through or PCB, straight version in IP20 or IP67, with or without assembled pigtail
- Available with crimp resp. *HARAX*® rapid termination
- Quick and easy assembly

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® Panel feed-through<br> <br>Male<br>2 poles and shielding, B-coding<br>0.25 - 0.34 mm² / AWG 24 - 22<br><br>Cable diameter: 7 - 8.8 mm<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 341 1425 |  | |



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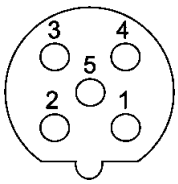
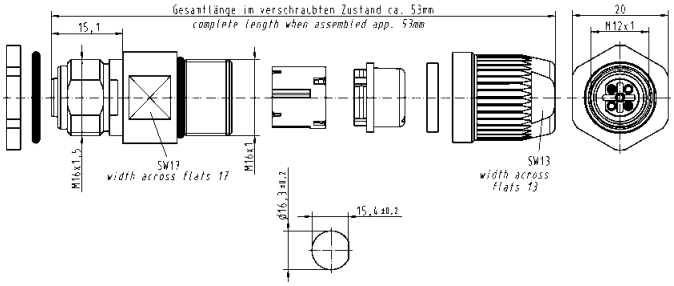
# M12 Panel feed-through *HARAX*® B-coded

Mating face




B-coding
Mating face
acc. to IEC 61076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® Panel feed-through<br> <br>Female<br>2 poles and shielding, B-coding<br>0.25 - 0.34 mm² / AWG 24 - 22<br><br>Cable diameter: 7 - 8.8 mm<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 341 2425 |  | |



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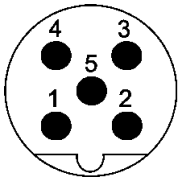
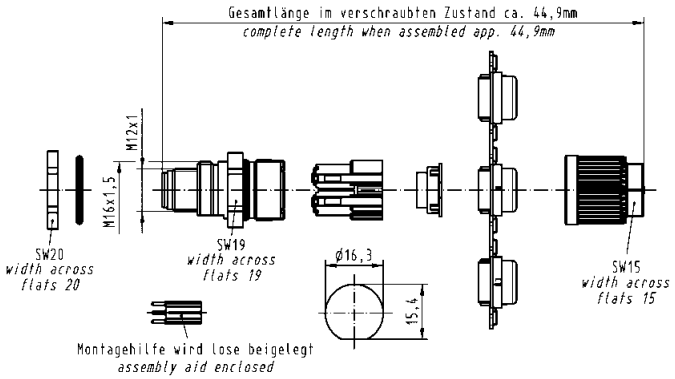
# M12 Panel feed-through Crimp B-coded

Mating face




B-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through Crimp<br> <br>Male<br>5 poles, B-coding<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 841 1525 |  | |





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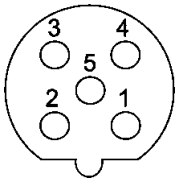
# M12 Panel feed-through Crimp B-coded

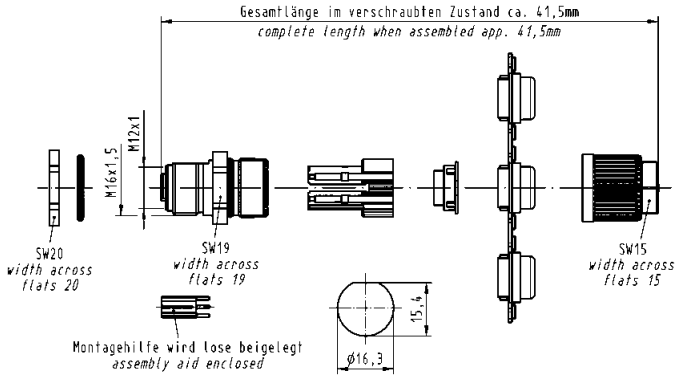
Mating face




B-coding
Mating face
acc. to IEC 61076-2-101

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through Crimp<br> <br>Female<br>5 poles, B-coding<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 841 2525 |  | |





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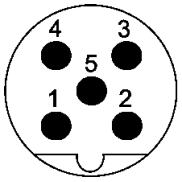
# M12 Panel feed-through B-coded

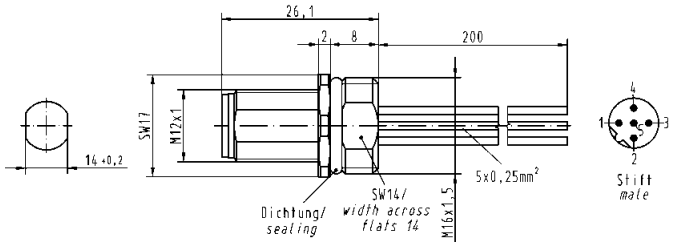
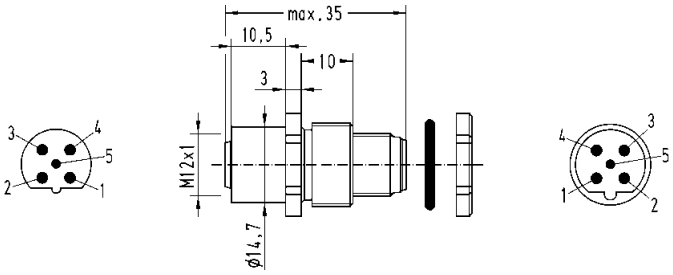
Mating face




B-coding
Mating face
acc. to IEC 61076-2-101

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through<br> <br>Male<br>B-coding, 20 cm conductors, 0.25 mm²<br><br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 339 1301 |  | |
| M12-male/female panel feed-through<br>B-coding<br> <br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 330 1300 |  | Rated voltage 24 V AC/DC<br>Thread M16 x 1.5 |



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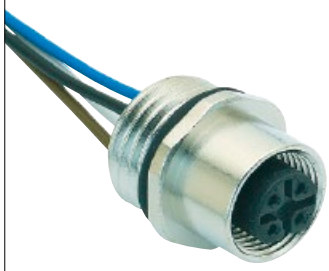
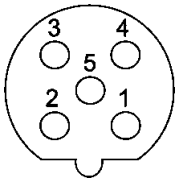
# M12 Panel feed-through B-coded



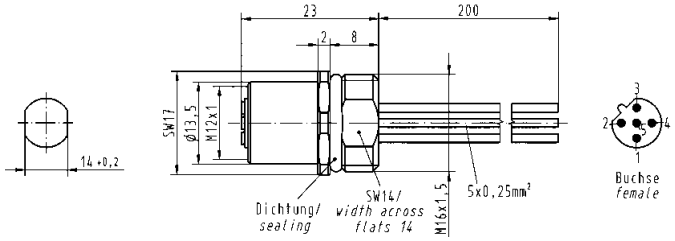
Mating face




B-coding
Mating face
acc. to IEC 61 076-2-101

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through<br> <br>Female<br>B-coding, 20 cm conductors,<br>0.25 mm²<br><br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 339 2301 |  | |



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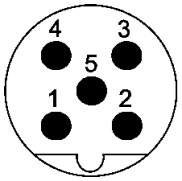
# M12 PCB adapter B-coded

Mating face

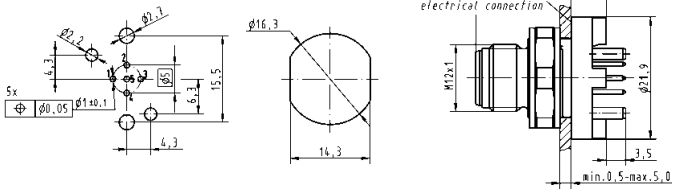



B-coding
Mating face
acc. to IEC 61076-2-101

RoHS

## Technical characteristics: M12 PCB adapter

| | | | |
|---|---|---|---|
| Degree of protection | IP20, IP67 (mated and locked) | Temperature during connection | -5 °C … +50 °C |
| Rated current | max. 4 A (dependant on PCB layout) | Termination | PIH |
| Rated voltage | 50 V | Contact material | Copper alloy |
| Mating cycles | max. 100 | Contact plating (mating side) | Au over Ni |
| Limiting temperature | -40 °C … +85 °C | Insulator material | PA |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 PCB adapter<br>Male, B-coding, straight<br> <br>5 poles, IP20 | 21 03 341 1505 |  | |





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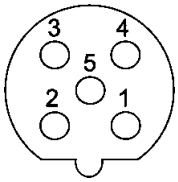
# M12 PCB adapter B-coded

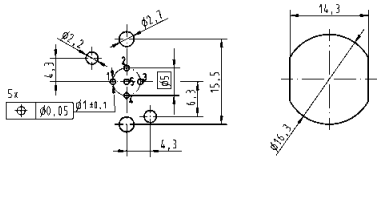
Mating face




B-coding
Mating face
acc. to IEC 61 076-2-101

RoHS



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 PCB adapter<br>Female, B-coding, straight<br> <br>5 poles, IP20 | 21 03 341 2505 |  | |





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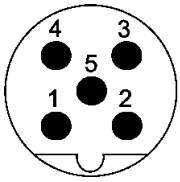
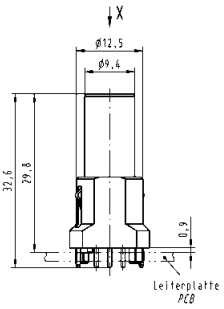
# M12 PCB adapter shielded B-coded

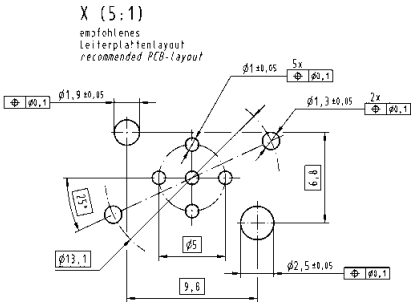
Mating face

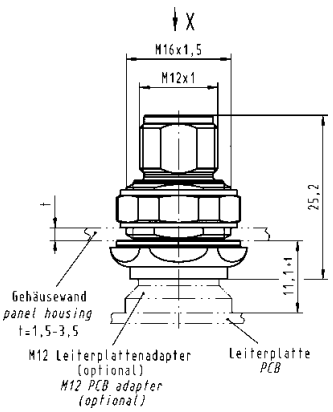


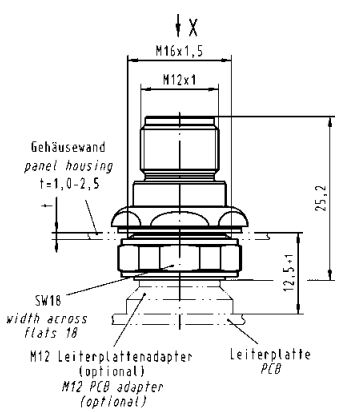

B-coding
Mating face
acc. to IEC 61076-2-101

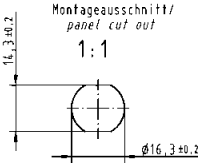
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter, shielded** | | | |
| **Packaging: 60 pieces in a tray**<br>**Order housing separately** | | | |
| Male<br>5 poles, B-coding | 21 03 341 1518* | | |
| **Packaging: 1 piece incl. housing** | | | |
| Male<br>5 poles, B-coding, rear mounting | 21 03 341 1530* | | |
| 5 poles, B-coding, front mounting | 21 03 341 1531* | | |
| **Housing** | | | |
| **Packaging: 10 pieces in a tube** | | | |
| for rear mounting | 21 03 301 1000 | | |
| for front mounting | 21 03 301 1001 | | |

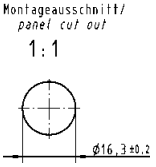


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* UL approval is in preparation

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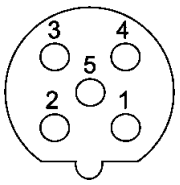
# M12 PCB adapter shielded B-coded

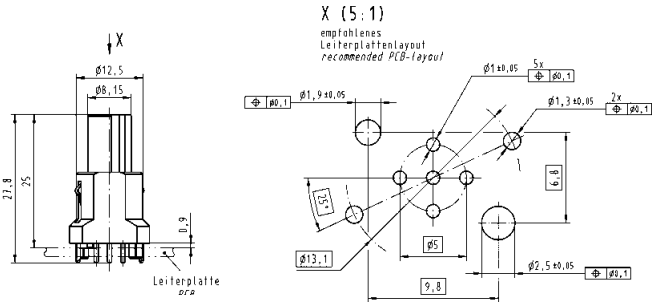
Mating face

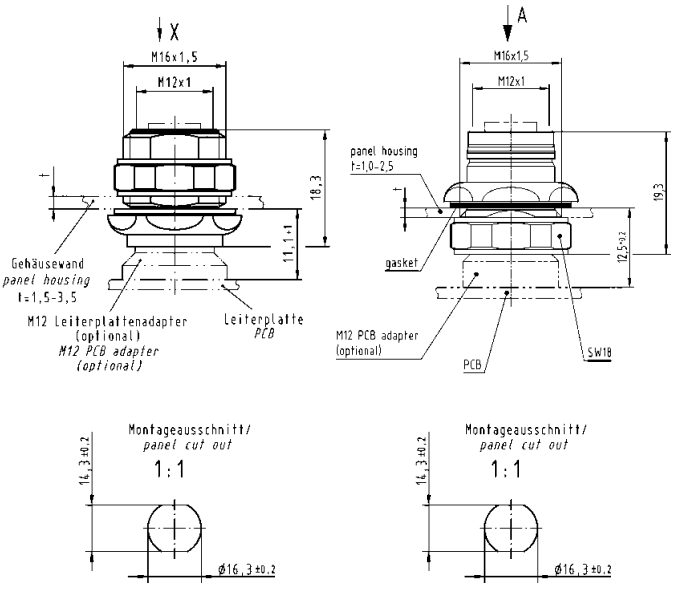



B-coding
Mating face
acc. to IEC 61076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter, shielded** | | | |
| **Packaging: 60 pieces in a tray**<br>**Order housing separately** | | | |
| Female<br>5 poles, B-coding | 21 03 341 2518* | | |
| **Packaging: 1 piece incl. housing** | | | |
| Female<br>5 poles, B-coding, rear mounting<br>5 poles, B-coding, front mounting | 21 03 341 2530*<br>21 03 341 2531* | | |
| **Housing** | | | |
| **Packaging: 10 pieces in a tube** | | | |
| for rear mounting | 21 03 301 2000 | | |
| for front mounting | 21 03 301 2003 | | |




Further information and data sheets see www.HARTING.com
* UL approval is in preparation



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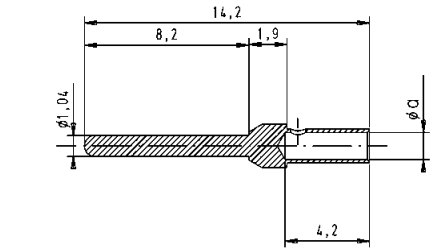
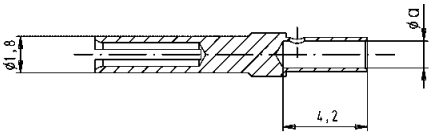
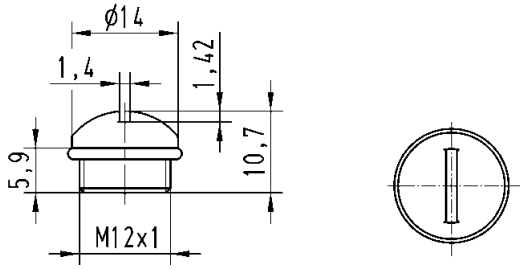
| Identification | Part number | Drawing |
|---|---|---|
| **Crimping tool**<br>for M12 Crimp | 09 99 000 0501 | |
| **Accessories M12 Crimp** | | |
| **Locator** | 09 99 000 0531 | |
| **D-Sub single contacts (500 mating cycles)** | | |
| turned male contacts | |  |
| AWG 22-18 / 0.33-0.82 mm² | 09 67 000 3576 | |
| AWG 24-20 / 0.25-0.52 mm² | 09 67 000 8576 | |
| AWG 26-22 / 0.13-0.33 mm² | 09 67 000 5576 | |
| AWG 28-24 / 0.09-0.25 mm² | 09 67 000 7576 | |
| | | |
| turned female contacts | |  |
| AWG 22-18 / 0.33-0.82 mm² | 09 67 000 3476 | |
| AWG 24-20 / 0.25-0.52 mm² | 09 67 000 8476 | |
| AWG 26-22 / 0.13-0.33 mm² | 09 67 000 5476 | |
| AWG 28-24 / 0.09-0.25 mm² | 09 67 000 7476 | |
| | | |
| **M12 dynamometric screwdriver**<br>Tightening torque 0.6 Nm | | |
| for M12-S SW 13 | 09 99 000 0382 | |
| for M12-L SW 17 | 09 99 000 0384 | |
| **Cap M12**<br>for IP65 / 67<br>Seals material Viton<br>Plastic cap for female | 21 01 000 0003 |  |
| | | |

D-Sub contacts

| Part number | AWG | Tool settings |
|---|---|---|
| 09 67 000 3x76 | 18 | 6 |
| | 20 | 6 |
| | 22 | 5 |
| 09 67 000 8x76 | 20, 22, 24 | 6 |
| 09 67 000 5x76 | 22, 24, 26 | 6 |

| | a |
|---|---|
| AWG 22-18 | 1.34 |
| AWG 24-20 | 1.13 |
| AWG 26-22 | 0.88 |





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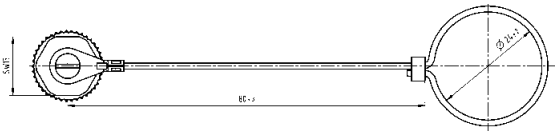
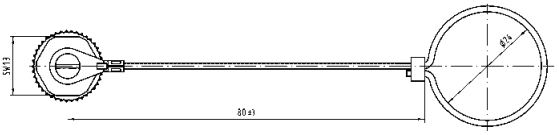
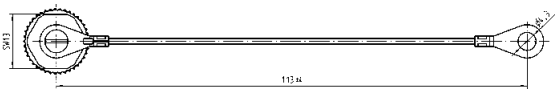
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Cap metal M12<br>for IP65 / 67<br>M12 metal cap for male side<br>with cord<br> | 21 01 000 0033 |  | |
| Cap metal M12<br>for IP65 / 67<br>M12 metal cap for male side<br>with cable clip<br> | 21 01 000 0038 | | |
| Cap metal M12<br>for IP65 / 67<br>M12 metal cap for female side<br>with cord<br> | 21 01 000 0030 |  | |
| Cap metal M12<br>for IP65 / 67<br>M12 metal cap for female side<br>with cable clip<br> | 21 01 000 0031 |  | |



Further information and data sheets see www.HARTING.com

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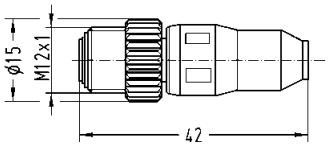
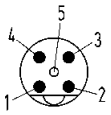
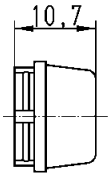
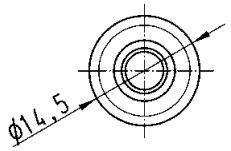
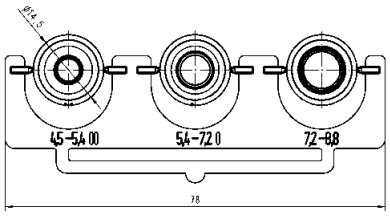
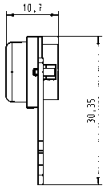
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12-male<br>moving load<br>B-coding | 21 03 030 1300 |   | |
| HARTING M12 T-Coupler | 21 03 341 6401 | | |
| Seal M12-L unshielded<br>for 4.7 - 6 mm cable Ø<br>for 6 - 8 mm cable Ø | 21 01 010 2015<br>21 01 010 2007 |   | |
| Set of seals M12-L shielded<br>for 4.5 - 5.4 mm cable Ø<br>for 5.4 - 7.2 mm cable Ø<br>for 7.2 - 8.8 mm cable Ø | 21 01 010 2017 |   | |
| Accessories M12<br><br>Lock nut | 21 01 000 0018 | | |



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# Notes





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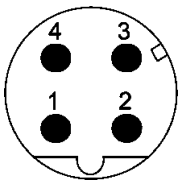
**Specifications** IEC 60352-4

**Approval**

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101



## Technical characteristics M12 – D-coding

| Type M12 D-coded | *HARAX*® M12 L shielded | M12 Crimp | M12 preLink® |
|---|---|---|---|
| **General data** | | | |
| Conductor cross section | 0.14 - 0.34 mm²<br>AWG 26-22<br>0.34 - 0.5 mm²<br>AWG 22-20 | 0.13 - 0.75 mm²<br>AWG 26-18 | 0.10 - 0.34 mm²<br>AWG 27-22 |
| Diameter of individual strands | ≥ 0.1 mm | X | ≥ 0.1 mm |
| Conductor insulation material | PVC/PE | X | PVC/PE |
| Conductor diameter | 1.2 - 2.0 mm | 2.0 - 2.3 mm | 0.8 - 1.6 mm |
| Cable diameter | 4.5 - 8.8 mm | 4 poles: 4.5 - 8.8 mm<br>5 poles: 4.5 - 8.8 mm | 6.3 - 6.7 mm |
| Temperature range | -40 °C … +85 °C | -40 °C … +85 °C | -40 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C | -5 °C … +50 °C | – |
| Degree of protection | IP65 / 67 | IP67 | IP65 / IP67 |
| Mating cycles | 100 | 500 | 250 |
| Tightening torque connector / Hexagonal wrench | 0.6 Nm / SW 17 | 0.6 Nm / SW 17 | 0.6 Nm / SW 17 |
| **Electrical characteristics** | | | |
| Rated current | 4 A | 4 A | 1 A |
| Rated voltage | 50 V | 250 V | 48 V |
| Rated impulse voltage | 1.5 kV | 1.5 kV | 1.5 kV |
| Contact resistance | 10 mΩ | 10 mΩ | 10 mΩ |
| Insulation resistance | $10^8$ Ω | $10^8$ Ω | $10^8$ Ω |
| Pollution degree | 3 | 3 | 3 |
| Overvoltage category | 3 | 3 | 3 |
| Isolation group | 1 | 1 | – |
| Transmission performance (Category) | Cat. 5 | Cat. 5 | Cat. 5 |
| **Materials** | | | |
| Contact material | Brass | Brass | Brass |
| Contact plating | Gold | Gold | Gold |
| Contact carrier material | PA unreinforced | PA | – |
| Housing material | PA unreinforced | PA | Zinc die-cast |



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## Technical characteristics M12 – D-coding

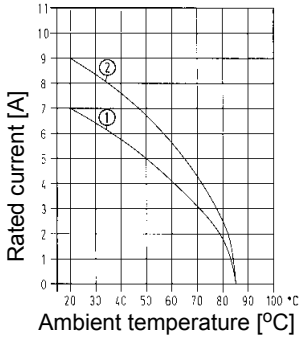
**Current carrying capacity**

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interruptet current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512-5.

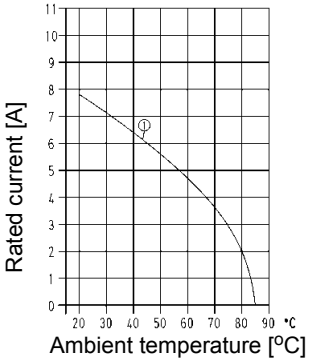
M12-L
3 poles, 4 poles

1 = Wire gauge 0.34 mm²
2 = Wire gauge 0.75 mm²



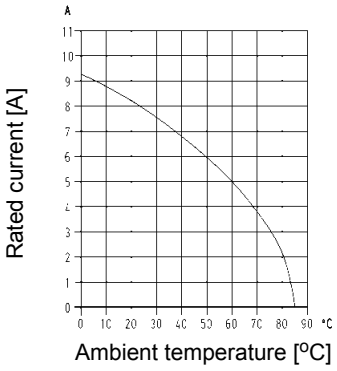

M12, Crimp

1 = Wire gauge 0.34 mm² / 0.5 mm²

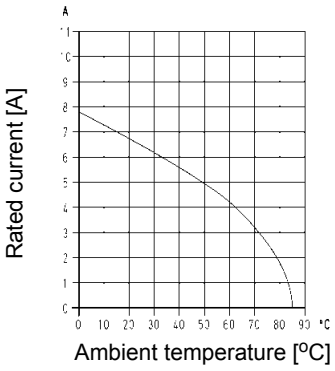



## Technical characteristics M12 – D-coding, PCB adapter

M12, D-coding, straight, female, 4 poles
Wire gauge 0.5 mm²




M12, D-coding, angled, female, 4 poles
Wire gauge AWG 22






Further information and data sheets see www.HARTING.com

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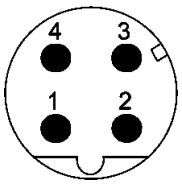
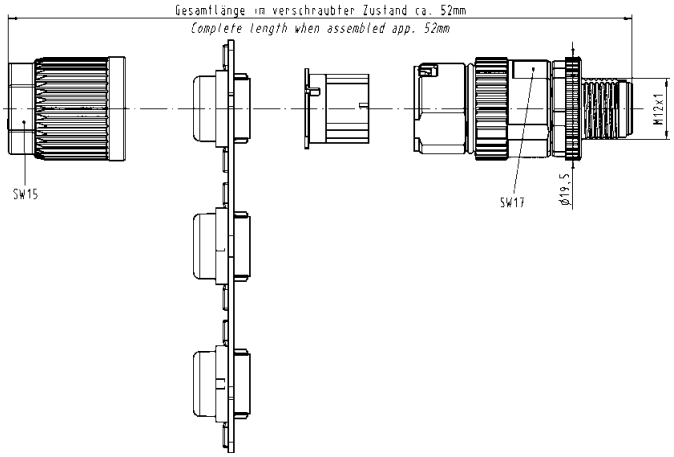
Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

## Applications / Advantages

- D-coding for Ethernet/Profinet applications
- Robust design
- 360° shielding termination
- Transmission performance Cat. 5

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12-L, shielded<br> <br>Male<br>4 poles, D-coding<br>0.14 - 0.34 mm², AWG 26 - 22 | 21 03 281 1405 |  | |
| Male<br>4 poles, D-coding<br>0.34 - 0.5 mm², AWG 22 - 20 | 21 03 282 1405 | | |



Further information and data sheets see www.HARTING.com

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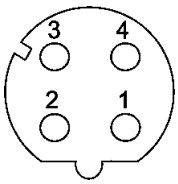
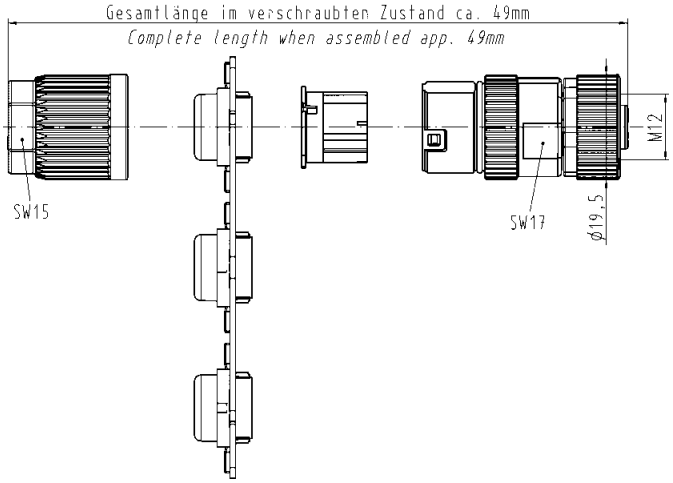
Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| ***HARAX*® M12-L, shielded**<br> | |  | |
| Female<br>4 poles, D-coding<br>0.14 - 0.34 mm², AWG 26 - 22 | 21 03 281 2405 | | |
| Female<br>4 poles, D-coding<br>0.34 - 0.5 mm², AWG 22 - 20 | 21 03 282 2405 | | |





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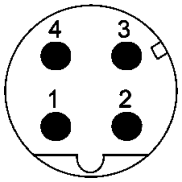
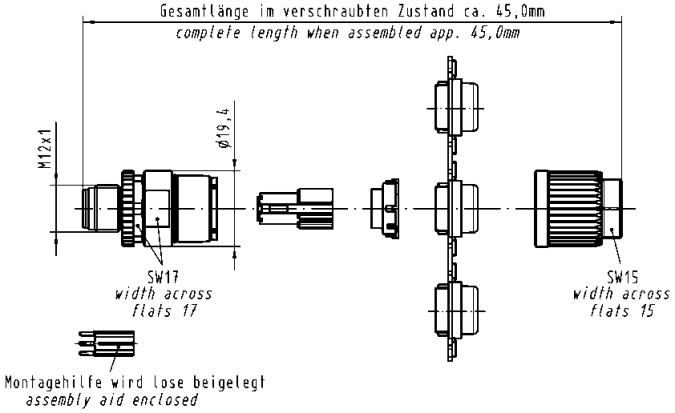
# M12 Crimp D-coded

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Crimp, shielded<br> <br>Male<br>4 poles, D-coding | 21 03 882 1415 |  | |





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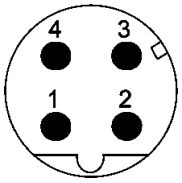
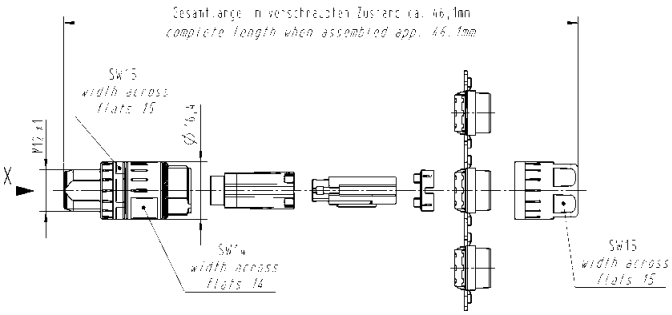
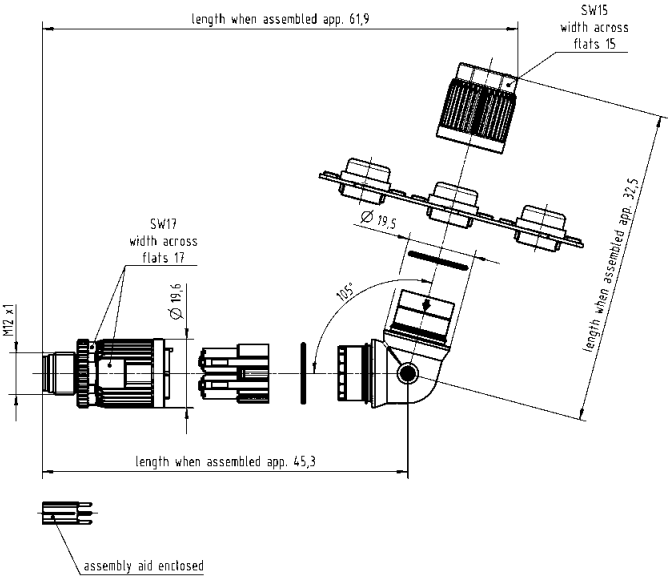
# M12 Crimp D-coded

Mating face




D-coding
Mating face
acc. to IEC 61 076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 Crimp Slim design, shielded**<br> <br>Male<br>4 poles, D-coding<br>Cable: 5.7 - 8.8 mm<br>outer diameter | 21 03 881 1405* |  | |
| **M12 Crimp, shielded**<br> <br>Male<br>4 poles, D-coding<br>angled | 21 03 882 3405* |  | |

Further information and data sheets see www.HARTING.com
* UL approval is in preparation



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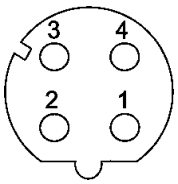
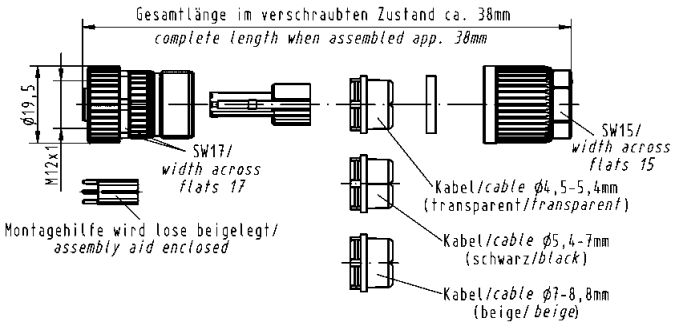
# M12 Crimp D-coded

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Crimp, shielded<br> <br>Female<br>4 poles, D-coding | 21 03 882 2405 |  | |





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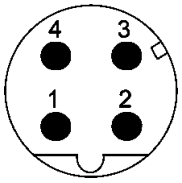
# M12 preLink® D-coded

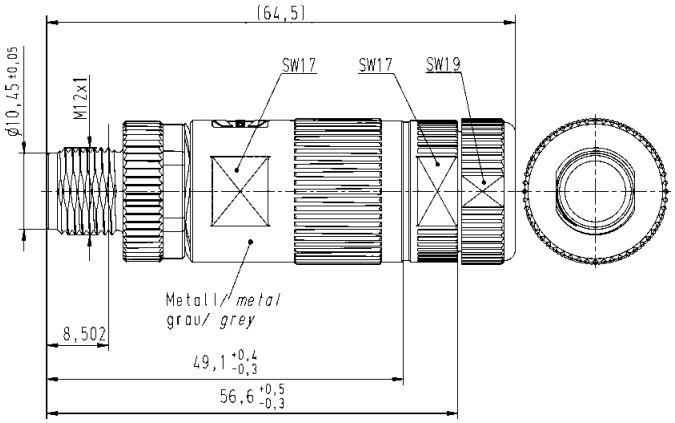
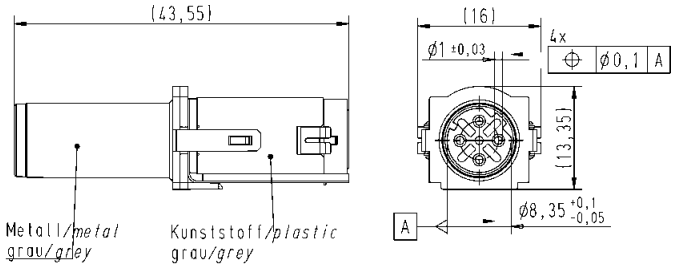
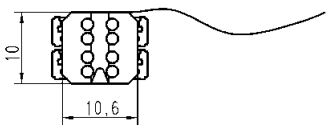
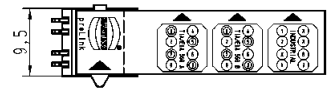
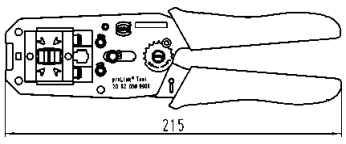
Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| preLink® M12 housing<br> | 20 82 000 1210 |  | |
| preLink® M12 male module<br>Male<br>4 poles, D-coding<br> | 20 82 005 1214 |  | |
| preLink® terminal module<br>(Pack with 10 pieces)<br>terminal block with IDC termination<br>Number of contacts: 8<br>Conductor cross section: AWG 22/23 (24) solid and stranded<br>Conductor diameter: Ø 1.3 - 1.6 mm<br>Colour: yellow | 20 82 000 0001 |  | |
| Conductor cross section: AWG 26/27 solid and stranded<br>Conductor diameter: Ø 0.8 - 1.1 mm<br>Colour: white | 20 82 000 0003 |  | |
| Assembly tool | 20 82 000 9901 |  | |



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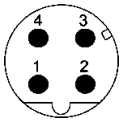
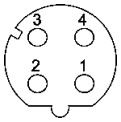
# M12 System cables, D-coding, 4 poles




Male, 4 poles

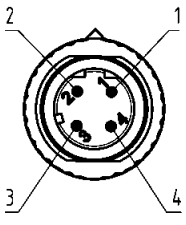


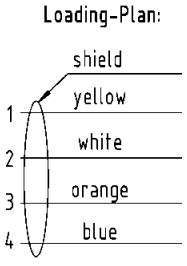

Female, 4 poles

## Technical characteristics

System cables with M12 circular connectors shielded, D-coding

| | 4 poles | |
|---|---|---|
| | PVC | PUR |
| Rated voltage | max. 160 V AC/DC | max. 160 V AC/DC |
| Rated currrent / contact | max. 4 A at +40 °C | max. 4 A at +40 °C |
| Screw locking | M12x1, self securing | M12x1, self securing |
| Recommended torque | 0.6 Nm | 0.6 Nm |
| Temperature range (working and storage) | -30 °C … +80 °C | -30 °C … +80 °C |
| Degree of protection | IP67 | IP67 |
| Number of wires / wire gauge | 4 x 0.34 mm² | 4 x 0.34 mm² |
| Conductor insulation | PE (ye, wh, og, bu) | PE (ye, wh, og, bu) |
| Arrangement of insulated strands | 7 x Ø 0.25 mm (AWG 22) | 7 x Ø 0.25 mm (AWG 22) |
| Sheath | PVC | PUR (UL, CSA) |
| Sheath colour | green | green |
| Outer diameter | Ø 6.5 ± 0.2 mm | Ø 6.5 ± 0.2 mm |
| Useable as trailing cable | no | yes |
| Halogen free acc. to | – | IEC 60754 |
| Flame retardant acc. to | UL 1685 (CSA FT4) | IEC 60332-1-2 und UL 2556 VW1 |
| Oil-resistant | IEC 80811-2-1 (4h/70°C) | IEC 60811-2-1 und UL13 |



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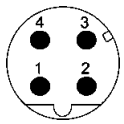
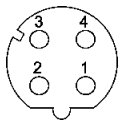
# M12 System cables, D-coding, 4 poles




Male, 4 poles




Female, 4 poles

## Part number definition

| 2 | 1 | 3 | 4 | X | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Connector 1**
92 Male straight
93 Female straight
94 Male angled
95 Female angled

**Connector 2**
00 No connector
92 Male straight
93 Female straight
94 Male angled
95 Female angled

**Number of contacts**
4 4 poles

**Cable material**
05 PVC
77 PUR

**Preferred length***
005 0.5 m
010 1.0 m
015 1.5 m
020 2.0 m
050 5.0 m
075 7.5 m
100 10.0 m

* Other length on request



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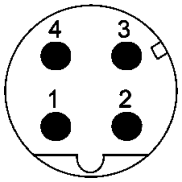
# M12 Panel feed-through *HARAX*® D-coded

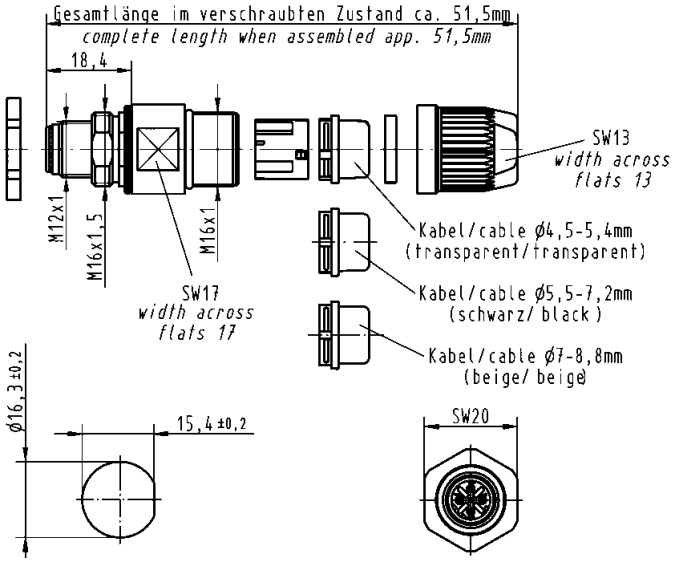
Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

## Applications / Advantages

- D-coding for Ethernet/Profinet apllications
- Patent *HARAX*® fast termination
- Robust design
- 360° shielding termination
- Transmission performance Cat. 5

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® Panel feed-through<br> <br>Male<br>4 poles, D-coding<br>0.14 - 0.34 mm² / AWG 26 - 22<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 381 1425 |  | |



Further information and data sheets see www.HARTING.com

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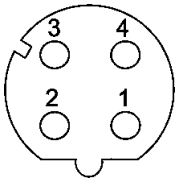
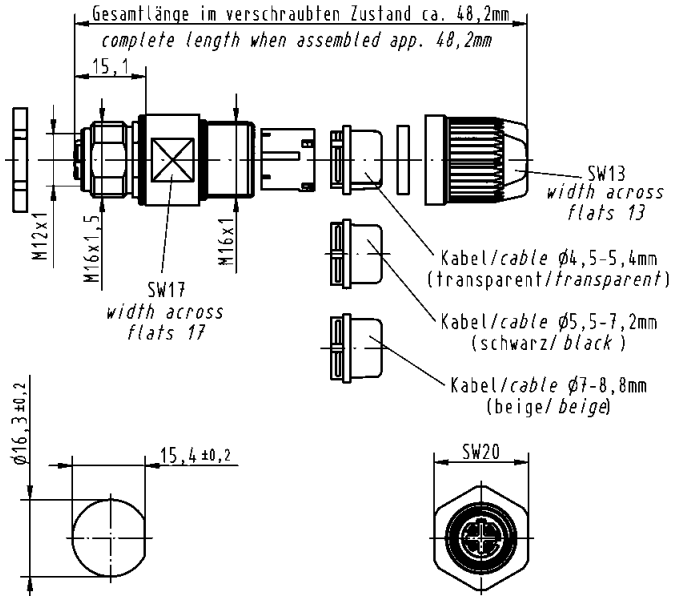
# M12 Panel feed-through *HARAX*® D-coded

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® Panel feed-through<br> <br>Female<br>4 poles, D-coding<br>0.14 - 0.34 mm² / AWG 26 - 22<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 381 2425 |  | |





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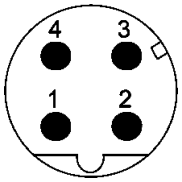
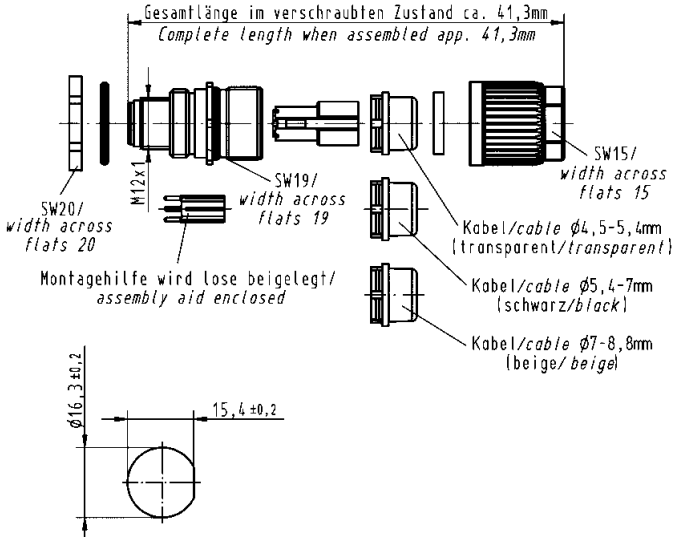
# M12 Panel feed-through Crimp D-coded

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through Crimp<br> <br>Male<br>4 poles, D-coding<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 882 1425 |  | |



Further information and data sheets see www.HARTING.com

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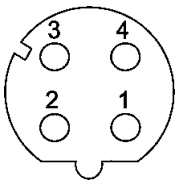
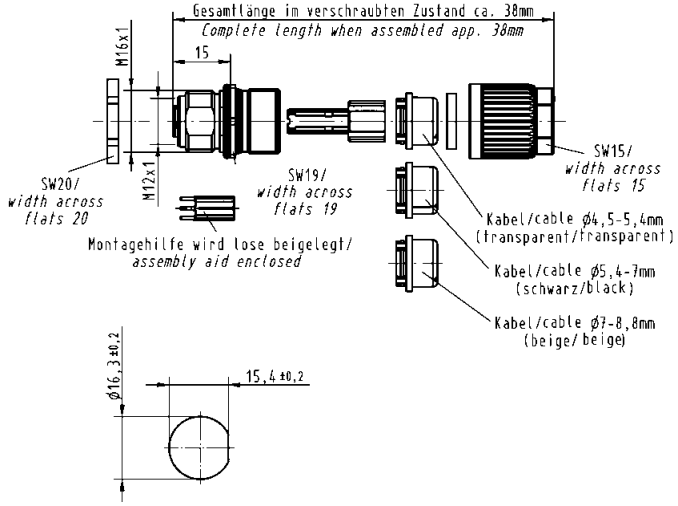
# M12 Panel feed-through Crimp D-coded

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through Crimp<br> <br>Female<br>4 poles, D-coding<br><br>Panel thickness<br>min. 2.5 mm<br>max. 4.5 mm | 21 03 882 2425 |  | |



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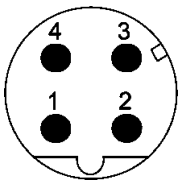
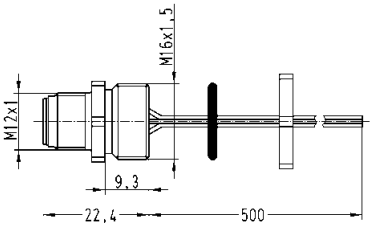
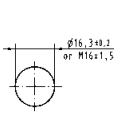
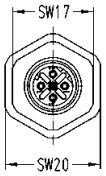
# M12 Panel feed-through D-coded

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through<br> <br>Male<br>D-coding<br>50 cm conductors, AWG 22, 4 poles<br><br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 371 1403 |  <br><br>  <br><br>  <br> | |



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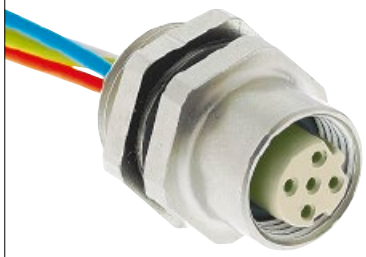
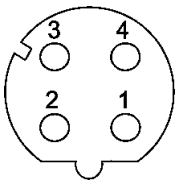
Downloaded from Arrow.com.

# M12 Panel feed-through D-coded



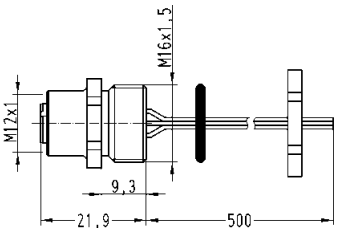
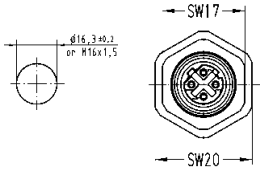
Mating face




D-coding
Mating face
acc. to IEC 61 076-2-101

RoHS



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Panel feed-through<br> <br>Female<br>D-coding<br>50 cm conductors, AWG 22, 4 poles<br><br>Panel thickness<br>min. 2.0 mm<br>max. 5.0 mm | 21 03 371 2403 |  |  |



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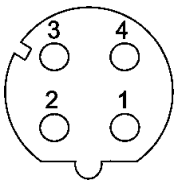
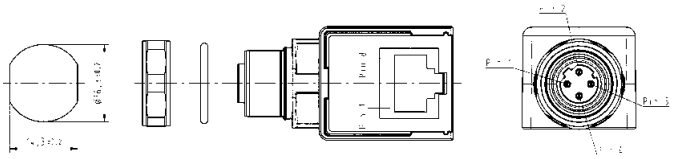
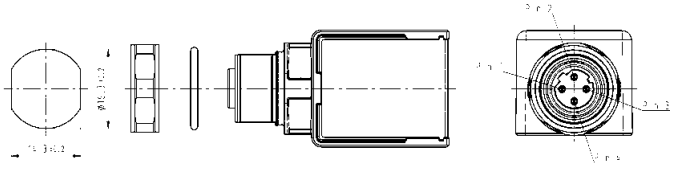
# M12 Panel feed-through D-coded

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Female-RJ45<br>Panel feed-through<br> <br>4 poles, D-coding<br>angled<br><br>Panel thickness<br>min. 2.1 mm<br>max. 4.5 mm | 21 03 381 4401* |  | |
| M12 Female-RJ45<br>Panel feed-through<br> <br>4 poles, D-coding<br>straight<br><br>Panel thickness<br>min. 2.1 mm<br>max. 4.5 mm | 21 03 381 2401* |  | |



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* UL approval is in preparation

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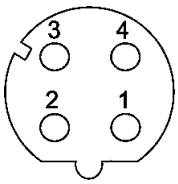
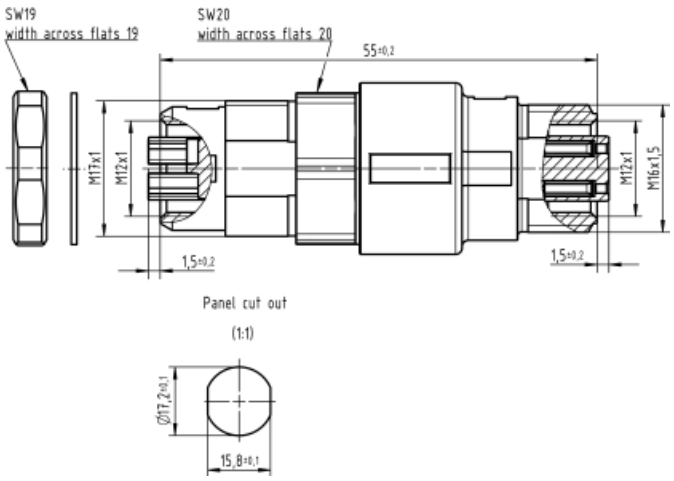
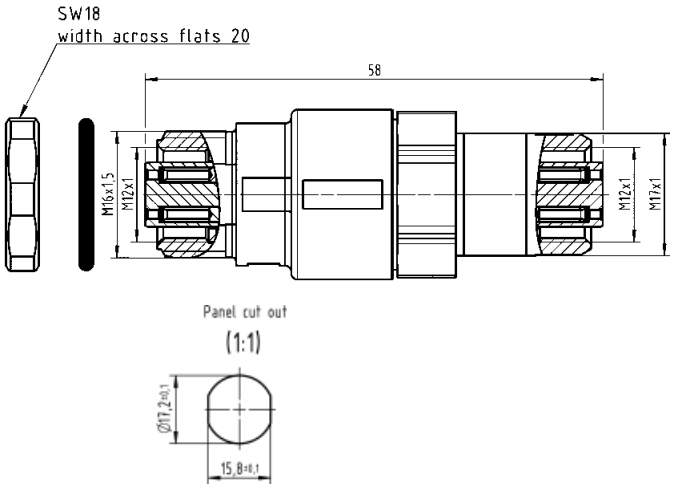
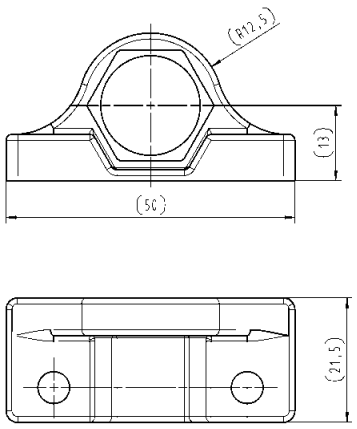
# M12 Panel feed-through D-coded

Mating face




D-coding
Mating face
acc. to IEC 61 076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Gender Changer Female-Female<br><br>4 poles, D-coding<br>8 poles, X-coding | 21 03 381 6402* |  | |
| M12 Gender Changer Female-Female<br><br> <br><br>4 poles, D-coding<br>Cat. 5 | 21 03 381 6401* |  | |
| Wall bracket<br><br> | 21 01 000 0036 |  | |



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* UL approval is in preparation

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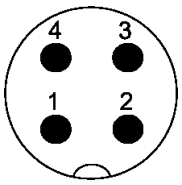
# M12 PCB adapter D-coded

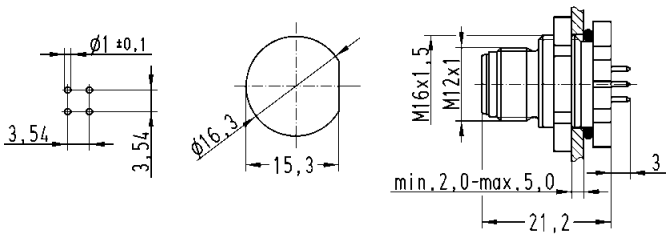
Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

## Technical characteristics: M12 PCB adapter D-coded angled

| | |
|---|---|
| Degree of protection | IP20, IP67 (mated and locked) |
| Rated current | max. 4 A (dependant on PCB layout) |
| Rated voltage | 50 V |
| Mating cycles | max. 100 |
| Limiting temperature | -40 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C |
| Termination | Reflow |
| Contact material | Copper alloy |
| Contact plating (mating side) | Au over Ni |
| Insulator material | LCP |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 PCB adapter<br>Male, D-coding, straight | | | |
| 4 poles, IP67 | 21 03 371 1400 |  | |





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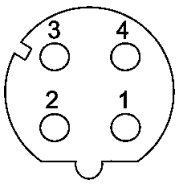
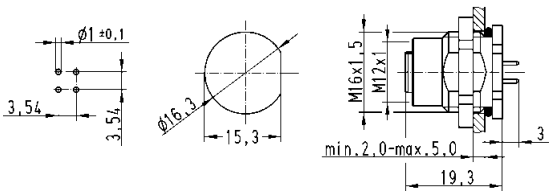
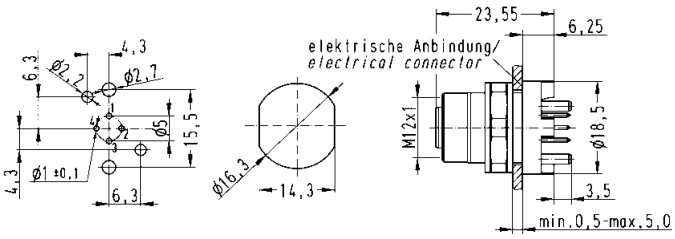
# M12 PCB adapter D-coded

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter**<br>Female, D-coding, straight | | | |
| <br>4 poles, IP67 | 21 03 371 2415 |  | |
| <br>4 poles, IP20<br>4 poles, IP67 | 21 03 381 6410<br>21 03 381 6420 |  | |



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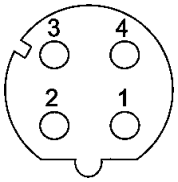
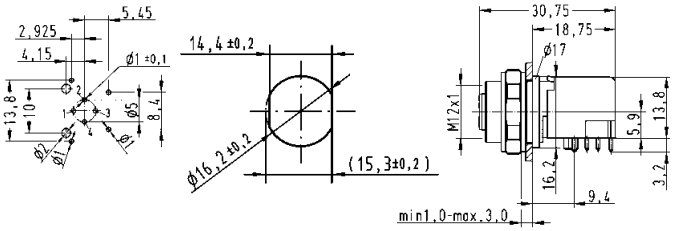
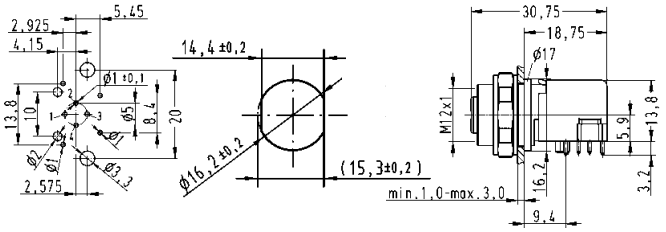
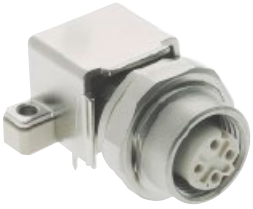
# M12 PCB adapter D-coded

Mating face

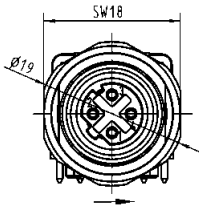



D-coding
Mating face
acc. to IEC 61076-2-101

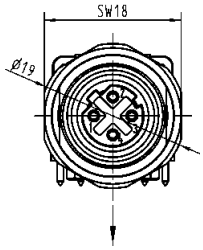
RoHS

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **M12 PCB adapter**<br>Female, D-coding, angled, 4 poles | | | | |
| without fixing hole | IP20 | 21 03 381 4410 [1] |  | |
| | IP20 | 21 03 381 4411 [2] | | |
| | IP67 | 21 03 381 4430 [1] | | |
| with fixing hole | IP20 | 21 03 381 4412 [1] |  | |
| | IP20 | 21 03 381 4413 [2] | | |
|  | IP67 | 21 03 381 4432 [1] | | |

[1] Cable direction to the right




[2] Cable direction to the bottom



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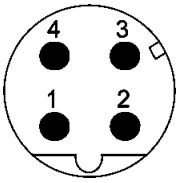
# M12 PCB adapter shielded D-coded

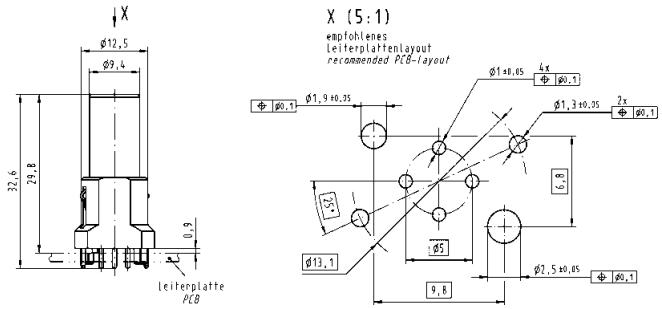
Mating face

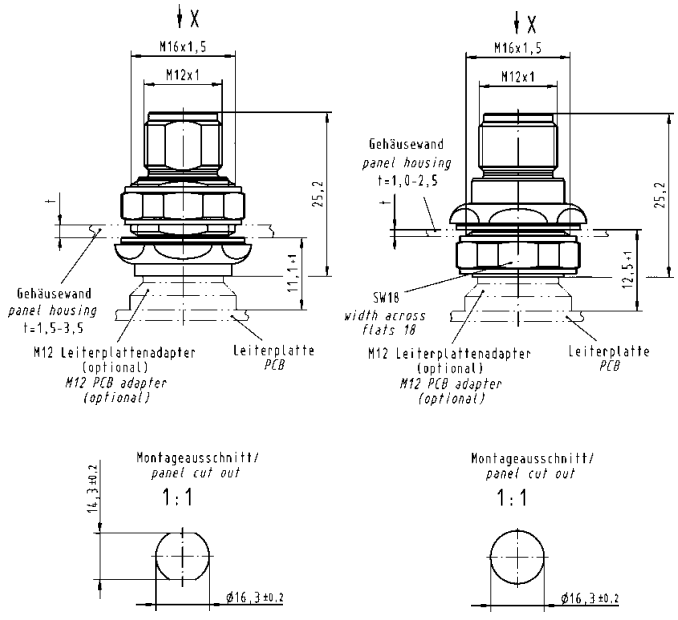



D-coding
Mating face
acc. to IEC 61076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter, shielded** | | | |
| **Packaging: 60 pieces in a tray**<br>**Order housing separately** | | | |
| Male<br>4 poles, D-coding | 21 03 381 1418* | | |
| **Packaging: 1 piece incl. housing** | | | |
| Male<br>4 poles, D-coding, rear mounting<br>4 poles, D-coding, front mounting | 21 03 381 1430*<br>21 03 381 1431* | | |
| **Housing** | | | |
| **Packaging: 10 pieces in a tube** | | | |
| for rear mounting | 21 03 301 1000 | | |
| for front mounting | 21 03 301 1001 | | |






Further information and data sheets see www.HARTING.com
* UL approval is in preparation

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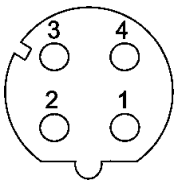
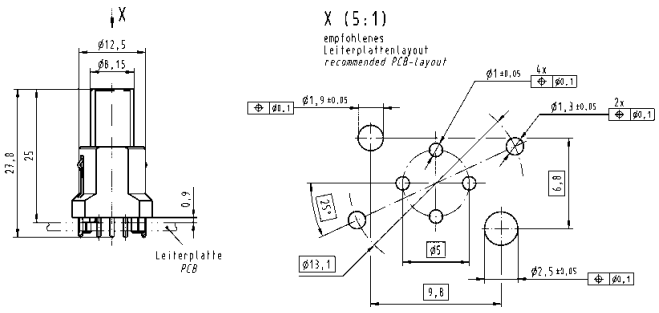
# M12 PCB adapter shielded D-coded

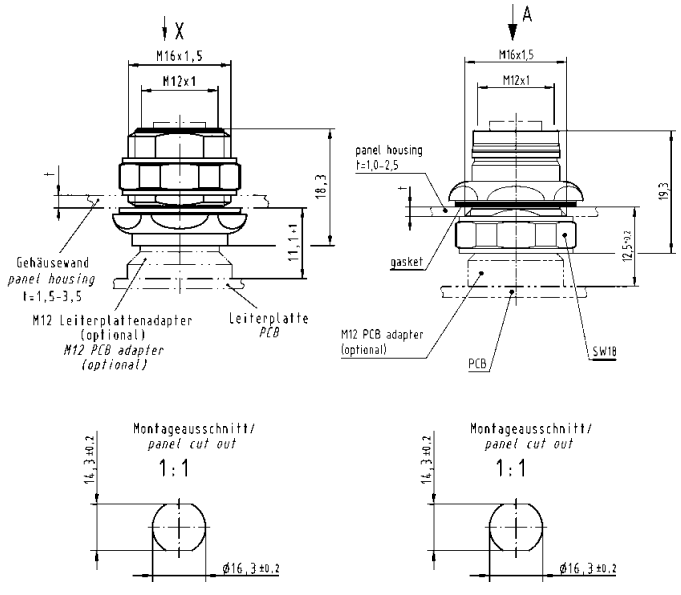
Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter, shielded** | | | |
| **Packaging: 60 pieces in a tray**<br>**Order housing separately** | | | |
| Female<br>4 poles, D-coding | 21 03 381 2418* | | |
| **Packaging: 1 piece incl. housing** | | | |
| Female<br>4 poles, D-coding, rear mounting | 21 03 381 2430* | | |
| 4 poles, D-coding, front mounting | 21 03 381 2431* | | |
| **Housing** | | | |
| | | | |
| **Packaging: 10 pieces in a tube** | | | |
| for rear mounting | 21 03 301 2000 | | |
| for front mounting | 21 03 301 2003 | | |

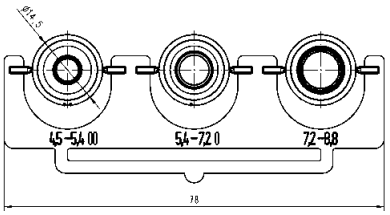
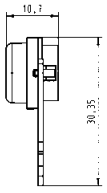




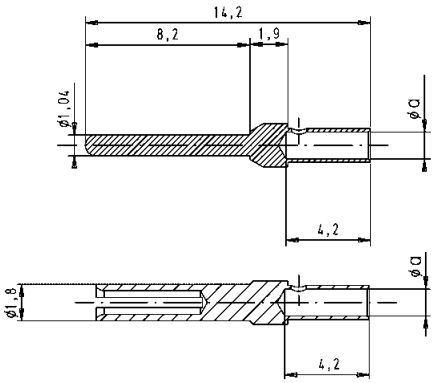

Further information and data sheets see www.HARTING.com
* UL approval is in preparation

Downloaded from Arrow.com.

| Identification | Part number | Drawing |
|---|---|---|
| **Crimping tool**<br>for M12 Crimp | 09 99 000 0501 | |
| **Accessories M12 Crimp** | | |
| **Locator** | 09 99 000 0531 | |
| **D-Sub single contacts (500 mating cycles)** | | |
| turned male contacts | | |
| AWG 22-18 / 0.33-0.82 mm² | 09 67 000 3576 | |
| AWG 24-20 / 0.25-0.52 mm² | 09 67 000 8576 | |
| AWG 26-22 / 0.13-0.33 mm² | 09 67 000 5576 | |
| AWG 28-24 / 0.09-0.25 mm² | 09 67 000 7576 | |
| turned female contacts | | |
| AWG 22-18 / 0.33-0.82 mm² | 09 67 000 3476 | |
| AWG 24-20 / 0.25-0.52 mm² | 09 67 000 8476 | |
| AWG 26-22 / 0.13-0.33 mm² | 09 67 000 5476 | |
| AWG 28-24 / 0.09-0.25 mm² | 09 67 000 7476 | |
| **M12 dynamometric screwdriver**<br>Tightening torque 0.6 Nm | | |
| for M12 Slim design SW 15 | 09 99 000 0646 | |
| for M12-L SW 17 | 09 99 000 0384 | |
| **Set of seals M12-L shielded**<br>for 4.5 - 5.4 mm cable Ø<br>for 5.4 - 7.2 mm cable Ø<br>for 7.2 - 8.8 mm cable Ø | 21 01 010 2017 |   |
| **Accessories M12** | | |
| **Lock nut** | 21 01 000 0018 | |

D-Sub contacts

| Part number | AWG | Tool settings |
|---|---|---|
| 09 67 000 3x76 | 18 | 6 |
| | 20 | 6 |
| | 22 | 5 |
| 09 67 000 8x76 | 20, 22, 24 | 6 |
| 09 67 000 5x76 | 22, 24, 26 | 6 |




| | a |
|---|---|
| AWG 22-18 | 1.34 |
| AWG 24-20 | 1.13 |
| AWG 26-22 | 0.88 |





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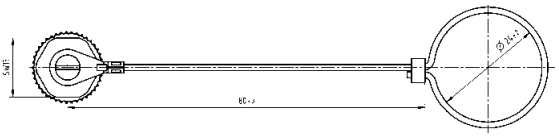
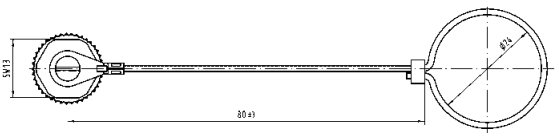
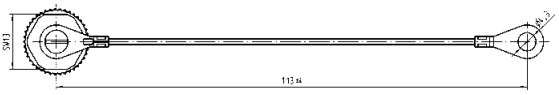
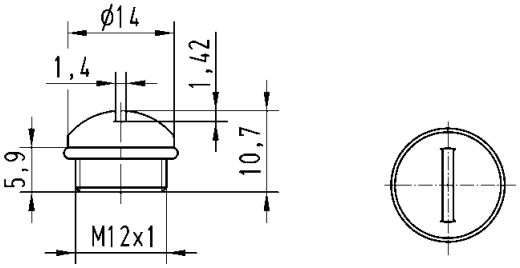
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cap metal M12**<br>for IP65 / 67<br>M12 metal cap for male side<br>with cord<br> | 21 01 000 0033 |  | |
| **Cap metal M12**<br>for IP65 / 67<br>M12 metal cap for male side<br>with cable clip<br> | 21 01 000 0038 | | |
| **Cap metal M12**<br>for IP65 / 67<br>M12 metal cap for female side<br>with cord<br> | 21 01 000 0030 |  | |
| **Cap metal M12**<br>for IP65 / 67<br>M12 metal cap for female side<br>with cable clip<br> | 21 01 000 0031 |  | |
| **Cap M12**<br>for IP65 / 67<br>Seals material Viton<br>Plastic cap for female<br> | 21 01 000 0003 |  | |



Further information and data sheets see www.HARTING.com

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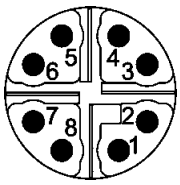
**Specifications** IEC 60 352-4

**Approval**

Mating face




X-coding
Mating face
acc. to IEC 61 076-2-109



## Technical characteristics M12 – X-coding

| **Type M12 X-coded** | ***har*-speed M12**<br>***har*-speed M12 Slim design** |
|---|---|

**General data**

| | |
|---|---|
| Conductor cross section | 0.08 - 0.25 mm²<br>AWG 28-23 |
| Diameter of individual strands | – |
| Conductor insulation material | – |
| Conductor diameter | 0.33 - 0.61 mm |
| Cable diameter | 5.7 - 8.8 mm |
| Temperature range | -40 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C |
| Degree of protection | IP65 / 67 |
| Mating cycles | 500 |
| Tightening torque connector / hexagonal wrench | 0.6 Nm / SW 15 |

**Electrical characteristics**

| | |
|---|---|
| Rated current | 0.5 A |
| Rated voltage | 48 V |
| Rated impulse voltage | 0.8 kV |
| Contact resistance | 15 mΩ |
| Insulation resistance | $10^8$ Ω |
| Pollution degree | 3 |
| Overvoltage category | 3 |
| Isolation group | 1 |
| Transmission performance (Category) | Cat. $6_A$ |

**Materials**

| | |
|---|---|
| Contact material | Brass |
| Contact plating | Gold |
| Contact carrier material | LCP |
| Housing material | ZP410 |



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* UL approval is in preparation

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## Technical characteristics M12 – X-coding

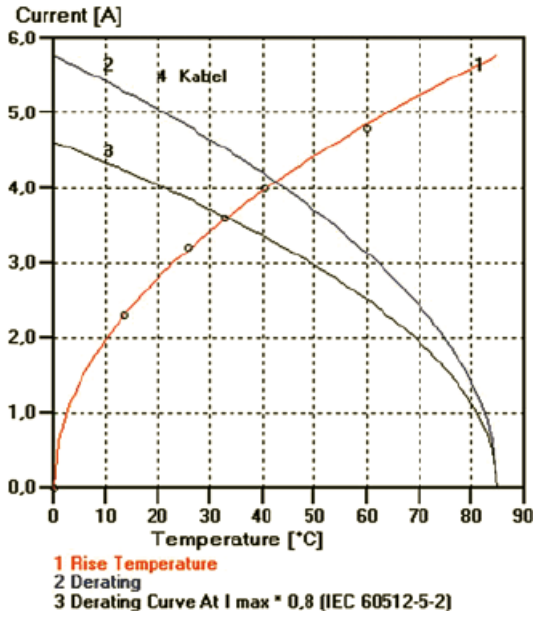


**Current carrying capacity**

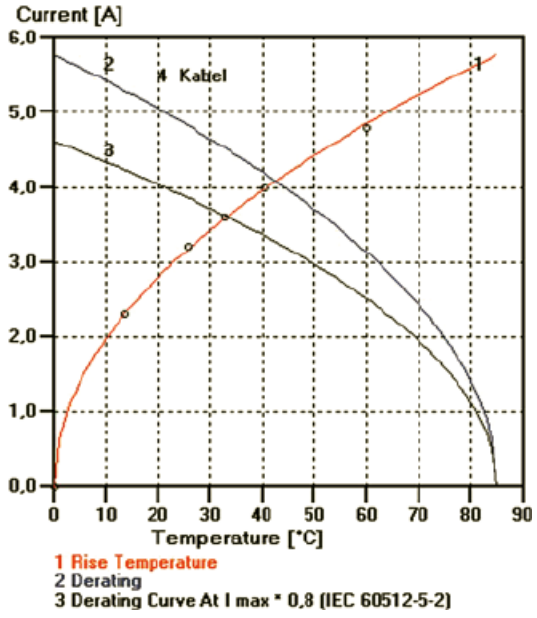
The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interruptet current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60512-9-1.

*har*-speed M12
8 poles




*har*-speed M12
PCB adapter





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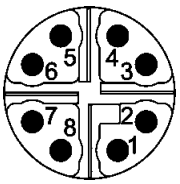
Mating face



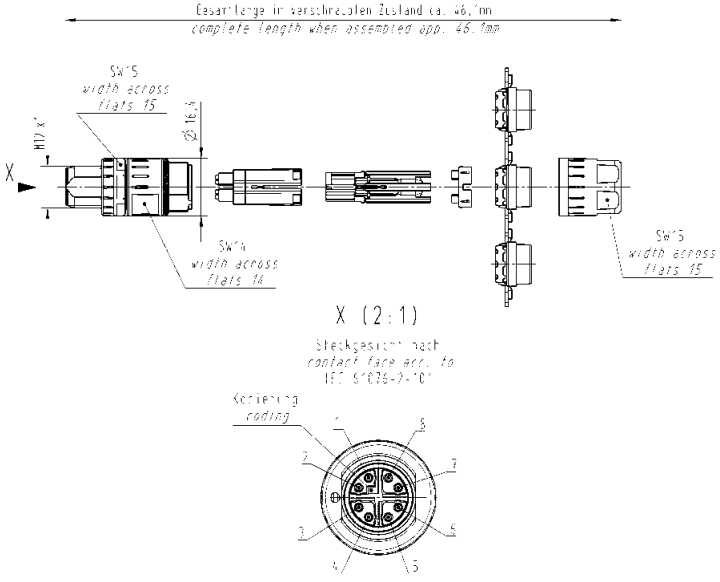

X-coding
Mating face
acc. to IEC 61076-2-109

RoHS



## Applications / Advantages

- High-Speed Ethernet applications for process automatization, e.g. camera system for process control in the production
- Maxiumum data rates through the configuration of the contacts in conformance with Ethernet technology. Transfer class $E_A$ for 1 and 10 Gigabit
- Perfect shielding through paired shielding of the contacts
- Overmoulded system cables in various lengths

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *har*-speed M12 Slim design<br> <br>Male<br>straight version<br>8 poles, Cat. $6_A$<br>Cable diameter: 5.7 - 8.8 mm | 21 03 881 1805 |  | |



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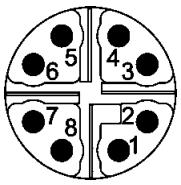
## Ha-VIS preLink® M12 connector X-coding

Mating face



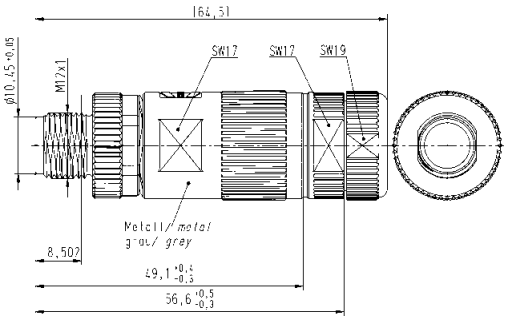
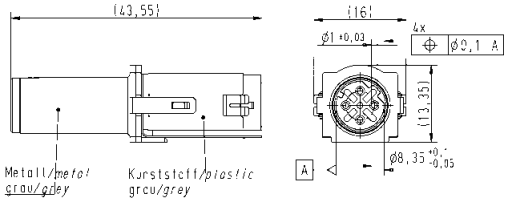

X-coding
Mating face
acc. to IEC 61 076-2-101

## Advantages

- M12 Ethernet-Data connector suitable for industry
- Robust design
- 360° shielding
- Category of transmission Cat. $6_A$
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

## Technical characteristics

| | |
|---|---|
| Connector type | M12 X-coding acc. to IEC 61 076-2-101 |
| Number of contacts | 8 |
| Transmission category | Category $6_A$, Class $E_A$, suitable for 1/10 Gigabit Ethernet |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | IDC termination |
| Cable termination for preLink® terminal module, yellow, 20 82 000 0001 | |
| Connectable cables | |
| – Conductor cross section | AWG 23 … AWG 22 (solid and stranded) |
| – Conductor diameter | 1.3 … 1.6 mm |
| Cable termination for preLink® terminal module, white, 20 82 000 0003 | |
| Connectable cables | |
| – Conductor cross section | AWG 27 … AWG 26 (solid and stranded) |
| – Conductor diameter | 0.8 … 1.1 mm |
| Cable diameter | 5 … 9 mm |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 750 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | Zinc die-cast, nickel-plated |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| preLink® M12 housing | 20 82 000 1210 |   | |
| preLink® M12 male module<br>Male<br>8 poles,<br>X-coding | 20 82 006 1218 |   | |
| preLink® M12 connector set<br>X-coding | 20 82 005 0002 | | |
| Ha-VIS preLink® RJ45 terminal module<br>AWG 22/23, yellow[1)]<br>AWG 26/27, white[1)] | <br>20 82 000 0001<br>20 82 000 0003 | | |
| Ha-VIS preLink® assembly tool | 20 82 000 9901 | | |

Further information and data sheets see www.HARTING.com

[1)] Packaging with 10 pieces



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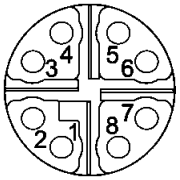
# *har*-speed M12 Panel feed-through X-coded

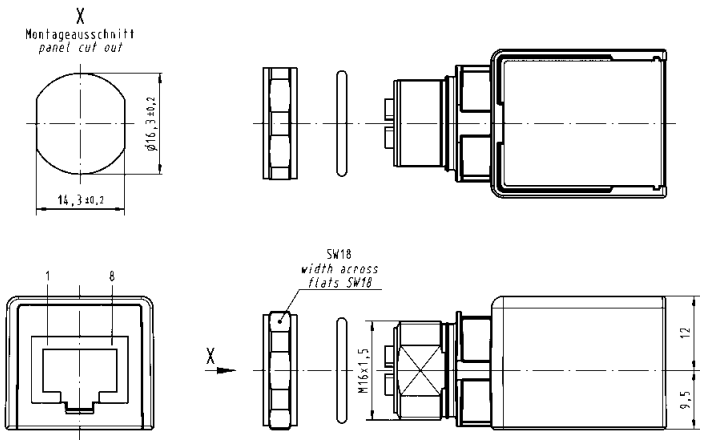
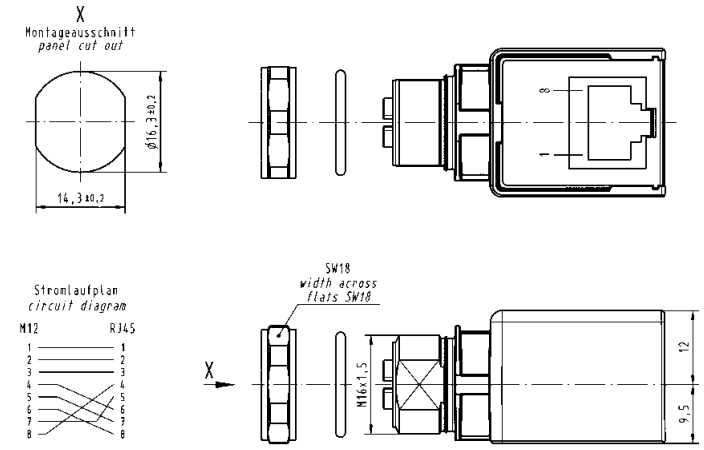
Mating face




X-coding
Mating face
acc. to IEC 61076-2-109

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *har*-speed M12<br>Adapter M12-RJ45 | | | |
| <br>straight, Cat. $6_A$<br><br>Panel thickness<br>min. 2.1 mm<br>max. 4.5 mm | 21 03 381 2800 |  | |
| <br>angled, Cat. $6_A$<br><br>Panel thickness<br>min. 2.1 mm<br>max. 4.5 mm | 21 03 381 4800 |  | |



Further information and data sheets see www.HARTING.com

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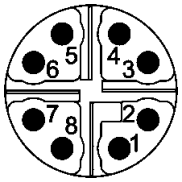
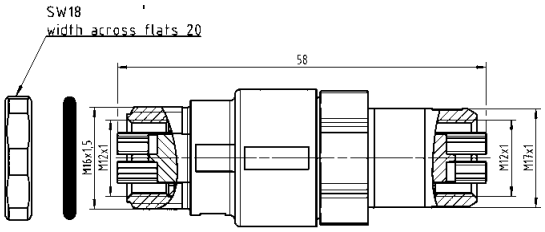
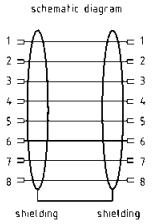
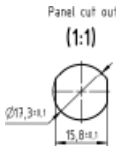
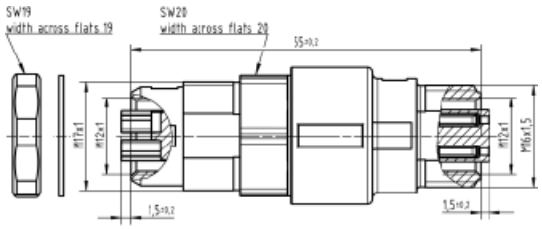
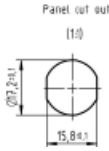
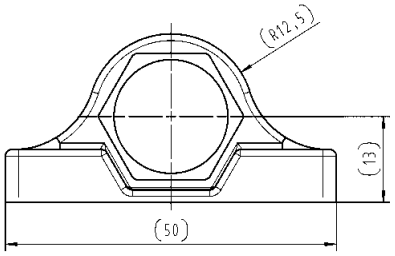
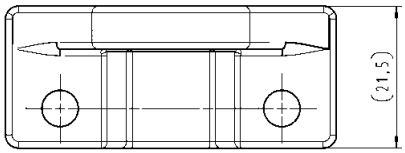
# *har*-speed M12 Panel feed-through X-coded

Mating face




X-coding
Mating face
acc. to IEC 61 076-2-109

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 Gender changer, Cat. $6_A$ | 21 03 381 6815 |       | |
| M12 Gender changer, Cat. 5 Female-Female<br>4 poles, D-coding<br>8 poles, X-coding | 21 03 381 6402 |     | |
| Wall bracket | 21 01 000 0036 |     | |



Further information and data sheets see www.HARTING.com

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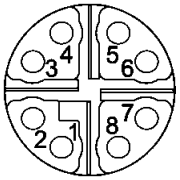
# *har*-speed M12 PCB adapter X-coded

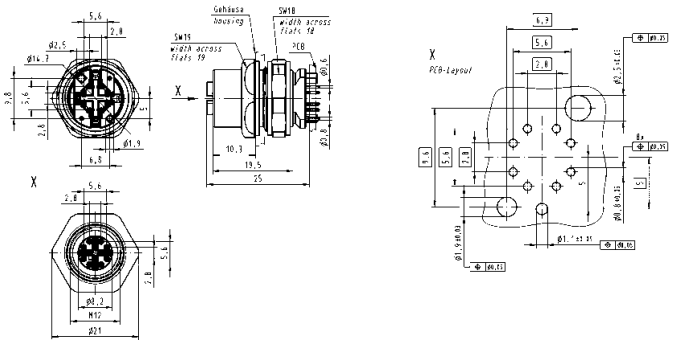
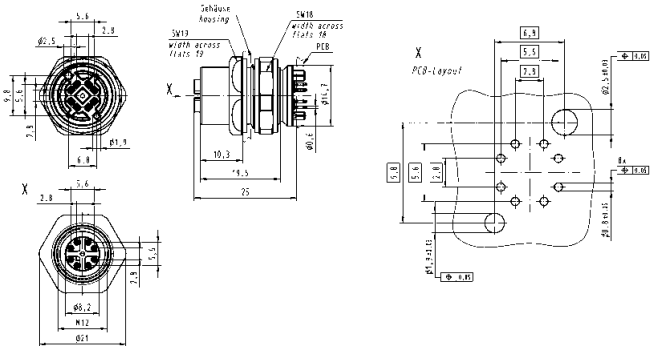
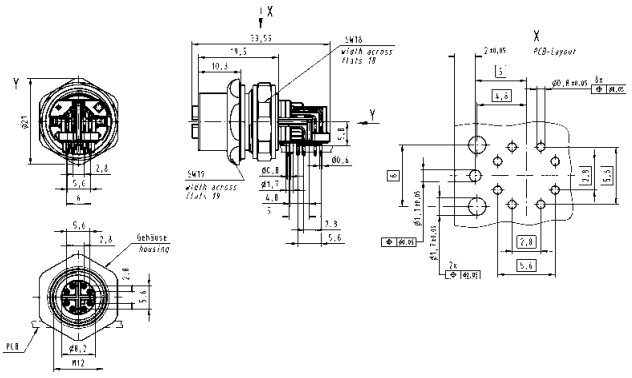
Mating face




X-coding
Mating face
acc. to IEC 61076-2-109

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| ***har*-speed M12 PCB adapter**<br>Female, X-coding, straight, Cat. $6_A$ for front mounting | |  | |
| **Packaging: 60 pieces incl. housing** | 21 03 381 2802 | | |
| **Packaging: 1 piece incl. housing** | 21 03 381 2813 | | |
| ***har*-speed M12 PCB adapter**<br>Female, X-coding, straight, Cat. 5 for front mounting | |  | |
| **Packaging: 60 pieces incl. housing** | 21 03 381 2803 | | |
| **Packaging: 1 piece incl. housing** | 21 03 381 2814 | | |
| ***har*-speed M12 PCB adapter**<br>Female, X-coding, angled, Cat. $6_A$ for front mounting | |  | |
| **Packaging: 30 pieces incl. housing** | 21 03 381 4802 | | |
| **Packaging: 1 piece incl. housing** | 21 03 381 4810 | | |



Further information and data sheets see www.HARTING.com

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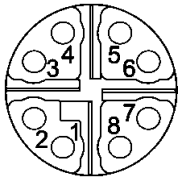
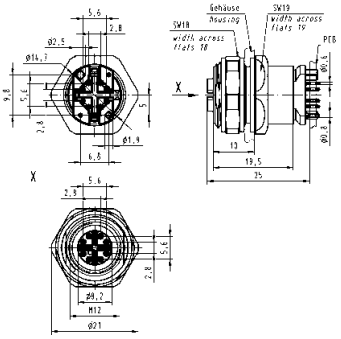
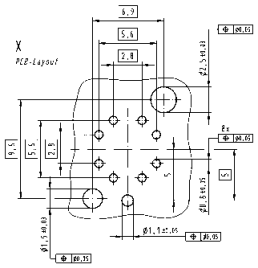
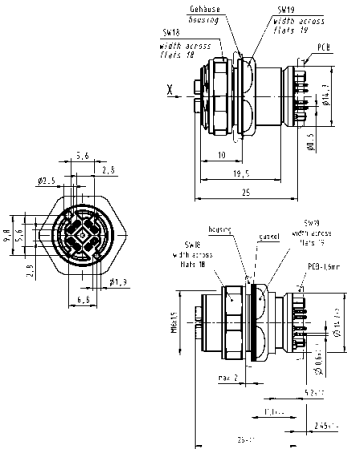
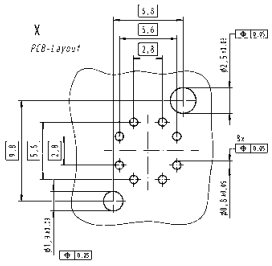
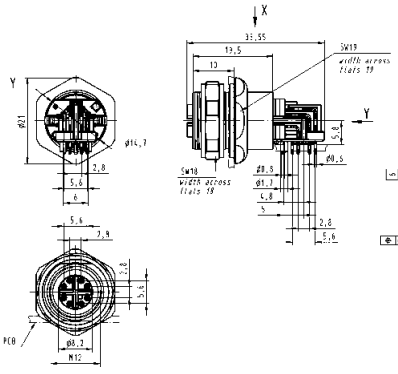
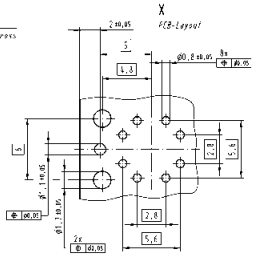
# *har*-speed M12 PCB adapter X-coded

Mating face




X-coding
Mating face
acc. to IEC 61076-2-109

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| ***har*-speed M12 PCB adapter**<br>Female, X-coding, straight, Cat. $6_A$ for rear mounting | |  |  |
| **Packaging: 60 pieces incl. housing** | 21 03 381 2804 | | |
| **Packaging: 1 piece incl. housing** | 21 03 381 2811 | | |
| ***har*-speed M12 PCB adapter**<br>Female, X-coding, straight, Cat. 5 for rear mounting | |  |  |
| **Packaging: 60 pieces incl. housing** | 21 03 381 2805 | | |
| **Packaging: 1 piece incl. housing** | 21 03 381 2812 | | |
| **Packaging: 60 piece incl. housing** | 21 03 381 2809 | | |
| ***har*-speed M12 PCB adapter**<br>Female, X-coding, angled, Cat. $6_A$ for rear mounting | |  |  |
| **Packaging: 30 pieces incl. housing** | 21 03 381 4804 | | |
| **Packaging: 1 piece incl. housing** | 21 03 381 4809 | | |



Further information and data sheets see www.HARTING.com

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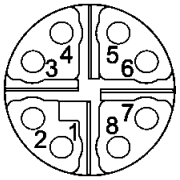
# *har*-speed M12 PCB adapter X-coded

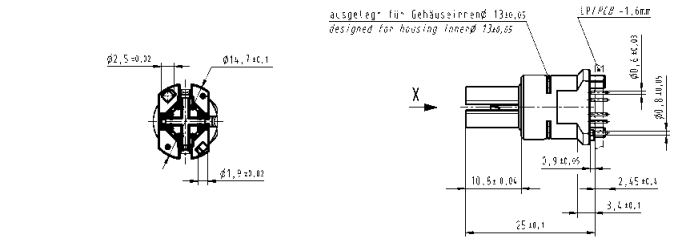
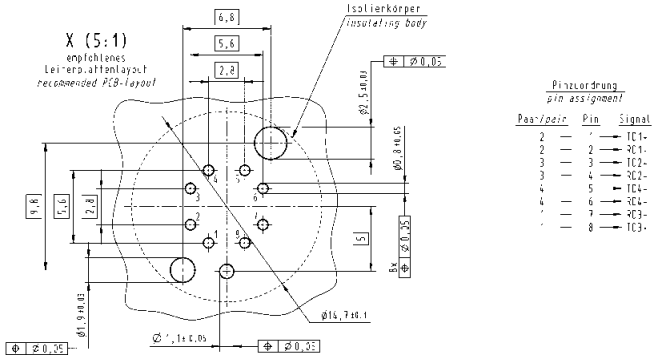
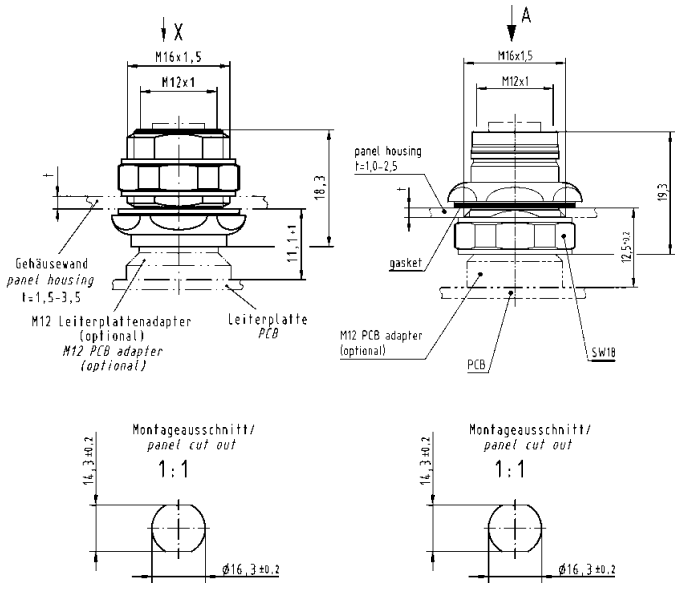
Mating face




X-coding
Mating face
acc. to IEC 61076-2-109

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| ***har*-speed M12 PCB adapter**<br><br>**Packaging: 60 pieces in a tray**<br>**Order housing separately** | |  | |
| Female<br>8 poles, X-coding<br>Cat. $6_A$ | 21 03 381 2806 |  | |
| Female<br>8 poles, X-coding<br>Cat. 5 | 21 03 381 2807 | | |
| **Housing**<br><br>**Packaging: 10 pieces in a tube** | |  | |
| for rear mounting | 21 03 301 2000 | | |
| for front mounting | 21 03 301 2003 | | |



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| Identification | Part number | Drawing |
|---|---|---|
| Crimping tool<br>for *har*-speed M12 | 09 99 000 0501 | |
| Accessories *har*-speed M12 | | |
| Locator | 09 99 000 0525 | |
| Single contacts<br>(500 mating cycles) | | |
| *har*-speed M12 contacts<br>AWG 28-24 / 0.08-0.22 mm² | 21 01 100 9014 | |
| *har*-speed M12 contacts<br>AWG 26-23 / 0.13-0.25 mm² | 21 01 100 9019 | |
| Accessories M12 | | |
| Lock nut | 21 01 000 0018 | |
| M12<br>dynamometric screwdriver<br>Tightening torque 0.6 Nm | | |
| for M12 Slim design SW 15 | 09 99 000 0646 | |

*har*-speed contacts

| Part number | AWG | Tool settings |
|---|---|---|
| 21 01 100 9014 | 28 | 3 |
| | 26 | 4 |
| | 24 | 5 |
| 21 01 100 9019 | 26 | 4 |
| | 24 | 5 |
| | 23 | 5 |



Further information and data sheets see www.HARTING.com

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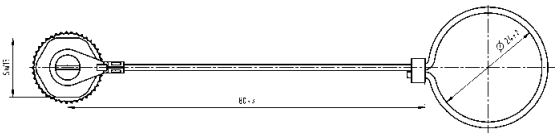
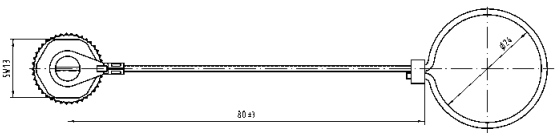
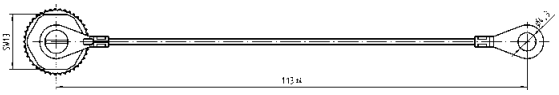
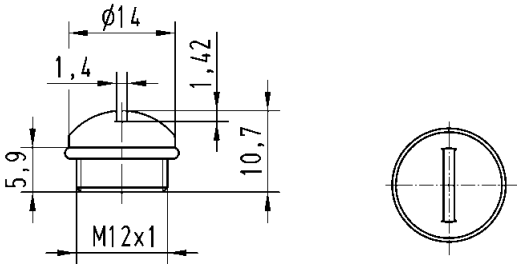
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cap metal M12**<br>for IP65 / 67<br>M12 metal cap for male side<br>with cord<br> | 21 01 000 0033 |  | |
| **Cap metal M12**<br>for IP65 / 67<br>M12 metal cap for male side<br>with cable clip<br> | 21 01 000 0038 | | |
| **Cap metal M12**<br>for IP65 / 67<br>M12 metal cap for female side<br>with cord<br> | 21 01 000 0030 |  | |
| **Cap metal M12**<br>for IP65 / 67<br>M12 metal cap for female side<br>with cable clip<br> | 21 01 000 0031 |  | |
| **Cap M12**<br>for IP65 / 67<br>Seals material Viton<br>Plastic cap for female<br> | 21 01 000 0003 |  | |





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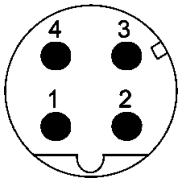
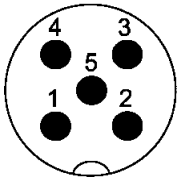
# M12 PushPull Connector

Mating face




D-coding
Mating face
acc. to IEC 61 076-2-101

Mating face

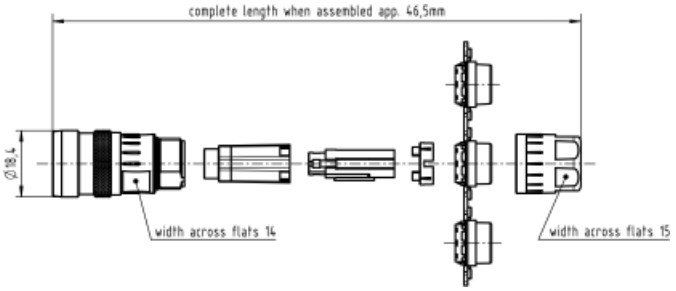



A-coding
Mating face
acc. to IEC 61 076-2-101

RoHS

## Applications / Advantages

- M12 PushPull for a fast and vibration-free connection
- Simple assembly without tools
- You can hear it click into place
- Suitable for signal and data transmission

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 PushPull Slim design<br> <br>Male<br>straight version<br>4 poles, D-coding, IP54<br>Cable diameter: 5.7 - 8.8 mm | 21 03 881 1430 |  | |
| M12 PushPull Slim design<br> <br>Male<br>straight version<br>5 poles, A-coding, IP54<br>Cable diameter: 5.7 - 8.8 mm | 21 03 821 1530 | | |



Further information and data sheets see www.HARTING.com

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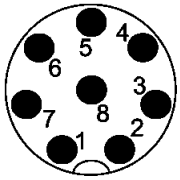
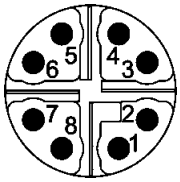
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

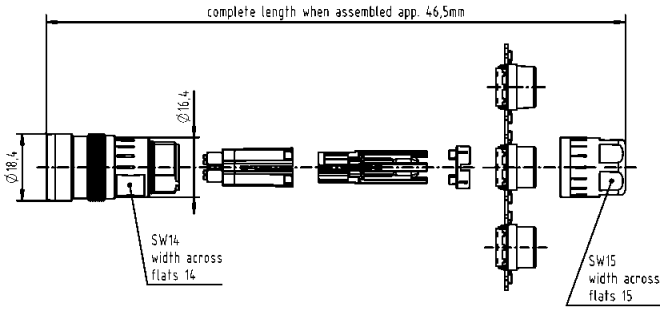
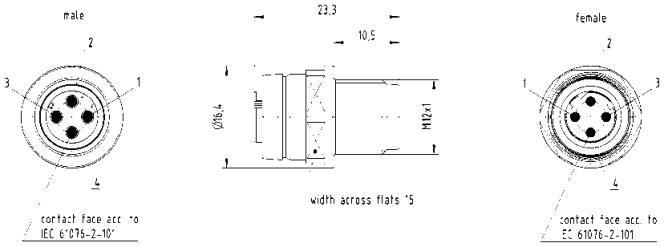
Mating face




X-coding
Mating face
acc. to IEC 61076-2-119

RoHS



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 PushPull Slim design<br> <br>Male<br>straight version<br>8 poles, A-coding, IP54<br>Cable diameter: 5.7 - 8.8 mm | 21 03 821 1830 |  | |
| M12 PushPull Slim design<br> <br>Male<br>straight version<br>8 poles, X-coding, IP54<br>Cable diameter: 5.7 - 8.8 mm | 21 03 881 1830 | | |
| M12 PushPull adapter | 21 03 381 2403 |  | |

The adapter can be used to bring a PushPull feature on a standard receptacle housing without PushPull feature.



Further information and data sheets see www.HARTING.com

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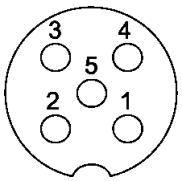
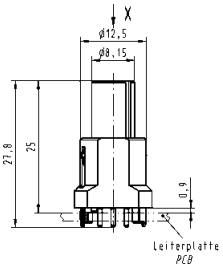
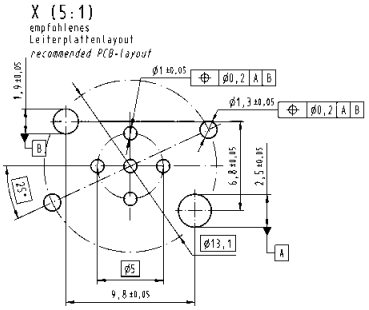
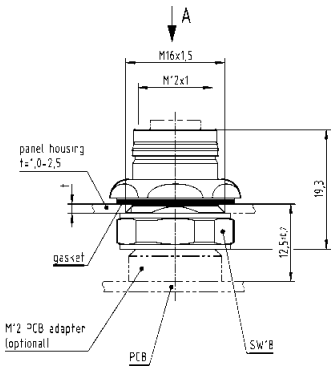
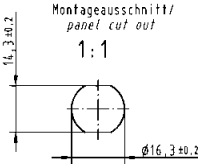
# M12 PushPull PCB connector

Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **M12 PCB adapter, shielded**<br> <br>**Packaging: 60 pieces in a tray**<br>**Order housing separately** | |  <br>  | |
| Female<br>5 poles, A-coding | 21 03 321 2518* | | |
| 8 poles, A-coding | 21 03 321 2818* | | |
| **Housing for PushPull locking**<br> | |  <br>  | |
| for front mounting | 21 03 301 2003 | | |



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* UL approval is in preparation

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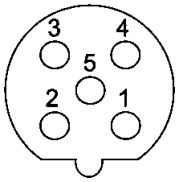
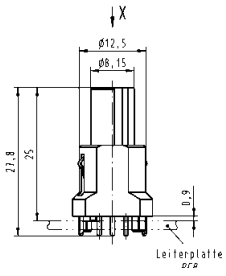
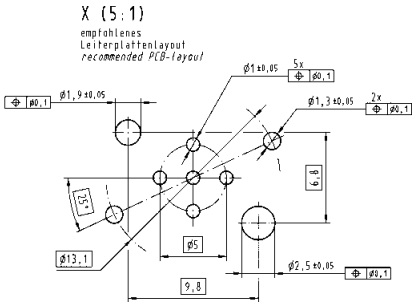
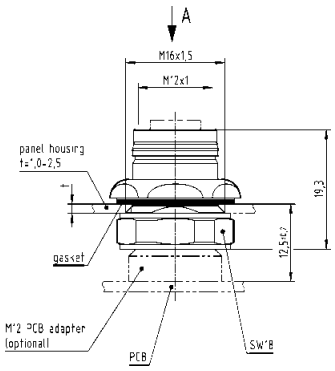
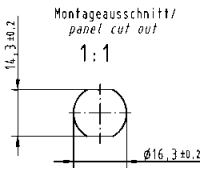
# M12 PushPull PCB connector

Mating face




B-coding
Mating face
acc. to IEC 61 076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 PCB adapter, shielded<br> <br>**Packaging: 60 pieces in a tray**<br>**Order housing separately**<br>Female<br>5 poles, B-coding | 21 03 341 2518* |  <br>  | |
| Housing for PushPull locking<br> <br>for front mounting | 21 03 301 2003 |  <br>  | |



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* UL approval is in preparation

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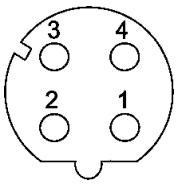
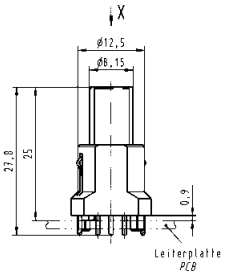
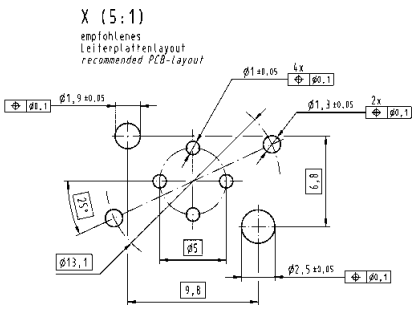
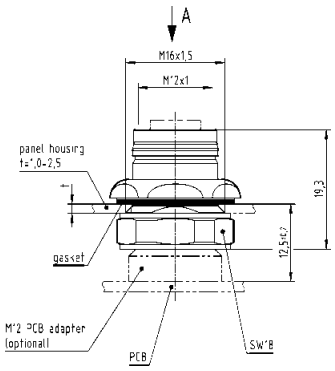
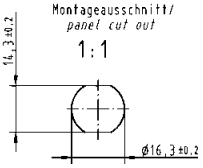
# M12 PushPull PCB connector

Mating face




D-coding
Mating face
acc. to IEC 61076-2-101

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 PCB adapter, shielded<br> <br>**Packaging: 60 pieces in a tray**<br>**Order housing separately**<br><br>Female<br>4 poles, D-coding | 21 03 381 2418* |  <br>  | |
| Housing for PushPull locking<br> <br><br>for front mounting | 21 03 301 2003 |  <br>  | |



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* UL approval is in preparation

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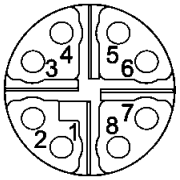
# M12 PushPull PCB connector

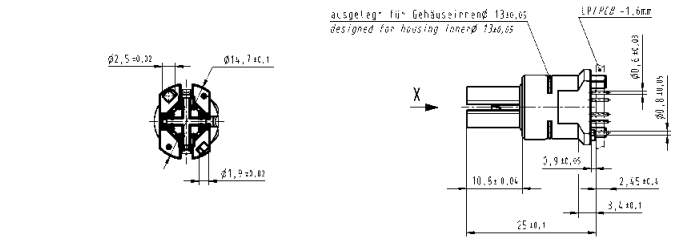
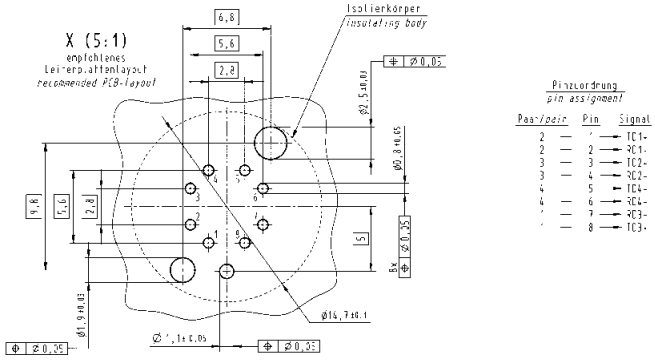
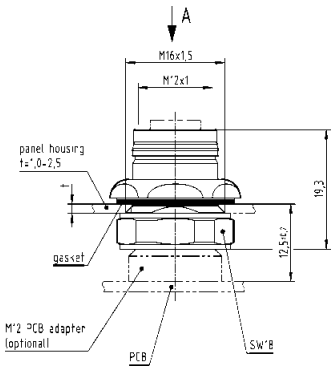
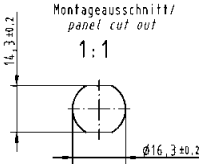
Mating face




X-coding
Mating face
acc. to IEC 61 076-2-101

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *har*-speed M12 PCB adapter<br> <br>**Packaging: 60 pieces in a tray**<br>**Order housing separately**<br><br>Female<br>8 poles, X-coding<br>Cat. $6_A$ | 21 03 381 2806 |  <br>  | |
| Female<br>8 poles, X-coding<br>Cat. 5 | 21 03 381 2807 | | |
| Housing<br>for PushPull locking<br> | |  <br>  | |
| for front mounting | 21 03 301 2003 | | |



Further information and data sheets see www.HARTING.com

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| Identification | Part number | Drawing |
|---|---|---|
| **Crimping tool**<br>for M12 PushPull | 09 99 000 0501 | |

## Accessories M12 PushPull

### Locator

| | |
|---|---|
| for D-Sub contacts | 09 99 000 0531 |
| for contact 21 01 100 9020 | 61 03 600 0023 |
| for *har*-speed contacts | 09 99 000 0525 |

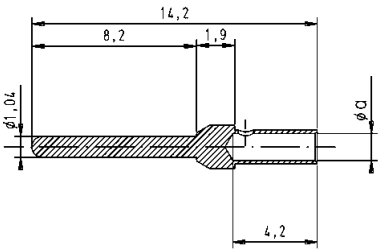
D-Sub contacts

| Part number | AWG | Tool settings |
|---|---|---|
| 09 67 000 3x76 | 18 | 6 |
| | 20 | 6 |
| | 22 | 5 |
| 09 67 000 8x76 | 20, 22, 24 | 6 |
| 09 67 000 5x76 | 22, 24, 26 | 6 |

*har*-speed contacts

| Part number | AWG | Tool settings |
|---|---|---|
| 21 01 100 9014 | 28 | 3 |
| | 26 | 4 |
| | 24 | 5 |
| 21 01 100 9019 | 26 | 4 |
| | 24 | 5 |
| | 23 | 5 |

### D-Sub single contacts (500 mating cycles)




| | a |
|---|---|
| AWG 22 - 18 | 1.34 |
| AWG 24 - 20 | 1.13 |
| AWG 26 - 22 | 0.88 |

| | |
|---|---|
| turned male contacts | |
| AWG 22 - 18 / 0.33 - 0.82 mm² | 09 67 000 3576 |
| AWG 24 - 20 / 0.25 - 0.52 mm² | 09 67 000 8576 |
| AWG 26 - 22 / 0.13 - 0.33 mm² | 09 67 000 5576 |
| AWG 28 - 24 / 0.09 - 0.25 mm² | 09 67 000 7576 |

| | |
|---|---|
| turned male contact for 8 pole connector, A-coding, AWG 26 - 22 | 21 01 100 9020 |

### Single contacts (500 mating cycles)

| | |
|---|---|
| *har*-speed M12 contacts AWG 28-24 / 0.08-0.22 mm² | 21 01 100 9014 |

| | |
|---|---|
| *har*-speed M12 contacts AWG 26-23 / 0.13-0.25 mm² | 21 01 100 9019 |





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| Identification | Part number | Drawing |
|---|---|---|
| M12<br>dynamometric screwdriver<br>Tightening torque 0.6 Nm<br>for M12 Slim design SW 15 | 09 99 000 0646 | |





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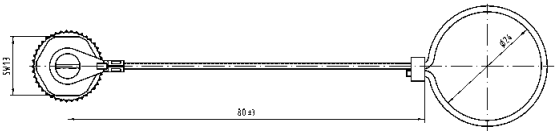
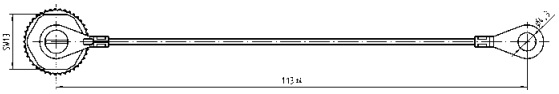
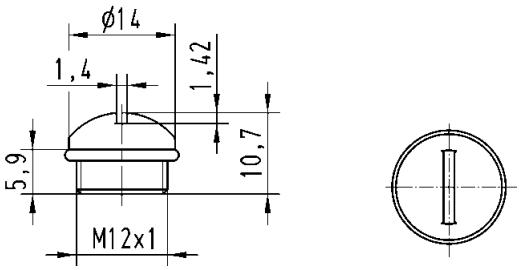
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cap metal M12**<br>for IP65 / IP67<br>M12 metal cap for female side<br>with cord<br> | 21 01 000 0030 |  | |
| **Cap metal M12**<br>for IP65 / IP67<br>M12 metal cap for female side<br>with cable clip<br> | 21 01 000 0031 |  | |
| **Cap M12**<br>for IP65 / IP67<br>Seals material Viton<br>Plastic cap for female<br> | 21 01 000 0003 |  | |





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# Notes





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**Specifications** IEC 60 352-4
IEC 60 068-2-52:1996, severity level 4

RoHS

## Technical characteristics M12 INOX

| **Type M12 INOX V4A** | ***HARAX*® M12-L**<br>**4 poles** | **M12 Crimp** |
|---|---|---|

**General data**

| | | |
|---|---|---|
| Conductor cross section | 0.34 - 0.75 mm²<br>AWG 22 - 18 | 0.14 - 0.75 mm²<br>AWG 26 - 18 |
| Diameter of individual strands | ≥ 0.1 mm | X |
| Conductor insulation material | PVC | X |
| Conductor diameter | 1.6 - 2.0 mm<br>2.0 - 2.6 mm | 2.0 - 2.3 mm |
| Cable diameter | 6 - 8 mm | 4.5 - 8.8 mm |
| Temperature range | -40 °C … +85 °C | -40 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C | -5 °C … +50 °C |
| Degree of protection | IP65 / 67 | IP65 / IP66 / IP67 |
| Mating cycles | 100 | 500 |
| Tightening torque connector / hexagonal wrench | 0.6 Nm / SW 17 | 0.6 Nm / SW 17 |

**Electrical characteristics**

| | | |
|---|---|---|
| Rated current | 6 A | 4 A |
| Rated voltage | 50 V | 250 V |
| Rated impulse voltage | 1.5 kV | 1.5 kV |
| Contact resistance | 10 mΩ | 10 mΩ |
| Insulation resistance | $10^8$ Ω | $10^8$ Ω |
| Pollution degree | 3 | 3 |
| Overvoltage category | 3 | 3 |
| Isolation group | 1 | 1 |

**Materials**

| | | |
|---|---|---|
| Contact material | Brass | Brass |
| Contact plating | Gold | Gold |
| Contact carrier material | PA unreinforced | PA |
| Housing material | V4A | V4A |





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# Technical characteristics M12 INOX



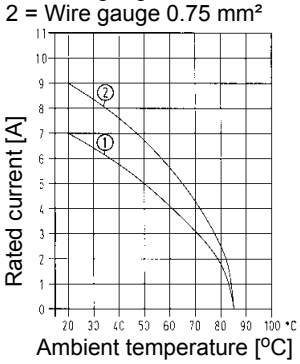
## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interruptet current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512-5.

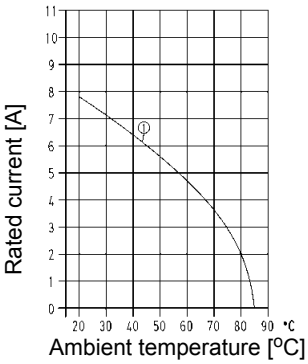
M12-L
4 poles

1 = Wire gauge 0.34 mm²
2 = Wire gauge 0.75 mm²




M12, Crimp

1 = Wire gauge 0.34 mm² / 0.5 mm²





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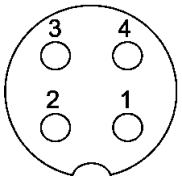
Mating face

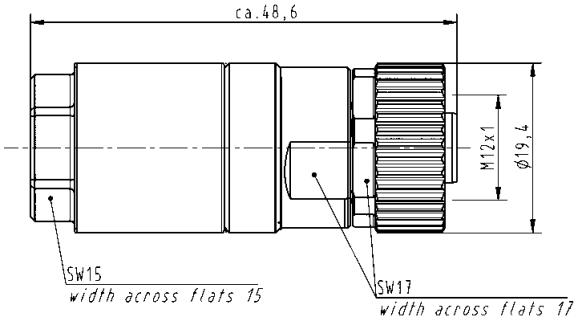



A-coding
Mating face
acc. to IEC 61076-2-101

RoHS

## Applications / Advantages

- Designed for rough outdoor applications in harsh environments
- Material V4A
- Available with crimp resp. *HARAX*® rapid termination
- Extreme robust design, quick assembly

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® M12-L INOX Female, A-coding, straight version 4 poles | 21 03 222 2435 |   | |





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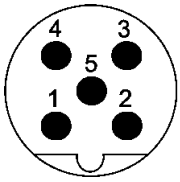
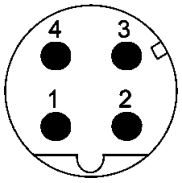
Mating face



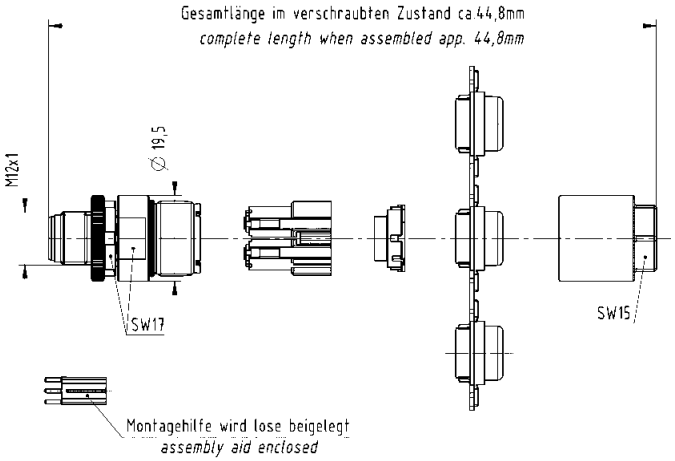
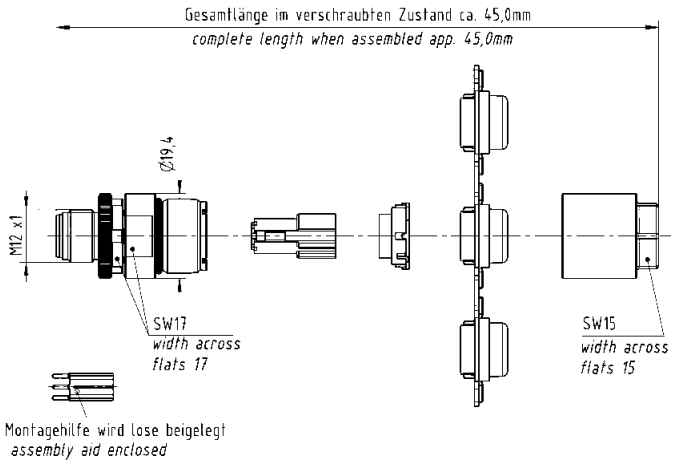

B-coding




D-coding

Mating faces acc. to IEC 61076-2-101

RoHS

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12-L Crimp INOX | | | |
| Male, B-coding, straight version 5 poles | 21 03 841 1535 |   | |
| Male, D-coding, straight version 4 poles | 21 03 882 1435 |   | |





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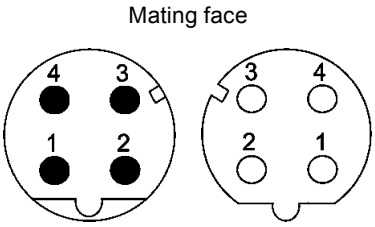
# M12 with conduit

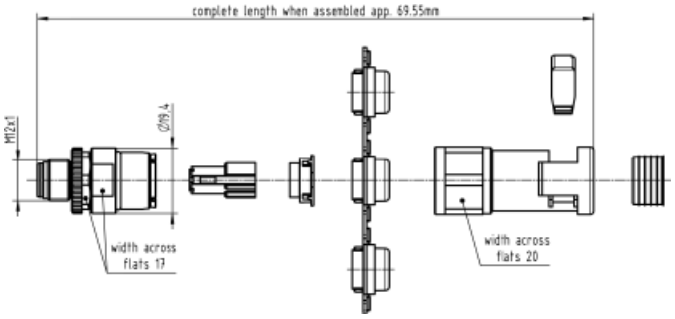
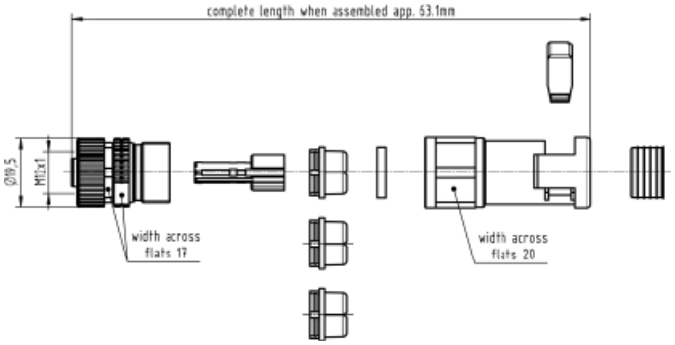



D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

## Applications / Advantages

- M12 connector with the option to connect a plastic tube to protect the cable assembly in rough applications
- Robust design for IP65 / IP67 environments
- A- and D-coding available with crimp termination
- 360° shielding

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 connector<br>with PMA connection<br>for PVC tube NW10<br> <br>Male<br>4 poles, D-coding | 21 03 882 1411 |  | |
| M12 connector<br>with PMA connection<br>for PVC tube NW10<br> <br>Female<br>4 poles, D-coding | 21 03 882 2411 |  | |

We recommend to use the PMA tube PCST-10B.50 that is available at the PMA company.



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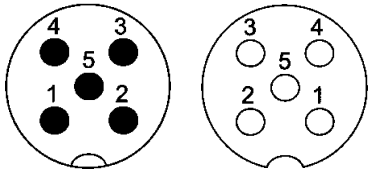
# M12 with conduit

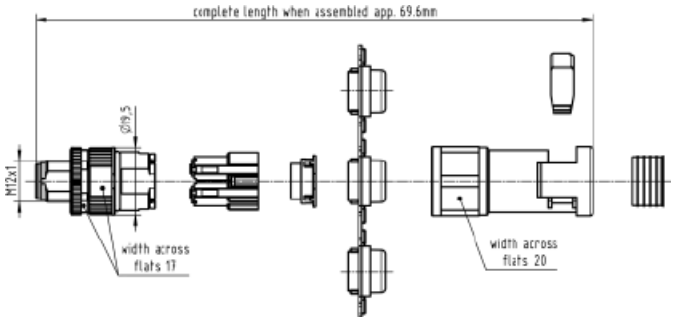
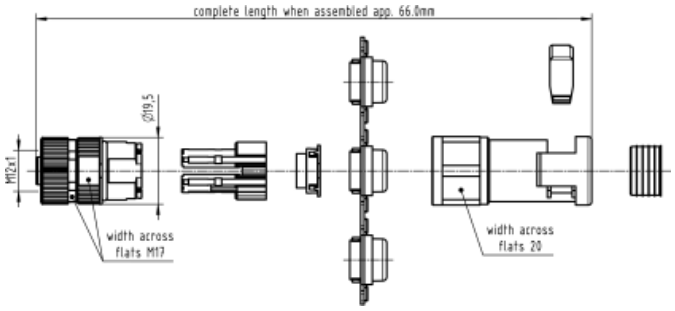
Mating face




A-coding
Mating face
acc. to IEC 61076-2-101

RoHS

Circular Connectors

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| M12 connector<br>with PMA connection<br>for PVC tube NW10<br> <br>Male<br>5 poles, A-coding | 21 03 812 1511 |  | |
| M12 connector<br>with PMA connection<br>for PVC tube NW10<br> <br>Female<br>5 poles, A-coding | 21 03 812 2511 |  | |

We recommend to use the PMA tube PCST-10B.50 that is available at the PMA company.



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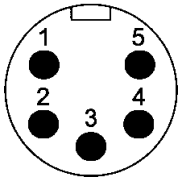
**Specifications** IEC 60 352-4
DIN 61 984

**Approval** , VDE

Mating face






## Technical characteristics 7/8“ *HARAX*®

| Type | 7/8“ *HARAX*® |
|---|---|

**General data**

| | |
|---|---|
| Conductor cross section | 0.75 - 1.5 mm²<br>AWG 18-16 |
| Diameter of individual strands | ≥ 0.15 mm |
| Conductor insulation material | PVC, PP, TPE |
| Conductor diameter | ≤ 2.8 mm |
| Cable diameter | 6.8 - 9.5 mm (black)<br>9 - 12.5 mm (grey) |
| Temperature range | -40 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C |
| Degree of protection | IP65 / IP67 |
| Mating cycles | 100 |
| Recommended tightening torque / Hexagonal wrench | 1.5 Nm / SW 22 |

**Electrical characteristics**

| | |
|---|---|
| Rated current | 10 A |
| Rated voltage | 230 V / 400 V |
| Rated impulse voltage | 4.8 kV |
| Contact resistance | 10 mΩ |
| Insulation resistance | $10^8$ Ω |
| Pollution degree | 3 |
| Overvoltage category | 3 |
| Isolation group | 1 |

**Materials**

| | |
|---|---|
| Contact material | Copper alloy |
| Contact plating | Gold |
| Contact carrier material | TPU, PA |
| Housing material | TPU, zinc die-cast, PA |





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# Technical characteristics 7/8“ *HARAX*®



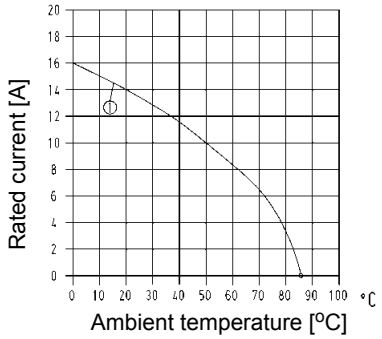
## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interruptet current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512-5.

7/8“

1 = Wire gauge 0.75 mm² / 1.5 mm²





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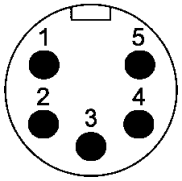
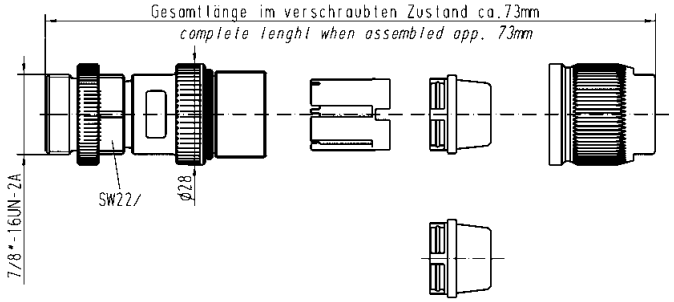
Mating face




## Applications / Advantages

- The reliable connector for power applications
- Patent *HARAX*® fast termination
- Overmoulded system cables in various lengths
- Robust design, quick assembly

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| 7/8“ *HARAX*® Male | 21 04 116 1505 |   | |



Further information and data sheets see www.HARTING.com

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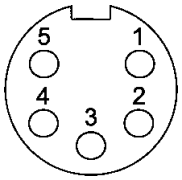
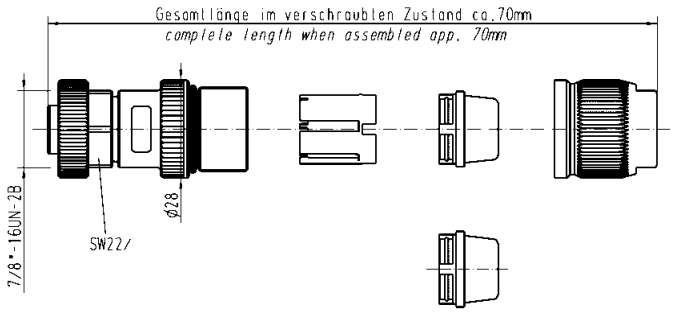
Mating face






| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| 7/8“ *HARAX*® Female | 21 04 116 2505 |   | |



Further information and data sheets see www.HARTING.com

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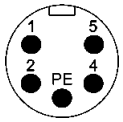
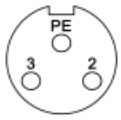
Male, 2 + PE

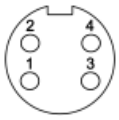
Male, 4 poles



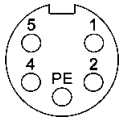
Male, 4 + PE



Female, 2 + PE



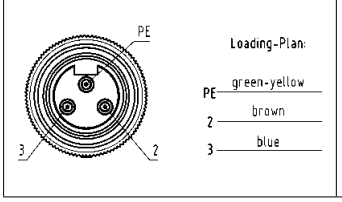
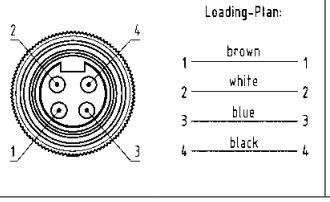
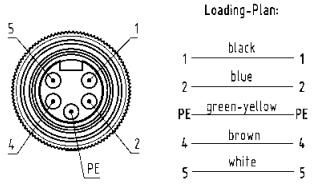
Female, 4 poles



Female, 4 + PE

## Technical characteristics

7/8“ system cables

| | 3 poles (2+PE) | | 4 poles | | 5 poles (4+PE) | |
|---|---|---|---|---|---|---|
| | PVC | PUR | PVC | PUR | PVC | PUR |
| Rated voltage | max. 300 V AC/DC | max. 300 V AC/DC | max. 300 V AC/DC | max. 300 V AC/DC | max. 300 V AC/DC | max. 300 V AC/DC |
| Rated currrent / contact | max. 10 A at +40 °C | max. 10 A at +40 °C | max. 10 A at +40 °C | max. 10 A at +40 °C | max. 10 A at +40 °C | max. 10 A at +40 °C |
| Screw locking | 7/8", self securing | 7/8", self securing | 7/8", self securing | 7/8", self securing | 7/8", self securing | 7/8", self securing |
| Temperature range (working and storage) | -30 °C … +80 °C | -30 °C … +80 °C | -30 °C … +80 °C | -30 °C … +80 °C | -30 °C … +80 °C | -30 °C … +80 °C |
| Degree of protection | IP67 | IP67 | IP67 | IP67 | IP67 | IP67 |
| Number of wires / wire gauge | 3 x 1.5 mm² | 3 x 1.5 mm² | 4 x 1.5 mm² | 4 x 1.5 mm² | 5 x 1.5 mm² | 5 x 1.5 mm² |
| Conductor insulation | PVC (bn, bu, gn/ye) | PP (bn, bu, gn/ye) | PVC (bn, wh, bu, bk) | PP (bn, wh, bu, bk) | PVC (bu, bk, wh, bn, gn/ye) | PP (bu, bk, wh, bn, gn/ye) |
| Arrangement of insulated strands | 84 x Ø 0.15 mm | 84 x Ø 0.15 mm | 84 x Ø 0.15 mm | 84 x Ø 0.15 mm | 84 x Ø 0.15 mm | 84 x Ø 0.15 mm |
| Sheath | PVC | PUR (UL, CSA) | PVC | PUR (UL, CSA) | PVC | PUR (UL, CSA) |
| Sheath colour | grey | black | grey | black | grey | black |
| Outer diameter | Ø 7.0 ± 0.2 mm | Ø 7.0 ± 0.2 mm | Ø 7.8 ± 0.2 mm | Ø 7.1 ± 0.2 mm | Ø 8.5 ± 0.2 mm | Ø 7.8 ± 0.2 mm |
| Useable as trailing cable | no | yes | no | yes | no | yes |
| Halogen free acc. to | – | DIN VDE 0472 part 815 | – | DIN VDE 0472 part 815 | – | DIN VDE 0472 part 815 |
| Flame retardant acc. to | DIN EN 60332-1-2 | DIN EN 60332-1-2 | DIN EN 60332-1-2 | cUL20549 | DIN EN 60332-1-2 | cUL20549 |
| Oil-resistant | IEC 60811-2-1 | DIN EN 60811-2-1 | – | – | – | – |
| |   | |   | |   | |



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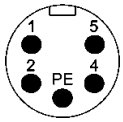
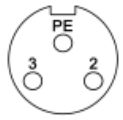
# 7/8" System cables

Male, 2 + PE

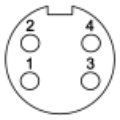
Male, 4 poles



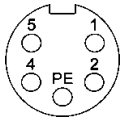
Male, 4 + PE



Female, 2 + PE



Female, 4 poles



Female, 4 + PE

## Part number definition

| 2 | 1 | 3 | 4 | X | X | X | X | X | X | X | X | X | X | X |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Connector 1**
96 Male straight
97 Female straight
98 Male angled
99 Female angled

**Connector 2**
00 No connector
96 Male straight
97 Female straight
98 Male angled
99 Female angled

**Number of contacts**
3 2 + PE
4 4 poles
5 4 + PE

**Cable material**
93 PVC (2 + PE)
94 PUR (2 + PE)
95 PVC (4 poles)
96 PUR (4 poles)
97 PVC (4 + PE)
98 PUR (4 + PE)

**Preferred length***
005 0.5 m
010 1.0 m
015 1.5 m
020 2.0 m
050 5.0 m
075 7.5 m
100 10.0 m

* Other length on request



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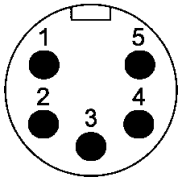
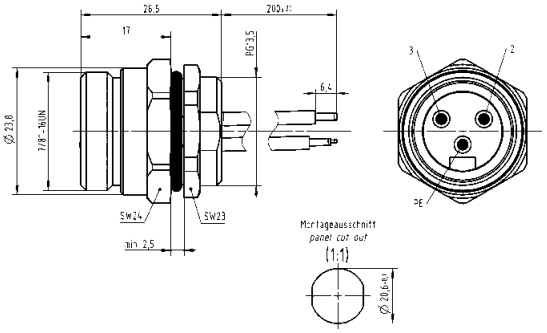
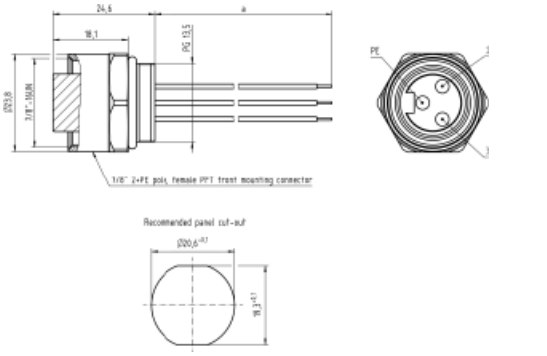
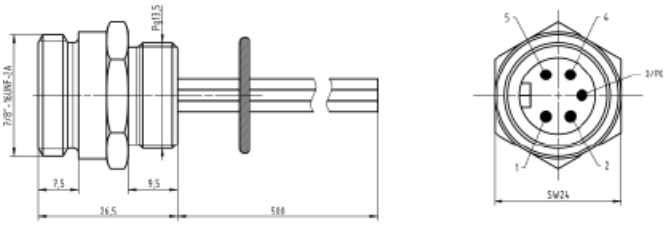
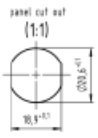
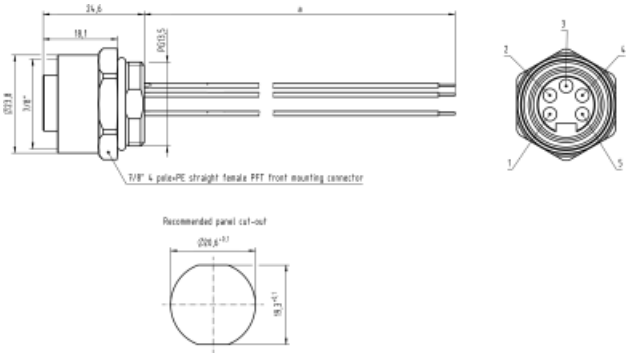
# 7/8“ Panel feed-through

Mating face




| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **7/8“ Panel feed-through**<br>20 cm conductors, AWG 18, 1 mm², 3 poles | | | |
| Male | 21 04 316 1305 |  | |
| Female | 21 04 316 2301 |  | |
| **7/8“ Panel feed-through**<br>50 cm conductors, AWG 18, 1 mm², 4 poles | | | |
| Female | 21 04 316 2401 |  | |
| **7/8“ Panel feed-through**<br>50 cm conductors, AWG 18, 1 mm², 5 poles | | | |
| Male | 21 04 316 1505 |  | |
| Female | 21 04 316 2501 |  | |



Further information and data sheets see www.HARTING.com

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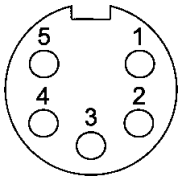
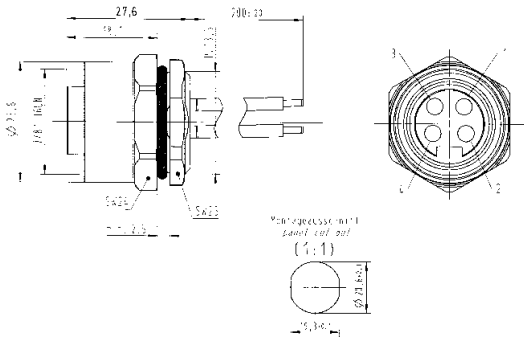
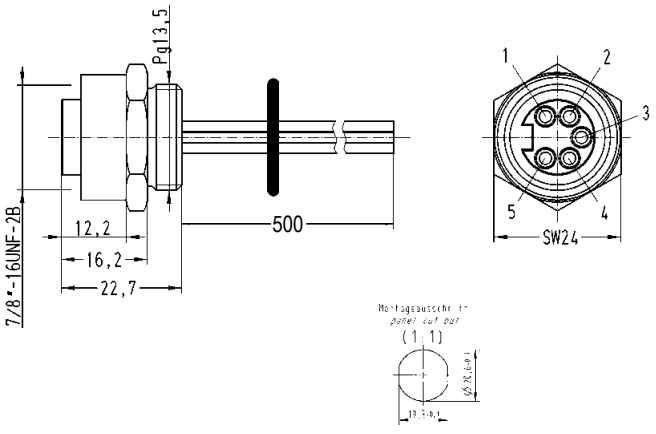
# 7/8“ Panel feed-through

Mating face






| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| 7/8“ Panel feed-through<br>20 cm conductors, AWG 18, 1 mm², 4 poles<br>Female | 21 04 316 2400 |  | |
| 7/8“ Panel feed-through<br>50 cm conductors, AWG 18, 1 mm², 5 poles<br>Female | 21 04 316 2505 |  | |

Further information and data sheets see www.HARTING.com

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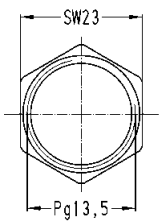
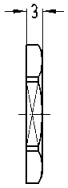
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Lock nut Pg 13.5<br>nickel plated | 21 01 000 0020 |   | |
| 7/8“<br>dynamometric screwdriver<br>Tightening torque 1.5 Nm<br>for 7/8“ SW 23 | 09 99 000 0395 | | |



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# Notes





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# *HARAX*® Panel feed-through

**Specifications** IEC 60 352-4
DIN 61 984

**Approval** , VDE

## Technical characteristics Panel feed-through

| **Type** | ***HARAX*® Pg 13.5/M20 Panel feed-through** |
|---|---|

**General data**

| | |
|---|---|
| Conductor cross section | 0.75 - 1.5 mm²<br>AWG 18 - 16 |
| Diameter of individual strands | ≥ 0.2 mm |
| Conductor insulation material | PVC, PP, TPE |
| Conductor diameter | ≤ 2.8 mm |
| Cable diameter | 6 - 9 mm |
| Temperature range | -25 °C … +85 °C |
| Temperature during connection | -5 °C … +50 °C |
| Degree of protection | IP67 |
| Mating cycles | 100 |
| Recommended tightening torque | 8 Nm |

**Electrical characteristics**

| | |
|---|---|
| Rated current | 16 A |
| Rated voltage | 230 V / 400 V |
| Rated impulse voltage | 4 KV |
| Contact resistance | 10 mΩ |
| Insulation resistance | $10^8$ Ω |
| Pollution degree | 3 |
| Overvoltage category | 3 |
| Isolation group | 1 |

**Materials**

| | |
|---|---|
| Contact material | Copper alloy |
| Contact plating | Gold |
| Contact carrier material | TPU, PA |
| Housing material | TPU, PA |





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# Technical characteristics Panel feed-through

## Current carrying capacity

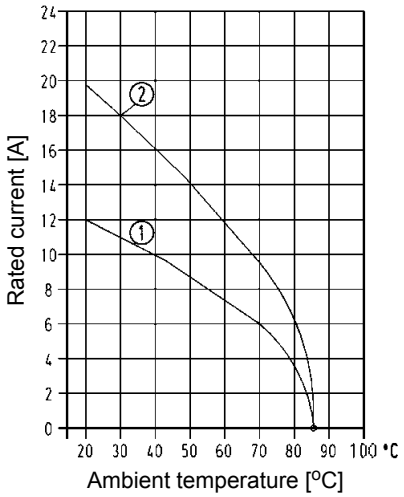
The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interruptet current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512-5.

Pg 13.5
3 poles

1 = Wire gauge
0.75 mm²

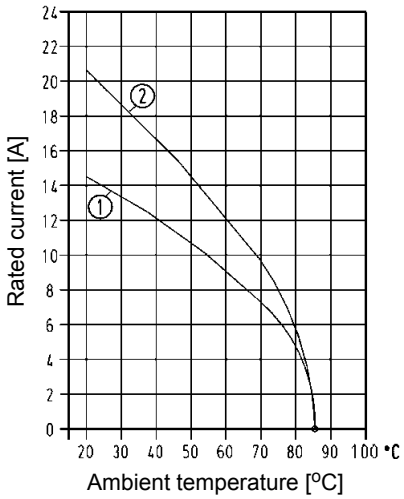
2 = Wire gauge
1.5 mm²




Pg 13.5 / M20
4 poles

1 = Wire gauge
0.75 mm²

2 = Wire gauge
1.5 mm²





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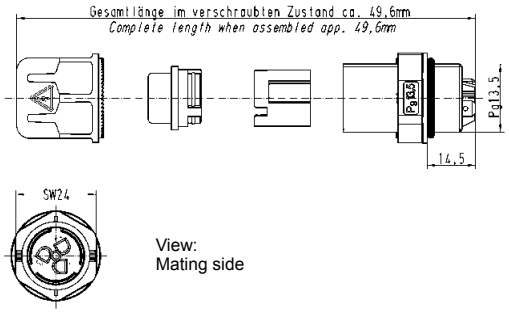
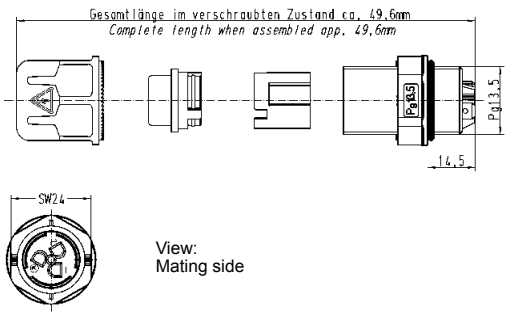
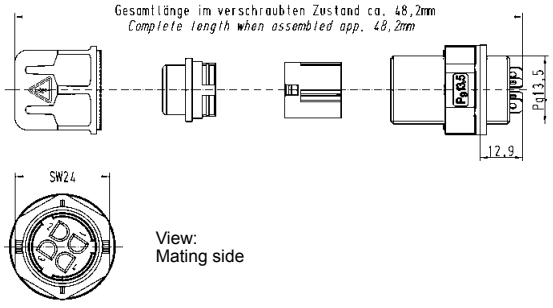
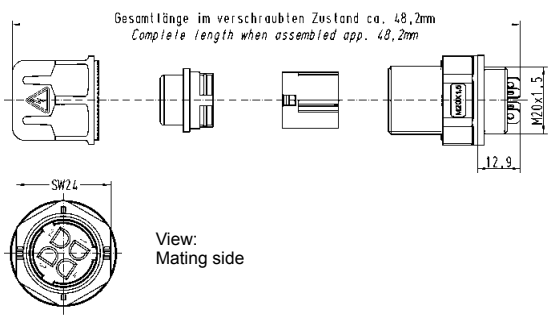
# *HARAX*® Pg 13.5 / M20 Panel feed-through

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| *HARAX*® Pg 13.5 / 3 contacts<br>with faston blades | 21 01 130 1013 |  | |
| *HARAX*® Pg 13.5 / 3 contacts<br>with solder termination | 21 01 130 1023 | | |
| *HARAX*® Pg 13.5 / 3 contacts<br>with pre-assembled pigtail cable, l = 500 mm, 1.5 mm² | 21 01 130 1223 | | |
| *HARAX*® Pg 13.5 / 2 + PE<br>with faston blades | 21 01 130 3013 |  | |
| *HARAX*® Pg 13.5 / 2 + PE<br>with solder termination | 21 01 130 3023 | | |
| *HARAX*® Pg 13.5 / 2 + PE<br>with pre-assembled pigtail cable, l = 500 mm, 1.5 mm² | 21 01 130 3233 | | |
| *HARAX*® Pg 13.5 / 4 contacts<br>with solder termination | 21 01 140 1023 |  | |
| *HARAX*® Pg 13.5 / 3 + PE<br>with solder termination | 21 01 140 3023 | | |
| *HARAX*® Pg 13.5 / 4 contacts<br>with pre-assembled pigtail cable, l = 500 mm, 1.5 mm² | 21 01 140 1323 | | |
| *HARAX*® Pg 13.5 / 3 + PE<br>with pre-assembled pigtail cable, l = 500 mm, 1.5 mm² | 21 01 140 3333 | | |
| *HARAX*® M20 / 4 contacts<br>with solder termination | 21 01 141 1023 |  | |
| *HARAX*® M20 / 3 + PE<br>with solder termination | 21 01 141 3023 | | |
| *HARAX*® M20 / 4 contacts<br>with pre-assembled pigtail cable, l = 500 mm, 1.5 mm² | 21 01 141 1323 | | |
| *HARAX*® M20 / 3 + PE<br>with pre-assembled pigtail cable, l = 500 mm, 1.5 mm² | 21 01 141 3333 | | |



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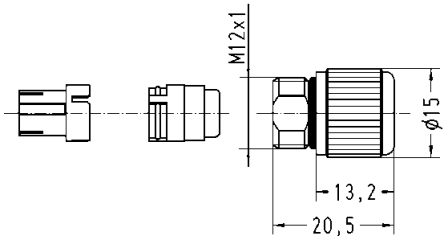
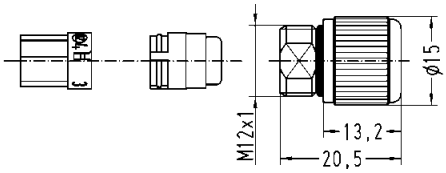
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Termination element<br>M12 *HARAX*® Pg 9<br>3 contacts<br>Screw cap, splice ring, seal | 21 01 010 0001 |  | |
| Termination element<br>M12 *HARAX*® Pg 9<br>4 contacts<br>Screw cap, splice ring, seal | 21 01 010 0006 |  | |
| Lock nut Pg 9 | 21 01 000 0008 | | |
| Lock nut Pg 13.5, SW 27 | 21 01 000 0007 | | |
| Lock nut Pg 13.5, SW 24 | 21 01 000 0039 | | |



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# Notes





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## Advantages

- IP65 / IP67 RJ45 connector with toggle locking acc. to IEC 61 076-3-106 variant 1
- Robust zinc die cast housing, nickel plated
- Vibration and shock resistant
- Min. 500 mating cycles
- Shielded and unshielded versions
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- ODVA approval



## Technical characteristics device side

| | **Han-Max®** |
|---|---|
| Connector type | RJ45 acc. to IEC 60 603-7 |
| Number of contacts | 8 |
| Transmission performance | Category 5 / class D up to 100 MHz acc. to ISO/IEC 11801:2002; EN 50173-1 |
| Transmission rate | 10/100/1.000 Mbit/s |
| Shielding | unshielded / shielded |
| Mounting | field-assembly |
| Termination | with IDC contacts |
| Connectable cables | |
| - Conductor cross section | AWG 22 ... AWG 24 solid / stranded |
| Temperature range | -25 °C … +70 °C |

## Technical characteristics cable side

| | **Han-Max®** | **Han-Max® RJ Industrial** | **Han-Max® RJ Industrial 10G** |
|---|---|---|---|
| Connector type | RJ45 acc. to IEC 60 603-7 | RJ45 acc. to IEC 60 603-7 | RJ45 acc. to IEC 60 603-7 |
| Number of contacts | 8 | 4 | 8 |
| Transmission performance | Category 5 / class D up to 100 MHz acc. to ISO/IEC 11801:2002; EN 50173-1 | Category 5 / class D up to 100 MHz acc. to ISO/IEC 11801:2002; EN 50173-1 | Category 6 / class $E_A$ up to 250 MHz acc. to ISO/IEC 11801:2002; EN 50173-1 |
| Transmission rate | 10/100/1.000 Mbit/s | 10/100 Mbit/s | 10/100 Mbit/s resp. 1/10 Gbit/s |
| Shielding | unshielded / shielded | fully shielded, 360° shielding contact | fully shielded, 360° shielding contact |
| Mounting | field-assembly | no tools needed, field-assembly | no tools needed, field-assembly |
| Termination | with piercing contacts | with IDC contacts | with IDC contacts |
| Connectable cables | | | |
| - Conductor cross section | AWG 26/7 ... AWG 24/7 stranded | AWG 24/7 ... AWG 22/7 stranded<br>AWG 23/1 ... AWG 22/1 solid | AWG 27/7 ... AWG 22/7 stranded<br>AWG 24/1 ... AWG 22/1 solid |
| - Conductor diameter | max. 1.0 mm (including insulation) | max. 1.6 mm (including insulation) | max. 1.6 mm (including insulation) |
| - Cable diameter | 4 ... 8 mm | 4 ... 8 mm | 4 ... 8 mm |
| Temperature range | -25 °C ... +70 °C | -40 °C ... +70 °C | -40 °C ... +70 °C |



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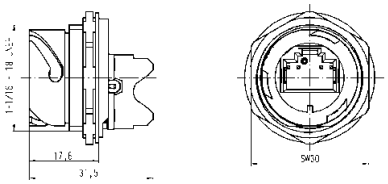
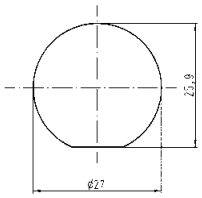
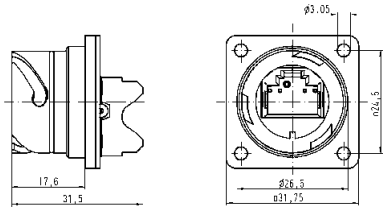
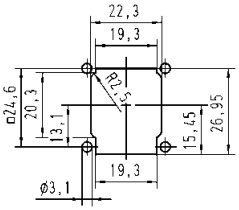
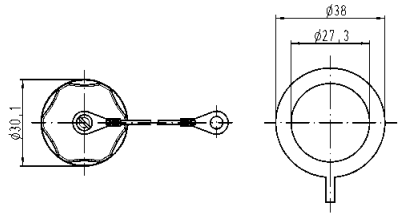
## Device side

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han-Max®<br>RJ45 panel feed-through<br><br>unshielded version (UTP)<br> | 09 15 300 0301 |  | Panel cut out for max.<br>Panel thickness 2.3 mm<br>  |
| Han-Max® MS<br>RJ45 panel feed-through<br><br>unshielded version (UTP)<br> | 09 15 300 0311 |  | panel feed through<br>  |
| Han-Max® Protection cover<br>Device side<br> | 09 15 300 5411 |  | |



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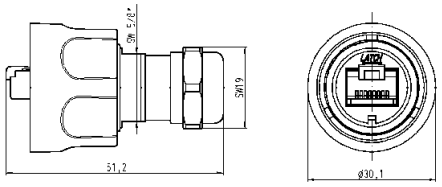
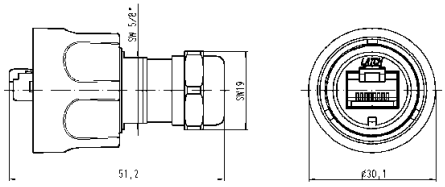
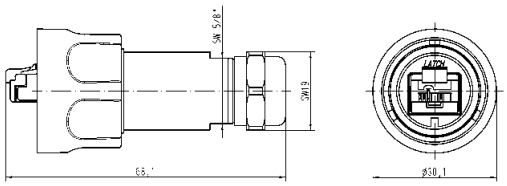
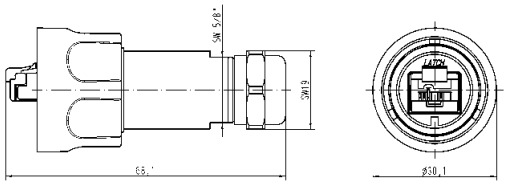
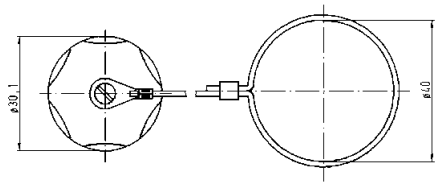
## Cable side

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Han-Max®**<br>Connector Cat. 5, 8-poles,<br>piercing termination<br><br>unshielded version (UTP)<br> | 09 15 300 0401 |  | |
| fully shielded version (STP) | 09 15 300 0402 |  | |
| **Han-Max® RJ Industrial**<br>Connector Cat. 5, 4-poles,<br>IDC termination<br> | 09 15 300 0412 |  | |
| **Han-Max® RJ Industrial 10G**<br>Connector Cat. 6, 8-poles,<br>IDC termination<br> | 09 15 300 0431 |  | |
| **Han-Max® Protection cover**<br>Cable side<br> | 09 15 300 5401 |  | |





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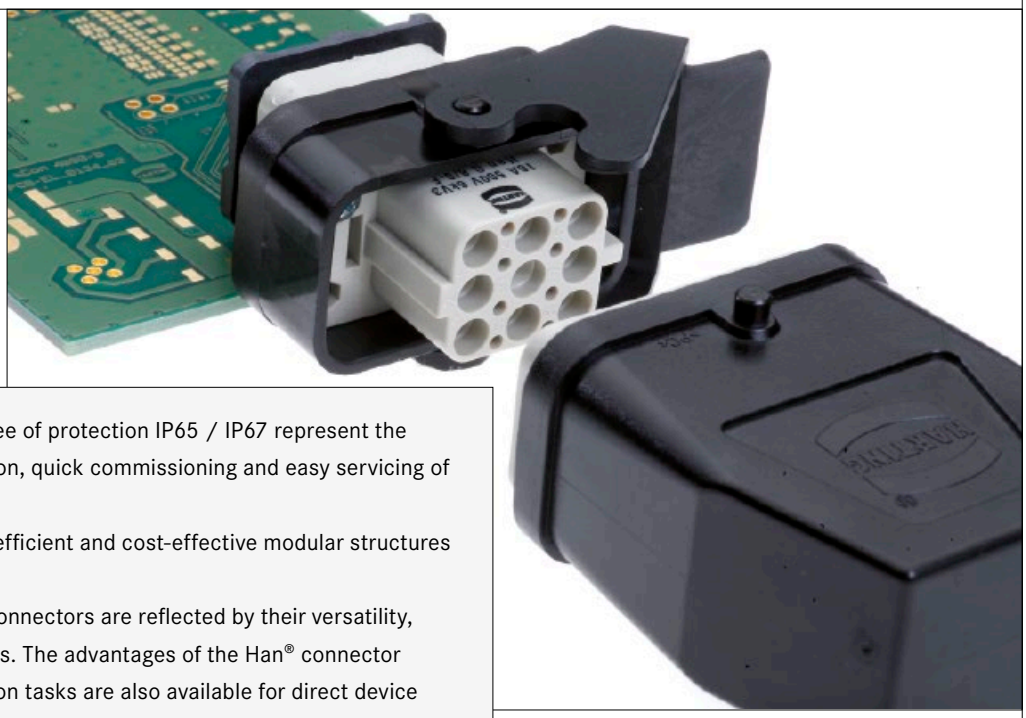
# 04. Industrial Connector Han®

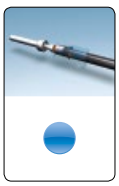
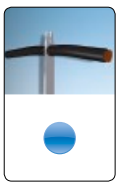
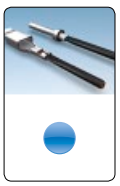
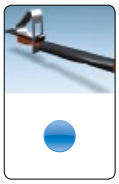
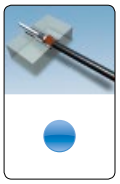


Han® industrial connectors with degree of protection IP65 / IP67 represent the worldwide standard for safe installation, quick commissioning and easy servicing of machines and plants.
The use of Han® connectors enables efficient and cost-effective modular structures of machines and plants.
The outstanding properties of Han® connectors are reflected by their versatility, application bandwidth and ruggedness. The advantages of the Han® connector family that users know from installation tasks are also available for direct device connections. The Han® connectors support the installation of automation systems in control cabinets and of IP65 / IP67 distributed devices using identical connectors.
Key user benefits: Investment and operational security.

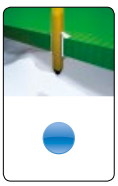
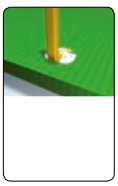
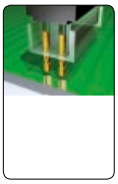
*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| | ● | | ● | ● | ● | ● | | ● | ● | ● |

**Cable termination**

| *Han-Quick Lock®* | *IDC* | *Crimp* |
|---|---|---|
|  |  |  |
| ● | ● | ● |
| *Screw* | *Cage clamp* | *Axial screw* |
| |  |  |
| ● | ● | ● |

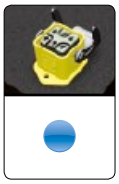
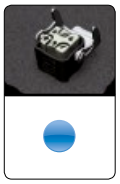
**PCB termination**

| *THT* | *SMC* | *SMT* |
|---|---|---|
|  | |  |
| ● | | |
| *Press-in* | | |
|  | | |
| | | |

**Application standard**

PROFINET PROFIBUS ECOFAST

**Housing integration**

| *separate housing* | *integrated housing* |
|---|---|
|  |  |
| ● | ● |

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# 04. Industrial Connector Han®

Han® connectors with degree of protection IP65 / IP67 are established as the worldwide standard for industrial connectors. This standard connector can also be used directly as appliance connector.
The rugged housings are equipped with secure interlock mechanisms that protect the contact inserts from external negative influences such as dust, dampness and mechanical stress. On the appliance side, the connector contacts are routed in the bulkhead mount module, soldered directly onto the PCB and are aligned precisely to the bulkhead frame. This results in appliance connections that are resistant to any environmental stress.
The Han® appliance connectors offer comprehensive solutions based on connector inserts for data, signal and power lines up to 32 A per contact. The Han® 3 A housing can be equipped for communication applications with copper-bound RJ45 modules, 4-pole (Cat. 5) and 8-pole (Cat. 6) and optical LC modules.
The power contact inserts are available for the Han® 3 A, Han® Compact and Han® B housing variants. The cables can be wired to the contact inserts by way of crimp, screw or cage clamp terminals, or using the patented Quick-Lock® quick connection technology for on-site assembly.
HARTING highlights its Han® 3 A appliance connector series with versatile hybrid contact inserts for wiring data and power lines using a single connector and cable. This functionality results in a reduction of insertion points and cabling by more than 50%.
Han® connectors with high degree of protection can be used for wiring appliances, terminal boxes and control cabinets.

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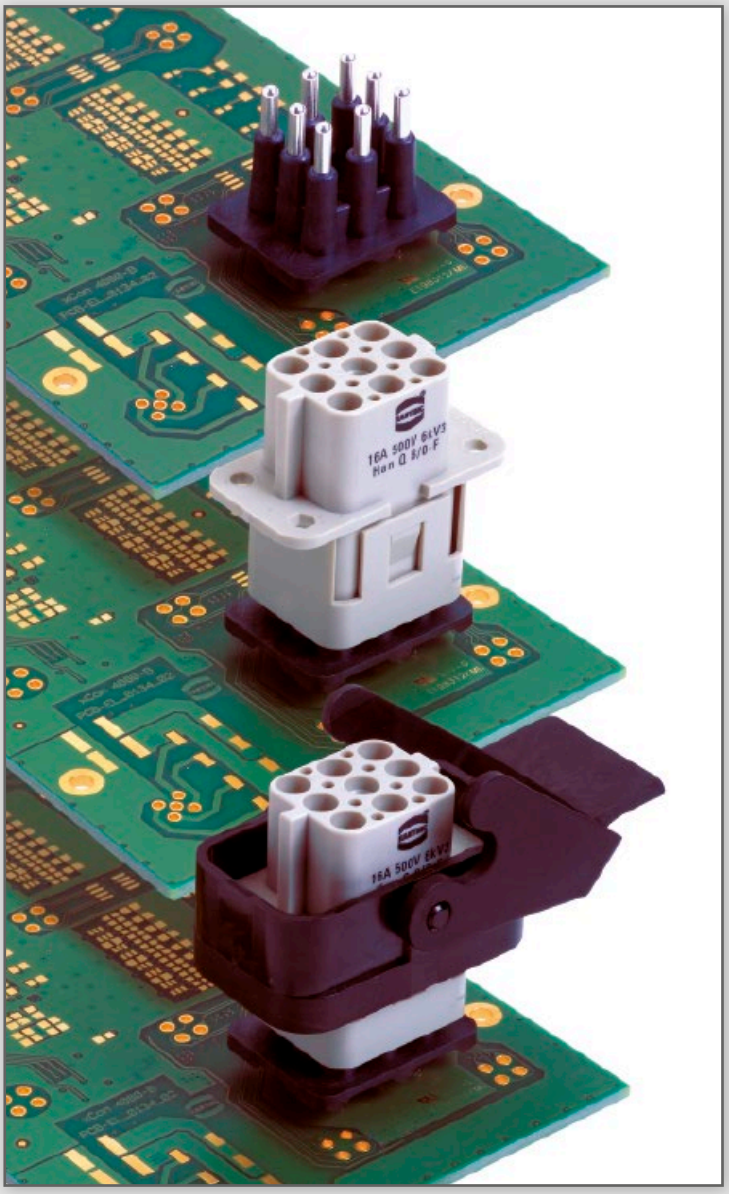
**Han® APPLIANCE CONNECTORS:**

The PCB-Adapter of HARTING can be used to convert Han® industrial connectors into fully-fledged PCB connectors.
The modular PCB adapters enable the implementation of various Han® contact inserts.

The PCB Adapter concept:

- The PCB adapter is processed as component in a standard soldering process and is a fixed part of the PCB.
- The contact insert of the Han® industrial connector is simply plugged in after the soldering process has been completed.
- The bulkhead mount housing with the bracket interlock is mounted to the appliance housing.

This modularity guarantees the availability of a wide range of contact inserts and connector housings for the assembly of a multitude of rugged IP65 / IP67 appliance connectors for data, signal and power lines.



**SCALABLE HYBRID APPLIANCE CONNECTION USING Han® CONNECTORS:**

The hybrid appliance connector series enable the cost-effective combination of Fieldbus/Ethernet communication and power supply lines in a single cable and connector.
The contact insert combination for communication and for the power supply to the appliance is soldered directly to the PCB. The bulkhead mount housing can be adapted directly to the housing shape, or be mounted as separate unit to the appliance housing.
HARTING offers cable solutions for smaller batches which can be used to connect the contact insert to the PCB.
Key user benefits: A tailored appliance connection is always available for small- and large-scale appliance series.

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# Han® 3 A RJ45

Han® 3 A RJ45 device side

Han

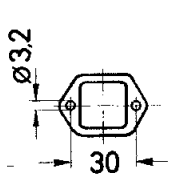
## Advantages

- Simple mounting
- RJ45 plug-compatible
- Different versions cover all applications
- Coding (4 variants) possible

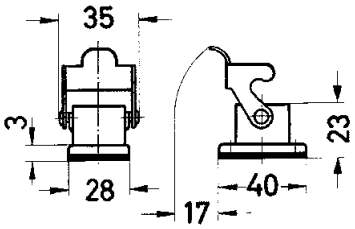
## Technical characteristics

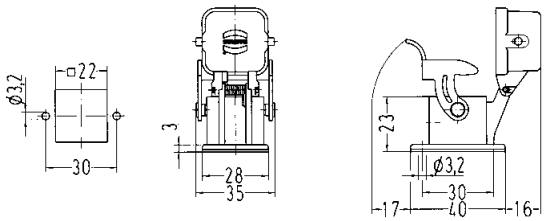
| | |
|---|---|
| Number of ports<br>Copper / termination | 2 / 1x Han® 3 A RJ45 (IP65 / IP67)<br>1x RJ45 (IP20) |
| Transmission performance | Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1 |
| Transmission rate | 10/100/1000 Mbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Mounting | screw-on type on steel plate walls |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 500 |
| Temperature range | -40 °C … +70 °C |
| Housing material<br>Plastic version<br>Metal version | <br>Polycarbonate, black, UL 94 V0<br>Zinc die-cast, powder coating, grey |

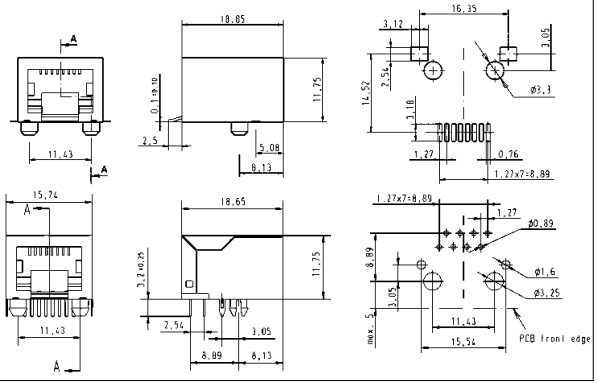
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Housing** bulkhead mounting | | | |
| Plastic version, black | 09 20 003 0327 | | |
| Metal version Standard | 09 20 003 0301 | | |
| Metal version M | 09 37 003 0301 | | |
| with fixed cover and with seal | | | |
| Metal version Standard | 09 20 003 0306 | | |
| Metal version M | 09 37 003 0306 | | |
| **Adapter** | | | |
| for fixing of RJ45 jack | | | |
| with fixing clip | 09 45 515 0020 | | |
| without fixing clip | 09 45 515 0022 | | |
| **RJ45 jacks Cat. 5** | | | |
| Solder variant SMD, 90° angled | 09 45 551 1100[1]<br>09 45 551 1110[2] | | |
| Solder variant overmolded, 90° angled | 09 45 551 1102[1] | | |




Dimensions valid for Metal version Standard




[1] Packaging: Blister à 120 pieces
[2] Packaging: Tape & Reel à 130 pieces



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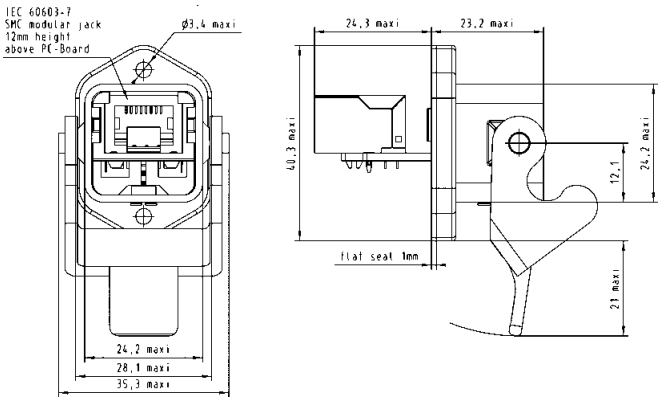
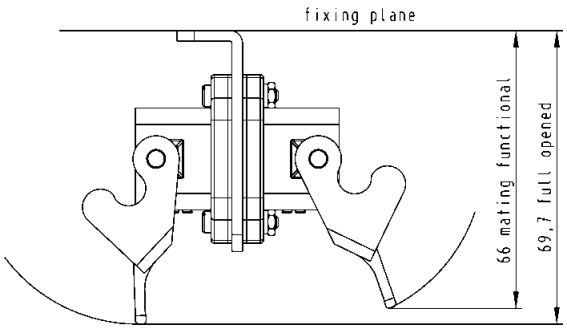
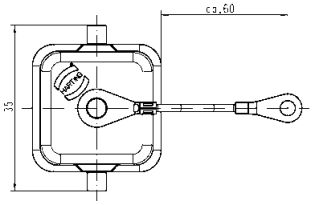
## Han® 3 A RJ45-panel feed-throughs and couplings Cat. 5



| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Panel feed-through set, 8-poles** | | | | |
| Plastic version, black | straight | 09 45 225 1100 | | |
| | angled | 09 45 225 1108 | | |
| Metal version Standard, grey | straight | 09 45 215 1100 | | |
| | straight, inner vertical jack | 09 45 215 1101 | | |
| | angled | 09 45 215 1108 | | |
| Metal version Standard, grey with self-closing protective cap | straight | 09 45 215 1103 | | |
| Metal version M, black | straight | 09 45 215 1102 | | |
| | angled | 09 45 215 1109 | | |
| Coding pin set for 4 different codings | | 09 45 820 0000 | | |
| | | |   | Dimensions valid for plastic version, straight |
| **Double coupling, 8-poles** incl. installation frame metal | | | | |
| Plastic version, black | | 09 45 225 1107 | | |
| Metal version Standard, grey | | 09 45 215 1107 | | |
| Metal version M, black | | 09 45 215 1110 | | |
| Coding pin set for 4 different codings | | 09 45 820 0000 | | |
| | | |   | Dimensions valid for plastic version |
| **Protection cover for panel feed-through** IP65 / IP67 with seal | | | | |
| Plastic version, black | | 09 20 003 5449 | | |
| Metal version Standard, grey | | 09 20 003 5425 | | |
| Metal version M, black | | 09 37 003 5405 | | |
| | | |   | Dimensions valid for plastic version |



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# Han® 3 A RJ45

Han® 3 A RJ45 10G Cat. 6 – panel feed-throughs



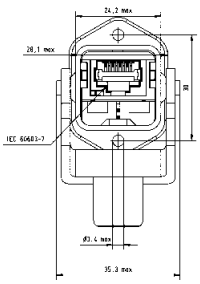
## Advantages

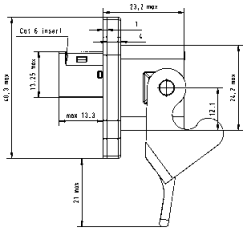
- Compact and robust design
- 360° shielding
- Easy mounting
- Transmission category 6, performance class $E_A$, suitable for 1/10 Gigabit Ethernet
- RJ45 mating compatible
- Coding (4 variants) possible

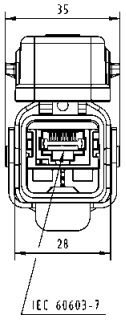
## Technical characteristics

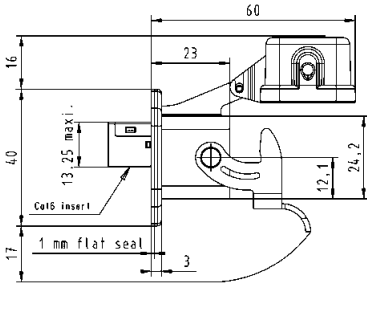
| | |
|---|---|
| Number of ports | 2 / 1x Han® 3 A RJ45 (IP65 / IP67)<br>1x RJ45 (IP20) |
| Transmission performance | Category 6 / class $E_A$ acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | Fully shielded, 360° shielding contact |
| Mounting | Screwable to cover plates |
| Degree of protection | IP65 / IP67 |
| Mating cycles | min. 500 |
| Temperature range | -40 °C ... + 70 °C |
| Housing material | |
| Plastic version | Polycarbonate, black, UL 94 V0 |
| Metal version | Zinc die-cast, powder-coated |

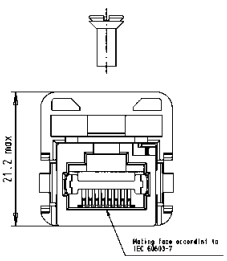
| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Panel feed-through set, 8-poles** | | | |
| Plastic version, black | 09 45 225 1560 | | |
| Metal version Standard, grey | 09 45 215 1560 | | |
| Metal version M, black | 09 45 215 1561 | | |
| Metal version Standard, grey, with self-closing protective cap | 09 45 215 1562 | | |
| **Han® 3 A RJ45 10G insert Cat. 6** (for Han® 3 A housings) | 09 45 200 1560 | | |
| **Han® 3 A RJ45 HIFF adapter** to mount HIFF inserts (e.g. HARTING RJ Industrial® 10G RJ45 bulkhead or Ha-VIS preLink® RJ45) in Han® 3 A housings | 09 45 515 0024 | | |

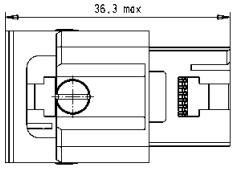


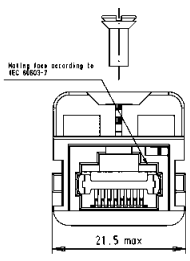




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# Han® 3 A RJ45

Han® 3 A connector RJ45, 4-poles, Cat. 5



## Advantages

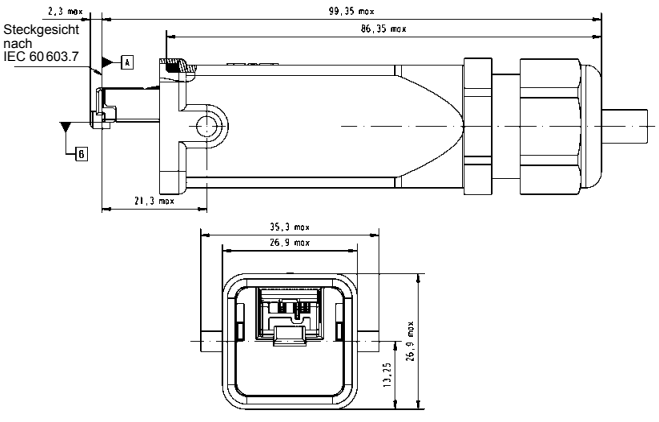
- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Category of transmission Cat. 5
- Compact design and very robust housing
- Suitable for termination of solid and stranded cables
- Up to 10 x reconductable
- PROFINET compatible
- Min. 500 mating cycles

## Technical characteristics

| | |
|---|---|
| Connector type | Han® 3 A Connector RJ45<br>acc. to IEC 61076-3-106 variant 5 |
| Number of contacts | 4 |
| Transmission performance | Category 5 / Class D up to 100 MHz<br>acc. to ISO/IEC 11801:2002,<br>EN 50173-1 |
| Transmission rate | 10/100 Mbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Cable termination | tool-less with IDC contacts |
| Conductor cross section | |
| stranded | AWG 24/7 - AWG 22/7 |
| solid | AWG 23/1 - AWG 22/1 |
| Conductor diameter | max. 1.6 mm |
| Cable outer diameter | 6.5 mm – 9.5 mm |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | |
| Plastic version | Polycarbonate, UL 94 V0, black |
| Metal versions | |
| Standard | Zinc die-cast, powder coating grey |
| M-version | Zinc die-cast, powder coating black |

| Identification | | Part number |
|---|---|---|
| Han® 3 A connector set RJ45, 4-poles<br>incl. housing, cable gland and instruction manual | | |
| Plastic version, black | straight | 09 45 125 1100 |
| | angled | 09 45 125 1104 |
| Metal version Standard, grey | straight | 09 45 115 1100 |
| | angled | 09 45 115 1104 |
| Metal version M, black | straight | 09 45 115 1102 |
| | angled | 09 45 115 1106 |
| Coding pin set | | 09 45 820 0000 |

Drawing — Dimensions in mm




Dimensions valid for plastic version, straight

Assembled system cables see catalogue “Intelligent Network Solutions”



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# Han® 3 A RJ45

Han® 3 A connector set RJ45, 8-poles, Cat. $6_A$



## Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with mounting tool
- Category of transmission Cat. $6_A$
- Compact design and very robust housing
- Min. 500 mating cycles

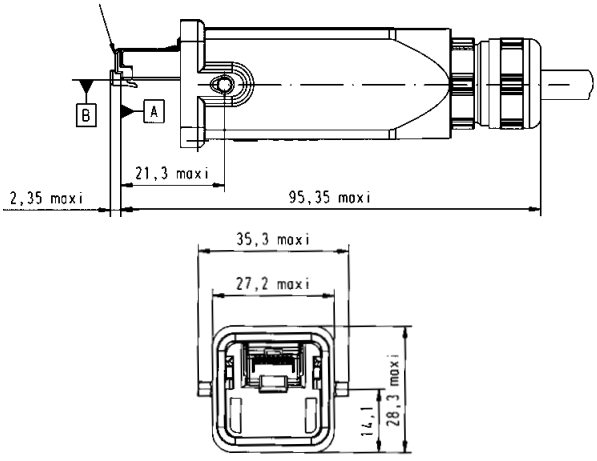
## Technical characteristics

| | |
|---|---|
| Connector type | Han® 3 A Connector RJ45 |
| Number of contacts | 8 |
| Transmission performance | Category $6_A$ / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Cable termination | with piercing contacts |
| Conductor cross section | AWG 28/7 - AWG 24/7, stranded |
| Conductor diameter | max. 1.05 mm |
| Cable outer diameter | 6.5 mm – 9.5 mm |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | |
| Plastic version | Polycarbonate, UL 94 V0, black |
| Metal versions | |
| Standard | Zinc die-cast, powder coating grey |
| M-version | Zinc die-cast, powder coating black |

| Identification | Part number |
|---|---|
| Han® 3 A connector set RJ45, 8-poles, Cat. 6 incl. housing, cable gland and instruction manual | |
| Plastic version, black | 09 45 125 1520 |
| Metal version Standard, grey | 09 45 115 1520 |
| Metal version M, black | 09 45 115 1522 |
| Han® 3 A RJ45 connector insert can be combined with Han® 3 A housing | 09 45 100 1520 |
| Coding pin set | 09 45 820 0000 |
| suitable assembly tool | 09 45 800 0520 |

Drawing — Dimensions in mm

Mating face acc. to IEC 60 603-7




Dimensions valid for metal version Standard



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# Han® 3 A RJ45

Han® 3 A RJ45 10G connector, 8-poles, Cat. 6



## Advantages

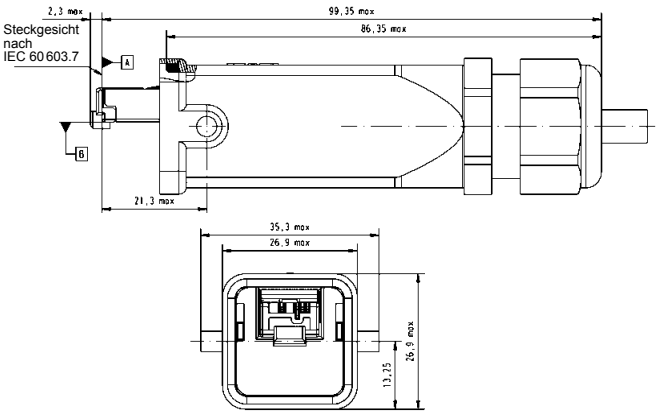
- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Category of transmission Cat. 6
- Compact design and very robust housing
- Suitable for termination of solid and stranded cables
- PROFINET compatible
- Min. 500 mating cycles

## Technical characteristics

| | |
|---|---|
| Connector type | Han® 3 A Connector RJ45<br>acc. to IEC 61076-3-106 variant 5 |
| Number of contacts | 8 |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz<br>acc. to ISO/IEC 11801:2002,<br>EN 50173-1 |
| Transmission rate | 10/100 Mbit/s and 1/10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Cable termination | tool-less with IDC contacts |
| Conductor cross section | |
| stranded | AWG 27/7 - AWG 22/7 |
| solid | AWG 24/1 - AWG 22/1 |
| Conductor diameter | max. 1.6 mm |
| Cable outer diameter | 6.5 mm – 9.5 mm |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | |
| Plastic version | Polycarbonate, UL 94 V0, black |
| Metal versions | |
| Standard | Zinc die-cast, powder coating grey |

| Identification | | Part number |
|---|---|---|
| Han® 3 A RJ45 connector, 8-poles<br>incl. housing, cable gland and instruction manual | | |
| Plastic version, black | straight | 09 45 125 1560 |
| Metal version Standard, grey | straight | 09 45 115 1560 |
| Han® 3 A RJ45 connector insert<br>can be combined with Han® 3 A housing | straight | 09 45 100 1560 |
| Coding pin set | | 09 45 820 0000 |

Drawing — Dimensions in mm




Dimensions valid for plastic version, straight

Assembled system cables see catalogue “Intelligent Network Solutions”



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# Han® 3 A 2 x LC duplex

Han® 3 A 2 x LC duplex

Han

## Advantages

- Compact, space-saving Design
- Just one LWL modul for high mechanical load
- High packing density
- A & B parts identification according to TIA 568 standard

## Technical characteristics

| | |
|---|---|
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Housing material | Zinc die-cast<br>powder coating black |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| Multimode GOF | 09 57 467 0004 000 | | |
| Singlemode GOF | 09 57 467 0005 000 | | |
| **Connector** | | | |
| Multimode GOF | 09 57 407 0001 000 | | |
| Singlemode GOF | 09 57 407 0002 000 | | |



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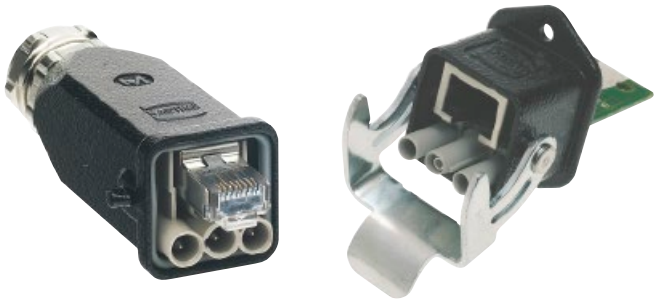
# Han® 3 A RJ45 Hybrid



Han® 3 A RJ45 Hybrid

## Advantages

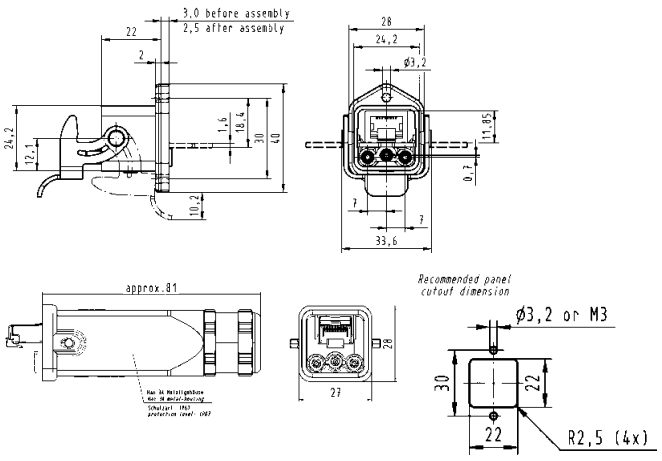
- RJ45 Ethernet-Data connector suitable for industry with Power contacts for hybrid applications
- Field-assembly with mounting tool
- Category of transmission Cat. 5
- Compact design and very robust housing
- Suitable for termination with solid and stranded cables
- Protection against direct contact on cable and device side according to EN 60529

Reference note:
For cat. 6 patch cords it is recommended to use 1 connector with a white cable manager and one with a blue cable manager, in order to optimise the crosstalk between different signal pairs.

## Technical characteristics

| | |
|---|---|
| Degree of protection | IP65 / IP67 |
| Mating interface | RJ45, 8-poles acc. to IEC 60603-7 plus 3x power |
| Temperature range | -40 °C … +70 °C |
| Housing material | Zinc die-cast, powder coating black |
| Data | |
| Transmission performance | Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1 |
| Transmission rate | 10/100/1000 Mbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Cable diameter stranded | AWG 28/7 - AWG 24/7 |
| Power | |
| Number of contacts | 3 (AC: L1, PE, N / DC: V+, GND, V-) |
| Working voltage | 300 V AC/DC |
| Working current | 12 A @ 70 °C (see current carrying capacity Han D® contacts) |
| Cable diameter | 2.5 mm² |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Components device side** | | | |
| incl. 3x Han D® female contacts | | | |
| AC version | 09 57 368 0500 000 | | |
| DC version | 09 57 368 0501 000 | | |
| **Cable side** | | | |
| Connector incl. 3x Han D® male contacts | | | |
| AC version | 09 57 308 0500 000 | | |
| DC version | 09 57 308 0501 000 | | |
| suitable assembly tool | 09 45 800 0520 | | |



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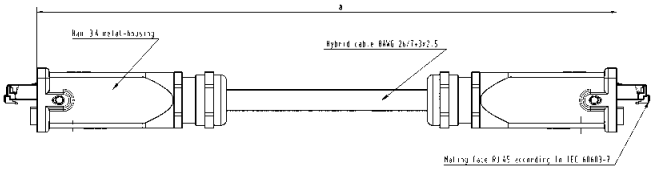
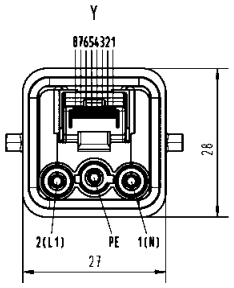
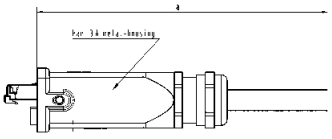
## Hybrid cable assembly



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Hybrid cable, double ended, 4 x 2 x AWG 26/7 + 3 x 2.5 mm²** | | double ended | |
| Length: 1 m | |  | |
| AC version | 33 57 211 0010 001 | | |
| DC version | 33 57 211 0010 002 | a = length | |
| Length: 5 m | | | |
| AC version | 33 57 211 0050 001 | | |
| DC version | 33 57 211 0050 002 | | |
| Length: 10 m | |  | |
| AC version | 33 57 211 0100 001 | | |
| DC version | 33 57 211 0100 002 | | |
| Length: 20 m | | | |
| AC version | 33 57 211 0200 001 | | |
| DC version | 33 57 211 0200 002 | | |
| **Hybrid cable, single ended, 4 x 2 x AWG 26/7 + 3 x 2.5 mm²** | | Protection level: IP65 / IP67 | |
| Length: 1 m | | | |
| AC version | 33 57 111 0010 002 | Data part: Transmission properties in accordance with ISO/IEC 11801:2002: Class D | |
| DC version | 33 57 111 0010 001 | | |
| Length: 5 m | | | |
| AC version | 33 57 111 0050 002 | | |
| DC version | 33 57 111 0050 001 | | |
| Length: 10 m | | single ended | |
| AC version | 33 57 111 0100 002 |  | |
| DC version | 33 57 111 0100 001 | | |
| Length: 20 m | | a = length | |
| AC version | 33 57 111 0200 002 | | |
| DC version | 33 57 111 0200 001 | | |
| **Hybrid outdoor cable** | | | |
| Length: 10 m | 33 57 851 0100 001 | PVC jacket | |
| Length: 20 m | 33 57 851 0200 001 | 4 x 2 x AWG 26/7 + 3 x 2.5 mm² | |
| Length: 500 m | 33 57 851 5000 001 | Outer diameter: 12 mm | |
| | | Min. bending radius: single: 5 x OD repeated: 10 x OD | |



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# Han® 3 A LC duplex Hybrid

Han® 3 A LC duplex Hybrid



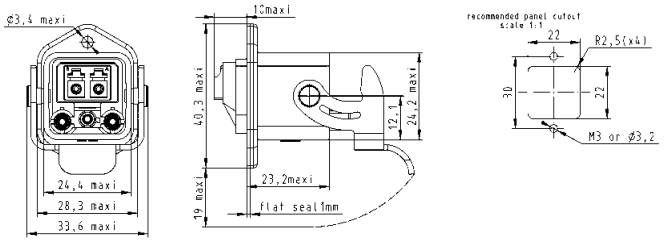
## Advantages

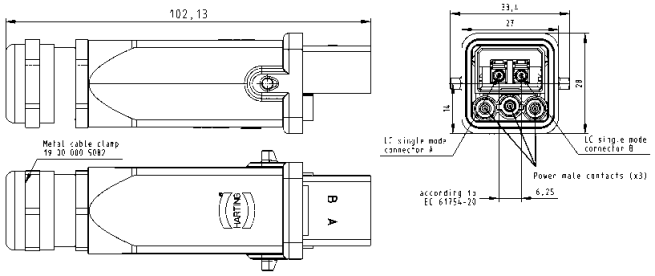
- Small form factor (compared to SC and ST®)
- Compact, space-saving Design
- Combined to only one LWL-module for high mechanical load
- High packing density
- A & B parts identification according to TIA 568 standard

## Technical characteristics

| | |
|---|---|
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C … +70 °C |
| Data | |
| Mating module | LC duplex (2 fibres) |
| Cable diameter | 6.0 … 9.0 mm |
| Power | |
| Number of contacts | 3 (AC: L1, PE, N / DC: V+, GND, V-) |
| Working voltage | 300 V AC/DC |
| Working current | 12 A @ 70°C |
| Housing material | Aluminium die-cast, black |

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Components device side** | | | | |
| Power: 3x Han D® male contacts | | | | |
| Data: Multimode GOF | AC | 09 57 568 0500 000 | | |
| | DC | 09 57 568 0510 000 | | |
| Data: Singlemode GOF | AC | 09 57 568 0501 000 | | |
| | DC | 09 57 568 0511 000 | | |
| **Connector** | | | | |
| Power: 3x Han D® female contacts | | | | |
| Data: Multimode GOF | AC | 09 57 508 0500 000 | | |
| | DC | 09 57 508 0510 000 | | |
| Data: Singlemode GOF | AC | 09 57 508 0501 000 | | |
| | DC | 09 57 508 0511 000 | | |



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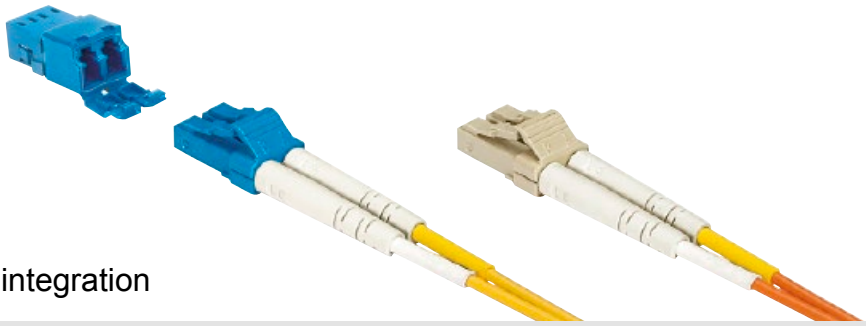
# Han® 3 A LC duplex



LC duplex IP20 adapter for device integration

Han

## Advantages

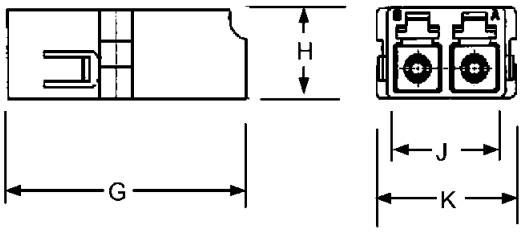
- Small form factor (compared to SC and ST®)
- Compact, space-saving Design
- High packing density
- A & B partsidentification according to TIA 568 standard
- Complement adapter for IP67 connector on device side

## Technical characteristics

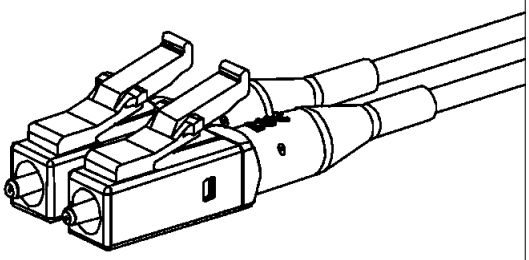
| | |
|---|---|
| Degree of protection | IP20 |
| Mating interface | LC duplex with two fibres |
| Temperature range | -40 °C … +70 °C |

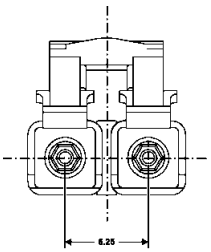
| Identification | Part number |
|---|---|
| Device side Adapter | |
| Multimode GOF | 09 57 400 0003 000 |
| Singlemode GOF | 09 57 400 0004 000 |
| Connector LC duplex | |
| Multimode GOF | 09 57 400 0001 000 |
| Singlemode GOF | 09 57 400 0002 000 |

Drawing — Dimensions in mm




| | min. | max. |
|---|---|---|
| G | 26.60 | 26.80 |
| H | 9.35 | 9.45 |
| J | 12.80 | 12.90 |
| K | 15.24 | 15.34 |





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# Han® 3 A RJ45 Hybrid

Han® 3 A RJ45, Hybrid

## General information

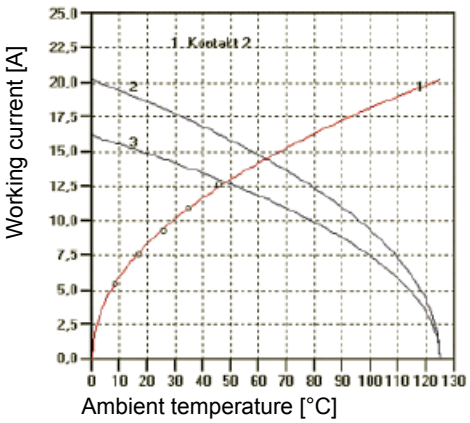
With the RJ Industrial Hybrid connector, HARTING has developed an interface solution that integrates the data lines and the power supply into one connector for hybrid Ethernet networks. The connector's geometry nevertheless maintains a clear separation between the data and the power contacts. This brings a significant reduction in the costs of installation and of field devices suitable for industrial application with hybrid cabling.

The panel feed-through is compatible with RJ45 connectors, which means that the standard patch cables for service and test purposes can be used. The data lines are connected at the rear via an RJ45 jack, while the power lines use a cage clamp terminal.

Optional the hybrid interface can be integrated in the device directly, thus preventing the use of rear side data lines.

The four power contacts of the hybrid module have also been designed with HARAX® rapid termination technology, allowing stranded cables of up to 1.5 mm² to be connected.

Current carrying capacity „Power contacts“




1 Temperature rise

2 Derating

3 Derating curve at $I_{max}$ * 0.8 (DIN IEC 512)

## Technical characteristics

| | |
|---|---|
| Connector | |
| Degree of protection | IP65 / IP67 |
| Mating interface | RJ45, 4-poles acc. to IEC 60603-7 plus 4x power |
| Temperature range | -40 °C … +70 °C |
| Housing material | |
| Plastic version | UL 94 V0, black |
| Metal version | Zinc die-cast, grey |
| Mating cycles | min. 500 |
| Mounting | field-assembly |
| Data Cat. 5, 4-poles | |
| Transmission performance | Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, prEN 50173-1 |
| Transmission rate | 10/100 Mbit/s |
| Cable diameter | |
| stranded | AWG 24/7 - AWG 22/7 |
| solid | AWG 23/1 - AWG 22/1 |
| Data Cat. 6, 8-poles | |
| Transmission performance | Category 6 / Class $E_A$ up to 500 MHz acc. to ISO/IEC 11801:2002, prEN 50173-1 |
| Transmission rate | 10/100 Mbit/s / 1 Gbit/s |
| Cable diameter | |
| stranded / solid | AWG 27 - AWG 22 |
| Both, data Cat. 5 and Cat. 6 | |
| Shielding | fully shielded, 360° shielding contact |
| Cable outer diameter | 10.0 mm – 11.0 mm |
| Power | |
| Number of contacts | 4 for cable diameter 1.5 mm² stranded |
| Working voltage | 48 V |
| Working current | 16 A, see current carrying capacity |
| | UL approved (E102079) |
| Panel feed-through | |
| Mating interface extern: | RJ45 female acc. to IEC 60603-7 plus 4 x power |
| Mating interface intern: | RJ45 female acc. to IEC 60603-7 4 x power via cable cage clamp 1.5 mm² |





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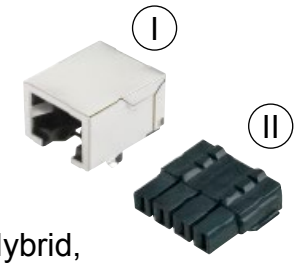
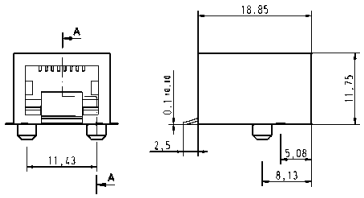
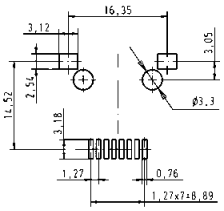
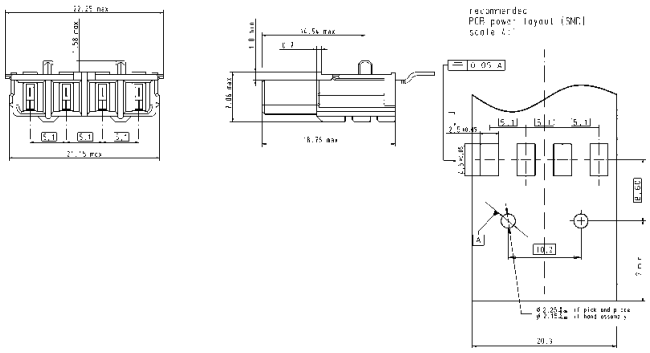
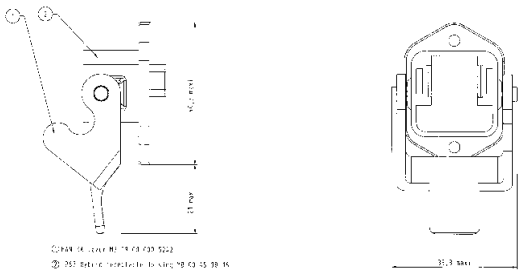
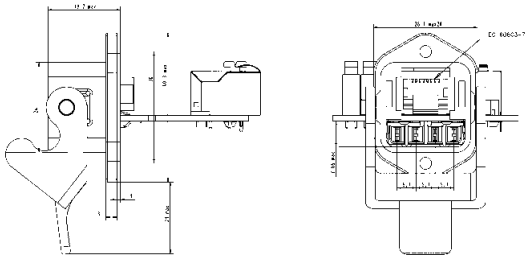
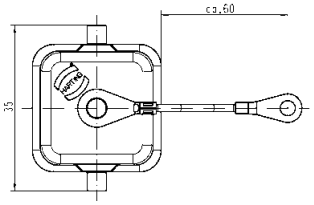
# Han® 3 A RJ45 Hybrid



Han® 3 A, Hybrid, components device side panel feed-throughs

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **RJ45 female**<br>for direct device integration<br>solder variant SMD<br>90° angled<br>I | <br><br>09 45 551 1100[1]<br>09 45 551 1110[2] |  | pcb layout<br>  |
| **Power module with 4 contacts**<br>for direct device integration<br>Reel with 100 pieces<br>II | <br>09 45 525 0040<br>09 45 525 0041 |  | |
| **Housing** bulkhead mounting **separate**<br>incl. flat seal<br>for direct device integration<br>Plastic version, black<br>Metal version Standard, grey<br>Metal version M, black<br>Metal version EMC, unpainted<br>III | <br><br><br>09 45 525 0021<br>10 12 005 1004<br>09 45 525 0027<br>09 45 525 0028 |  | Dimensions valid for plastic version |
| **Panel feed-through set**<br>Plastic version, black, Cat. 5<br>Metal version Standard, grey, Cat. 5<br>Metal version M, black, Cat. 5<br>Metal version Standard, grey, Cat. 6<br>Metal version M, black, Cat. 6<br>IV | <br>09 45 225 1300<br>10 12 005 1002<br>09 45 215 1301<br>09 45 215 1760<br>09 45 215 1761 |  | |
| **Protection cover for panel feed-through**<br>IP65 / IP67<br>Plastic version, black<br>Metal version Standard, grey<br>Metal version M, black | <br><br>09 20 003 5449<br>09 20 003 5425<br>09 37 003 5405 |  | |

[1] Packaging: Blister à 120 pieces
[2] Packaging: Tape & Reel à 130 pieces

Technical characteristics and general informations see page 04.15



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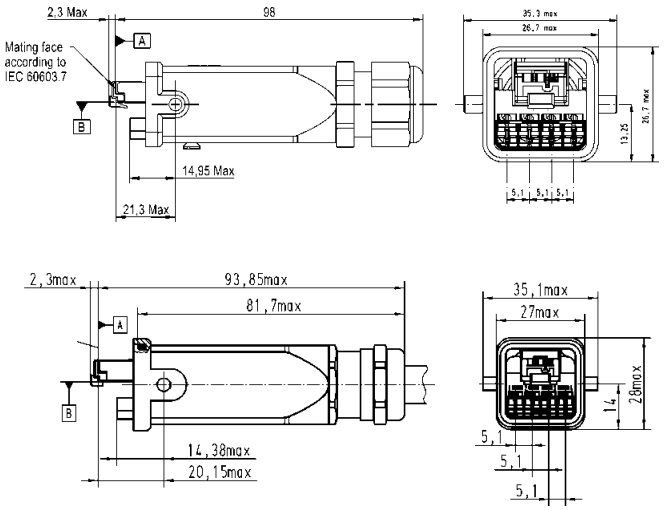
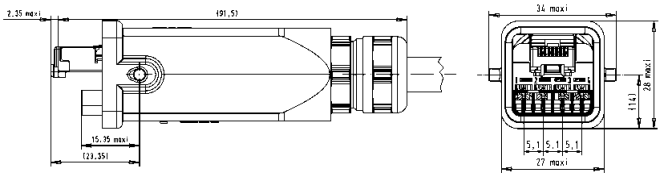
## Han® 3 A RJ45, Hybrid

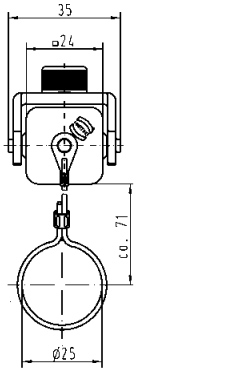


| Identification | Part number |
|---|---|
| **Connector, Cat. 5, 4 + 4-poles**<br>(IDC termination for RJ45 insert) | |
| Plastic version, black | 09 45 125 1300 |
| Metal version Standard, grey | 10 12 005 2001 |
| **Connector, Cat. 6, 8 + 4-poles**<br>(IDC termination for RJ45 insert) | |
| Plastic version, black | 09 45 125 1760 |
| Metal version Standard, grey | 09 45 115 1760 |
| Connector insert for Han® 3 A housings | 09 45 100 1760 |
| **Connector, Cat. 6, 8 + 4-poles**<br>(with piercing connection AWG 28/7 - 24/7) | |
| Plastic version, black | 09 45 125 1720 |
| Metal version Standard, grey | 09 45 115 1720 |
| Connector insert for Han® 3 A housings | 09 45 100 1720 |
| suitable assembly tool | 09 45 800 0520 |
| **Protection cover for connector**<br>IP65 / IP67 without seal | |
| Plastic version, black | 09 20 003 5442 |
| Metal version Standard, grey | 09 20 003 5422 |
| Metal version M | 09 37 003 5402 |

Drawing / Dimensions in mm






Dimensions valid for plastic version

Technical characteristics and general informations see page 04.15



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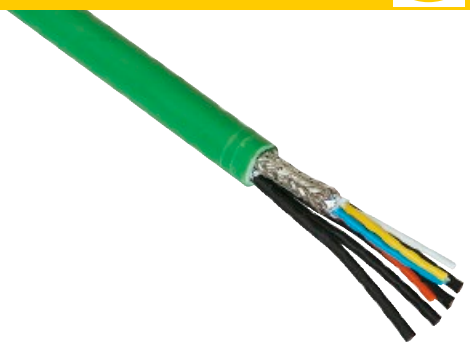
# Han® 3 A RJ45 Hybrid



PROFINET Type B cable, Hybrid
Industrial Cat. 5 Hybrid cable, 4-wire + 4x Power
to make up Hybrid system cables



## Advantages

- Robust design for industrial environment
- PROFINET-conform
- Additional power supply
- Hybrid Cat. 5 cable, 4-wire + 4x Power

## Technical characteristics

| | |
|---|---|
| Cable construction | Star quad + 4 Power cables, double shielded |
| Core structure | 4 x AWG 22/7 + 4 x 1.5 mm² (conductor 84 x 0.15 mm²) |
| Sheath material | FRNC |
| Cable outer diameter | 9.7 mm |
| Transmission performance | Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1 |
| Transmission rate | 10/100 Mbit/s |
| Shielding | Shielding foil and shielding braid |
| Temperature range | -20 °C … +70 °C |
| Standard lengths | 10 m / 20 m / 50 m / 100 m |
| Colour | green |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| PROFINET Type B cable, Hybrid Industrial Cat. 5 Hybrid cable, 4-wire + 4x Power | | | |
| 10 m ring | 09 45 600 0310 | | |
| 20 m ring | 09 45 600 0330 | | |
| 50 m ring | 09 45 600 0340 | | |
| 100 m ring | 09 45 600 0300 | | |
| 500 m reel | 09 45 600 0320 | | |

Assembled system cables see catalogue “Intelligent Network Solutions”

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# Han® 3 A RJ45 Hybrid

Industrial Cat. 6 Hybrid
Installation cable, 8-wire



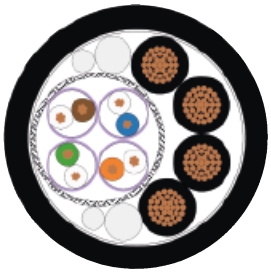
## Advantages

- Robust design for industrial environment
- PROFINET-conform
- Additional power supply
- Hybrid Cat. 6 cable, 4-wire + 4x Power

## Technical characteristics

| | |
|---|---|
| Cable structure | 4 x 2, Twisted Pair, shielded, PIMF<br>4 power cores |
| Core structure | 4 x 2 x AWG 26/7, stranded<br>4x 84 * 0.15 mm (cord 1.5 mm²), stranded |
| Sheath material | PUR |
| Cable sheath diameter | 10 ... 10.6 mm |
| Transmission performance | Category 6 / Class E up to 250 MHz according to ISO/IEC 11 801:2002, EN 50 173-1 |
| Transmission rate | 10/100/1000 Mbit/s |
| Shielding | Paired shielded with additional cable shield |
| Operating temperature range | –20 °C … +80 °C |
| Supply lengths | 20 m / 50 m / 100 m<br>other lengths on request |
| Colour | black |

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Industrial Cat. 6 Hybrid installation cable, 8-wire<br>PUR | | | |
| 20 m ring | 09 45 600 0332 | | |
| 50 m ring | 09 45 600 0342 | | |
| 100 m drum | 09 45 600 0302 | | |





Assembled system cables see catalogue “Intelligent Network Solutions”

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## Features

General Description

The Han-Brid® series allows the connection of a data interface and a power supply in a single space saving connector. This means that it is now possible to provide data transmission and power to devices in a single bus structure. This hybrid connector family includes provision for connection of a max. 50 V, 10 A power supply together with a range of inserts for connection of a variety of data protocols and transmission medias:

- Han-Brid® F.O. for plastic (POF) or for HCS®* optical fibre
- Han-Brid® Cu for shielded twisted pair.
- Han-Brid® Quintax 3 A for shielded 4 wire bus systems (2 pair STP)
- Han-Brid® RJ45 C for Ethernet application
- Han-Brid® USB / Firewire for fast data transmission

Han-Brid® inserts fit to the standard plastic as well as metal hoods and housings with seal of the Han® 3A series offering a degree of protection IP65 according to DIN EN 60 529. For harsher environments Han® 3 HPR hoods and housings with a degree of protection of IP68 can be used.

## Power supply

- Han D® male and female with standard crimp contacts
- Rated current 10 A
- Rated voltage 50 V
- Wire gauge 0.14 - 2.5 mm²
- Approval





* HCS® Hard Clad Silica (is registered trade mark of the SpecTran Corporation)

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## Data interfaces

Han-Brid® F.O.

- Is suitable for all HP Versatile Link (Horizontal Package) transmitters and receivers
- Data rates: Standard 12 Mbit/s, suitable for all common fieldbus systems
- Insert allows integration of HP standard contacts for POF and HCS®* fibres
- Temperature range -40 °C ... +70 °C

Han-Brid® Cu

- For termination of a shielded twisted pair
- Insert for 2x Han D® male or female contacts
- Connection of the shield by means of shielding plate and fixing clamps
- Connection of the device side can be realized either by a printed circuit board as a modular version or as part of the appliance PCB
- Insert for bulkhead mounted housing or the coupling housing are always equipped with a screening spring

Bus Terminator

- Active bus terminator in male and female version
- Standard Han® 3 A hoods and housings
- Power supply to the termination network via electrical contacts of Han-Brid®
- Integrated, galvanically separated DC/DC converter 24 V / 5 V

Han-Brid® Quintax 3 A

- Possibility to terminate shielded 4 wires conductors (2 pair STP)
- Suitable for all 4-wire bus systems
- Suitable for shielded cable conductor diameter 3 – 9.5 mm
- Transmission of shielding separately from the hood's ground
- Connections are carried out acc. to DIN EN 50 173, Cat. 5
- Temperature range -40 °C ... +70 °C

Han-Brid® RJ45 C

- Suitable for standard RJ45 Plug and Jack, shielded version
- Connections provided for conductors acc. to DIN EN 50 173, Cat. 5
- Termination from the device side is carried out via a PCB, two versions are possible: modular version or as part of the appliance PCB
- Assembly with standard tools
- Insert for 2 Han-D® male or female contacts offers the combination with electrical bus connector
- Rated current 10 A
- Rated voltage 24 V
- Wire gauge 0.14 - 2.5 mm²

Han-Brid® USB

- Insert for all Han® 3 A hoods and housings
- Hood with glued sealing
- Simple and low-cost termination via insert of a patch cable
- Strain-relief via cable tie

Han-Brid® FireWire

- Insert for all Han® 3 A hoods and housings
- Hood with glued sealing
- Simple and low-cost termination via insert of a patch cable
- Strain-relief via cable tie
- Compatible to IEEE 1394





* HCS® Hard Clad Silica (is registered trade mark of the SpecTran Corporation)

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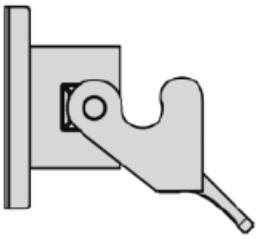
## Overview (Sample: Han-Brid® Cu)

Thermoplastic
09 20 003 0320 (light grey)
09 20 003 0327 (black)

Metal
09 20 003 0301



Device side
09 12 006 2611
09 12 006 2695
09 12 006 2694

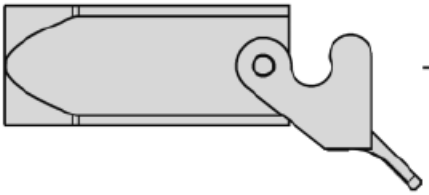
Cable side
09 12 006 3111

Thermoplastic
09 20 003 0423 (light grey)
09 20 003 0426 (black)
19 20 003 0423 (light grey)
19 20 003 0427 (black)

Metal
09 20 003 1443
19 20 003 1443

Thermoplastic
09 20 003 0720 (light grey)
09 20 003 0727 (black)
19 20 003 0720 (light grey)
19 20 003 0727 (black)

Metal
09 20 003 1750
19 20 003 1750

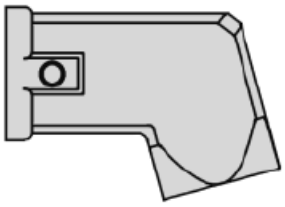


Device side
09 12 006 2701
09 12 006 2795
09 12 006 2794

Cable side
09 12 006 3001

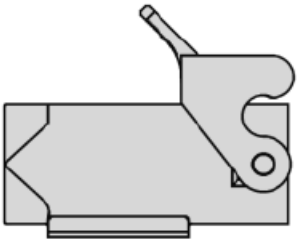
Thermoplastic
09 20 003 0623 (light grey)
09 20 003 0626 (black)
19 20 003 0623 (light grey)
19 20 003 0627 (black)

Metal
09 20 003 1643
19 20 003 1643



Thermoplastic
09 20 003 0220 (light grey)
09 20 003 0227 (light grey)
19 20 003 0220 (light grey)
19 20 003 0227 (black)

Metal
09 20 003 1250
19 20 003 1250





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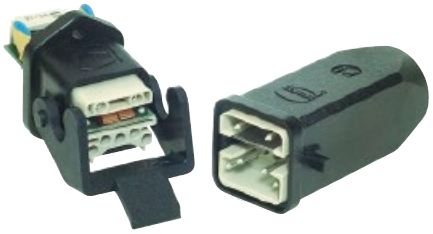
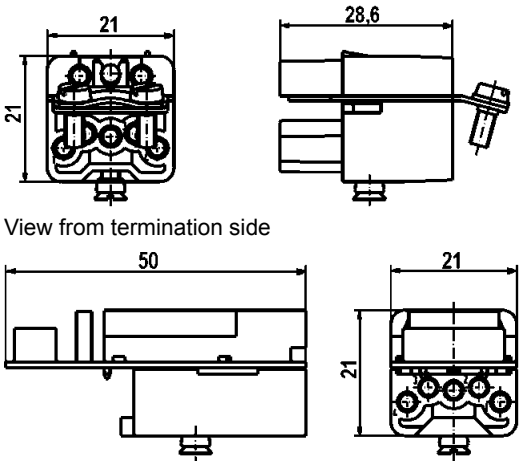
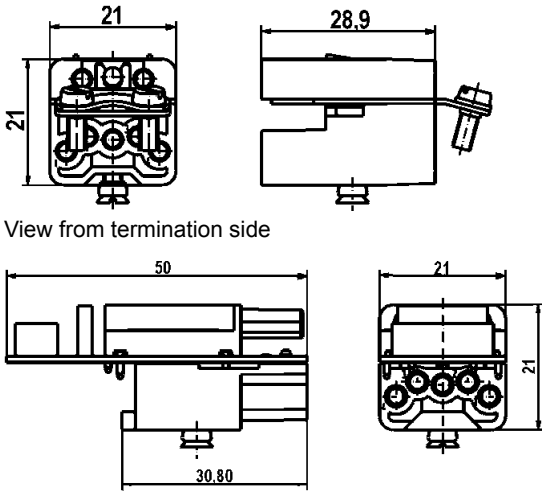


Hybrid field bus connector
for shielded twisted pair
+ 4 electrical contacts 10 A
+ option for PE

| Identification | Part number Male insert (M) | Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Cable side<br>Female insert | **09 12 006 3111** | | | |
| Device side<br>Male insert | 09 12 006 2611<br>Also available as single part<br>loaded<br>09 12 002 2611<br>unloaded<br>09 12 002 3011 | Also available as single part<br>unloaded<br>09 12 004 3011 | | |
| Cable side<br>Male insert | **09 12 006 3001** | | | |
| Device side<br>Female insert | 09 12 006 2701<br>Also available as single part<br>loaded<br>09 12 002 2701<br>unloaded<br>09 12 002 3101 | Also available as single part<br>unloaded<br>09 12 004 3101 | | |






**Stock items in bold type**

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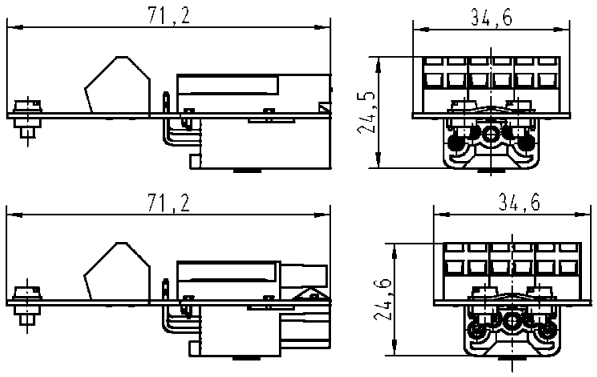
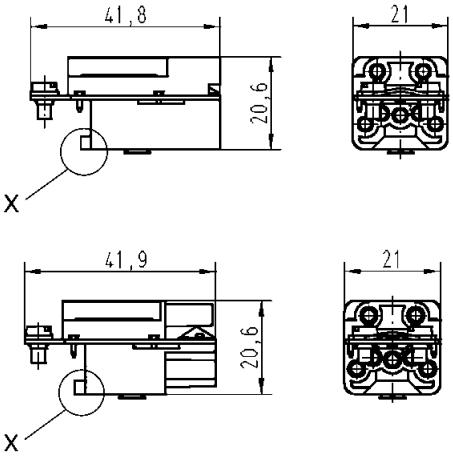
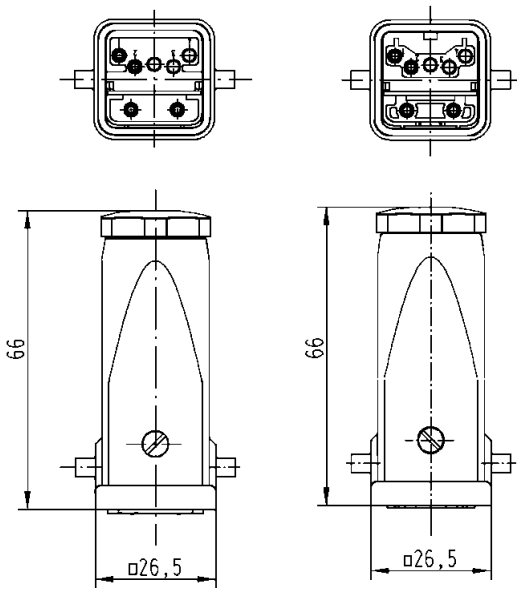
| Identification | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Panel feed-through<br>with cage clamp<br> | **09 12 006 2695** | **09 12 006 2795** |  | |
| Coupling / Panel feed-through<br> <br>X = Cutting off the fin allows the use in cable to cable housings | **09 12 006 2694** | **09 12 006 2794** |  | |
| Bus terminator<br>Plastic hoods/housings<br> <br>Hoods/Housings, metal<br> | **09 12 006 2691**<br>**09 12 006 2692** | 09 12 006 2791<br>09 12 006 2792 |  | |

**Stock items in bold type**



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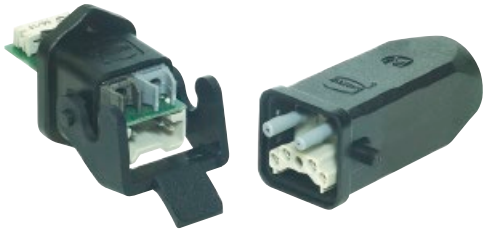
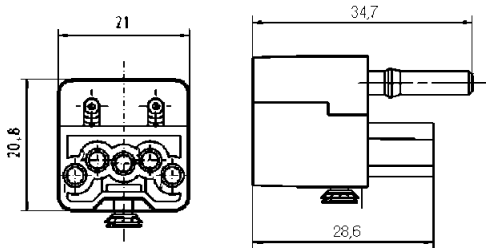
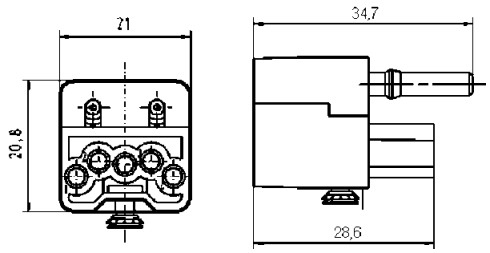
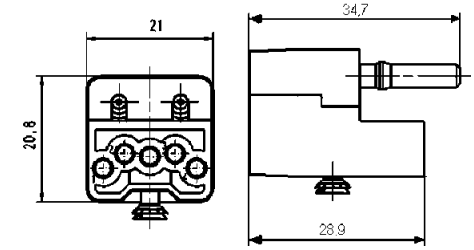
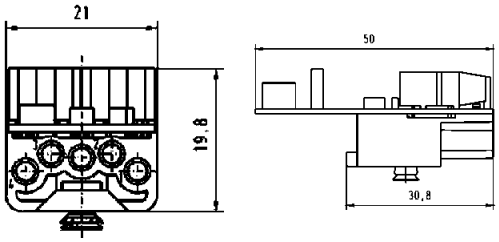


Hybrid field bus connector
with F.O. transmitter and receiver
+ 4 electrical contacts 10 A
+ option for PE



| Identification | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Cable side**<br>F.O. (m) + Han D® (f) | Also available as single part<br><br>for POF<br>09 12 004 2711<br><br>for POF crimpless<br>09 12 004 2713<br><br>for HCS®* fibre<br>09 12 004 2716 | Also available as single part<br><br>for POF<br>09 12 004 3111<br><br>for POF crimpless<br>09 12 004 3113<br><br>for HCS®* fibre<br>09 12 004 3116 |  <br>View from termination side | |
| **Device side**<br>F.O. (f) + Han D® (m) | for POF<br>09 12 004 2611<br><br>for POF crimpless<br>09 12 004 2611<br><br>for HCS®* fibre<br>09 12 004 2611 | for POF<br>09 12 004 3011<br><br>for POF crimpless<br>09 12 004 3011<br><br>for HCS®* fibre<br>09 12 004 3011 |  <br>View from termination side | |
| **Cable side**<br>F.O. (m) + Han D® (m) | Also available as single part<br><br>for POF<br>09 12 004 2601<br><br>for POF crimpless<br>**09 12 004 2603**<br><br>for HCS®* fibre<br>09 12 004 2606 | Also available as single part<br><br>for POF<br>09 12 004 3001<br><br>for POF crimpless<br>09 12 004 3003<br><br>for HCS®* fibre<br>**09 12 004 3006** |  <br>View from termination side | |
| **Device side**<br>F.O. (f) + Han D® (f) | for POF<br>09 12 004 2701<br><br>for POF crimpless<br>09 12 004 2701<br><br>for HCS®* fibre<br>09 12 004 2701 | for POF<br>09 12 004 3101<br><br>for POF crimpless<br>09 12 004 3101<br><br>for HCS®* fibre<br>09 12 004 3101 |  <br>View from termination side | |

* HCS®=Hard Clad Silica (is registered trade mark of the SpecTran Corporation)

**Stock items in bold type**



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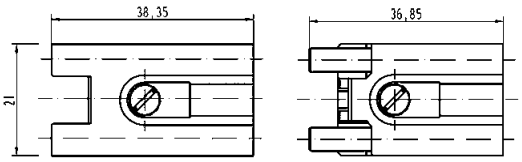
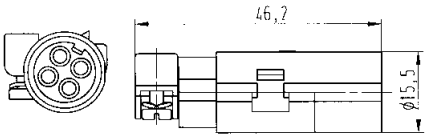
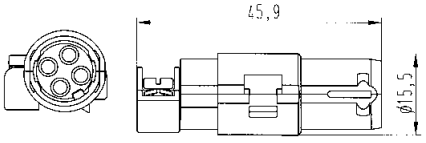
# Han-Brid® Quintax 3 A 50 V 10 A

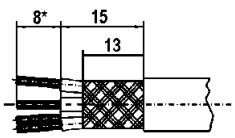
4 contacts + shielding
+ 2 power contacts
suitable in Han® 3 A metric
hoods and housings

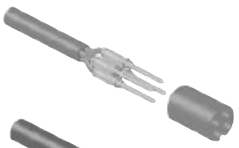
| Identification | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Quintax insert | **09 15 003 3001** | **09 15 003 3101** |   | |
| Quintax contacts<br>Zinc alloy<br>Order crimp contacts separately Special clamp for cable diameter 3 - 6 and 6 - 9.5 mm included in delivery range | **09 15 004 3013** | **09 15 004 3113** | M   F   | |

## Assembly instructions

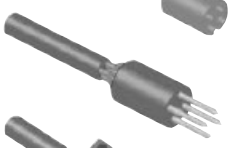
Quintax-Z-contact

1. Strip cable acc. to drawing 1 and fold the shielding over the cable.
2. Crimp Han D® contacts onto the wires.

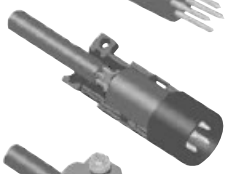
1.  

2. 

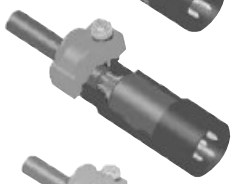
3. Insert Han D® contacts into corresponding cavaties of insulator until they are snapped in.

3. 

4. Fit the insert including the cable into the opened shielded bushing. The coding pin of the shielded bushing has to meet the groove of the insulator.

4. 

5. Clamp the tilt over the shielding onto the cable by means of the special clamp (small opening for cable diameter of 3 - 6 mm, large opening for cable diameter of 6 - 9.5 mm).

5. 

6. Check the wiring.

7. Close the shielded bushing with the cover and insert it into the corresponding cavity of the Quintax Module as usual.

6.



**Stock items in bold type**

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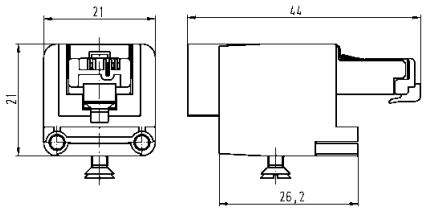
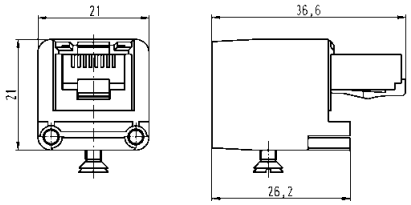
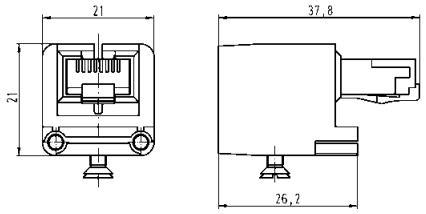
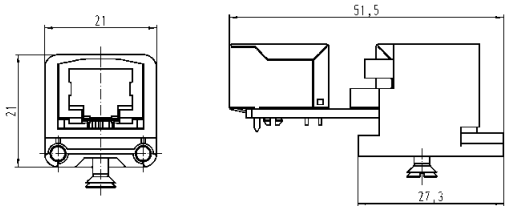
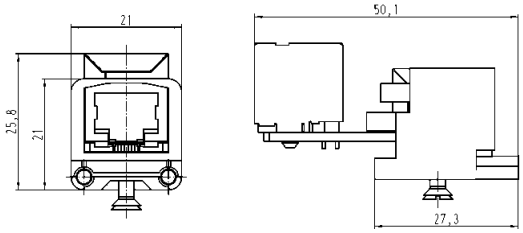
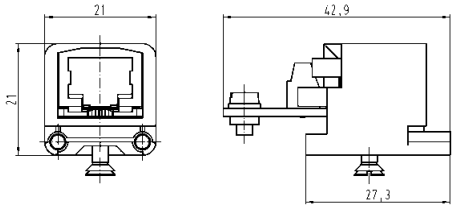
Hybrid network connector
+ 2 electrical contacts 10 A



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Han-Brid® RJ45 C<br>with RJ Industrial | **09 12 003 3011** |   | |
| Han-Brid® RJ45 C<br>with Stewart RJ45 | **09 12 003 3021** |   | |
| Han-Brid® RJ45 C<br>with HIROSE RJ45 | **09 12 003 3031** |   | |
| Panel feed-through<br>straight | **09 12 003 2774** |   | |
| Panel feed-through<br>angled | **09 12 003 2776** |   | |
| Panel feed-through<br>with 4-pole terminal block | **09 12 003 2770** |   | |



**Stock items in bold type**

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## Han-Brid® USB

### Features

- Insert for all Han® 3 A hoods and housings
- Hood with glued sealing
- Simple and low-cost termination via insert of a patch cable
- Strain-relief via cable tie

### Technical characteristics

USB style A, 2.0 Standard

| | |
|---|---|
| Specifications | DIN VDE 0110<br>DIN EN 61984 |
| Number of contacts | 4 |
| Electrical data<br>acc. to EN 61984 | **1 A 50 V 0.8 kV 3** |
| Rated current | 1 A |
| Rated voltage | 50 V |
| Rated impulse voltage | 0.8 kV |
| Pollution degree | 3 |
| Material | Polycarbonate |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Contact resistance | ≥ 4 mΩ |
| Temperature range | -40 °C ... 85 °C |
| Flammability acc. to UL 94 | V0 |
| Mechanical working life<br>- mating cycles | ≥ 500 |

## Han-Brid® FireWire

### Features

- Insert for all Han® 3 A hoods and housings
- Hood with glued sealing
- Simple and low-cost termination via insert of a patch cable
- Strain-relief via cable tie
- Compatible to IEEE 1394

### Technical characteristics

Firewire IEEE 1394

| | |
|---|---|
| Specifications | DIN VDE 0110<br>DIN EN 61984 |
| Number of contacts | 6 |
| Electrical data<br>acc. to EN 61984 | **1 A 50 V 0.8 kV 3** |
| Rated current | 1 A |
| Rated voltage | 50 V |
| Rated impulse voltage | 0.8 kV |
| Pollution degree | 3 |
| Material | Polycarbonate |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Contact resistance | ≥ 4 mΩ |
| Temperature range | -40 °C ... 85 °C |
| Flammability acc. to UL 94 | V0 |
| Mechanical working life<br>- mating cycles | ≥ 500 |



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# Han-Brid® USB / Han-Brid® FireWire 50 V 1 A

| Identification | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Han-Brid® USB | **09 12 001 2794** | **09 12 001 3091** | | |
| Han-Brid® FireWire | **09 12 001 2774** | **09 12 001 3071** | | |



**Stock items in bold type**

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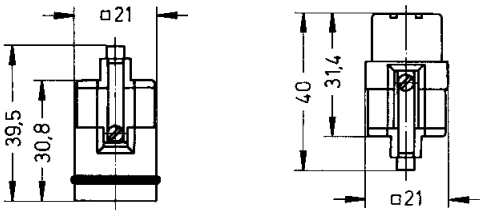
# Han® Q 5/0 inserts with PCB-adapter

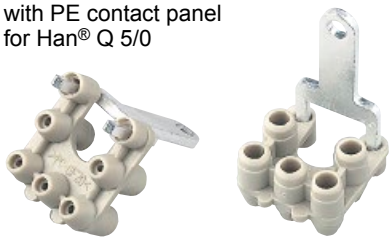
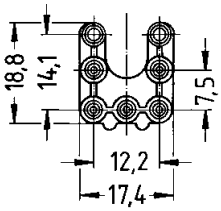
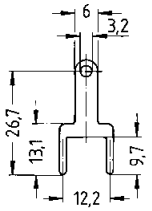
230/400 V 16 A

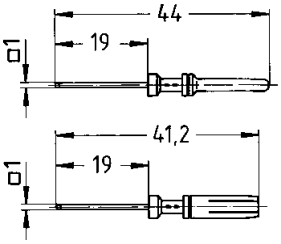
Han

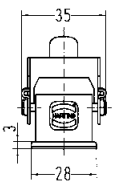
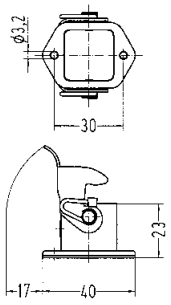
Device side

| Insert | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Order contacts separately | **09 12 005 3001** | **09 12 005 3101** |  | |

[1] Distance for contact max. 21 mm

| PCB-adapter | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| with PE contact panel for Han® Q 5/0  | 09 12 000 9905 |  Adapter |  PE contact panel |

| Solder contacts | Part number Male contact | Part number Female contact | Drawing | Dimensions in mm |
|---|---|---|---|---|
| to connect the PCB-adapter | 09 33 000 6195 | 09 33 000 6295 |  | |

| Housing bulkead mounting | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| | 09 62 003 0304 | Panel cut out 22 x 22 mm   | |

Cable side

Further informations see HARTING catalogue "Industrial Connectors Han®, chapter Q"



**Stock items in bold type**

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# Han® Q 5/0 with PCB-adapter

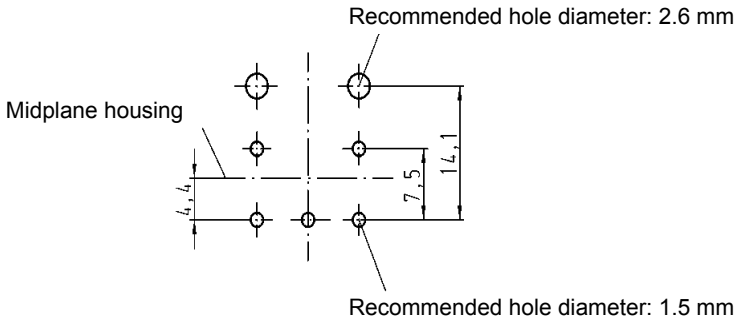
## Features

- ❏ Robust design
- ❏ Suitable for EMC housings
- ❏ Low wiring costs
- ❏ Additional robust and secure PE-connection between housing and PCB

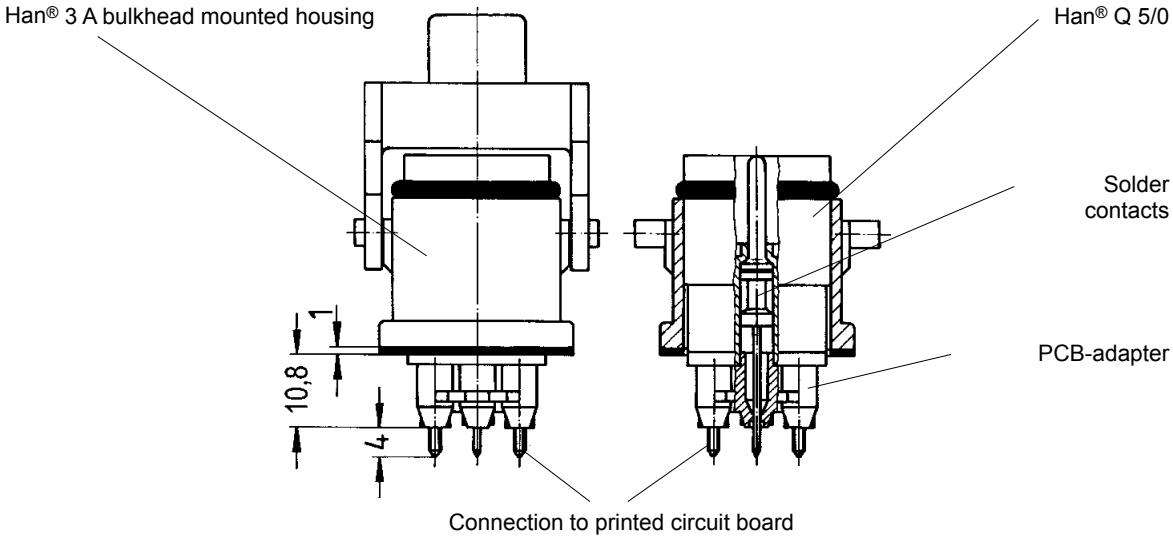
## Technical characteristics

| | |
|---|---|
| Approvals | |
| **Inserts** | |
| Number of contacts | 5 |
| Electrical data acc. to DIN EN 61984 | **10 A 230/400 V 4 kV 3** |
| Working current | |
| Working voltage conductor – ground | |
| Working voltage conductor – conductor | |
| Rated impulse voltage | |
| Pollution degree | |
| - pollution degree 2 also | 10 A 320/500 V 4 kV 2 |
| Working voltage acc. to UL/CSA | 400 V |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Material | Polycarbonate |
| Limiting temperatures | -40 °C … +125 °C |
| Flammability acc. to UL 94 | V0 |
| Mechanical working life | |
| - Mating cycles | ≥ 500 |

## Layout of printed circuit boards




## Assembly situation





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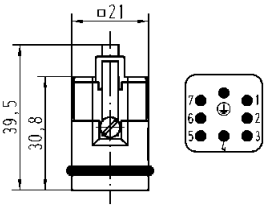
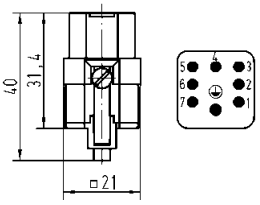
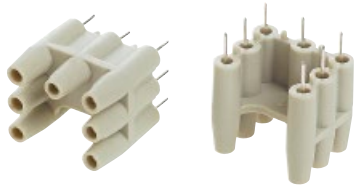
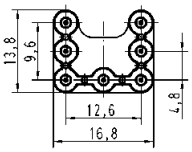
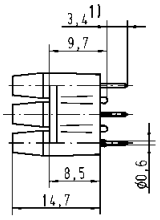
# Han® Q 7/0 inserts with PCB-adapter

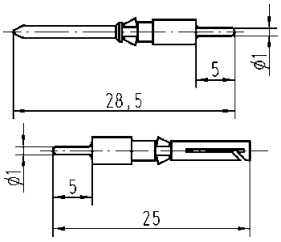
250 V 7.5 A

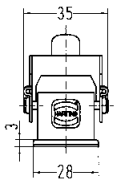
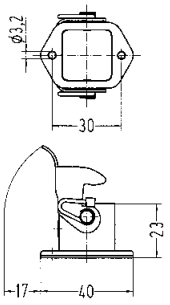
Han

Device side

| Insert | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Order contacts separately | **09 12 007 3001** | **09 12 007 3101** |  |  |
| Coding | **09 12 000 9901** | **09 12 000 9902** | | |

| PCB-adapter | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| for PCB up to 2.4 mm  | 09 12 000 9908 |  |  |

| Solder contacts | Part number Male contact | Part number Female contact | Drawing | Dimensions in mm |
|---|---|---|---|---|
| to connect the PCB-adapter | 09 15 000 6190 | 09 15 000 6290 |  | |

| Housing bulkead mounting | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| | **09 20 003 0301** | Panel cut out 22 x 22 mm  |  |

Cable side

Further informations see HARTING catalogue "Industrial Connectors Han®, chapter Q"



**Stock items in bold type**

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# Han® Q 7/0 with PCB-adapter

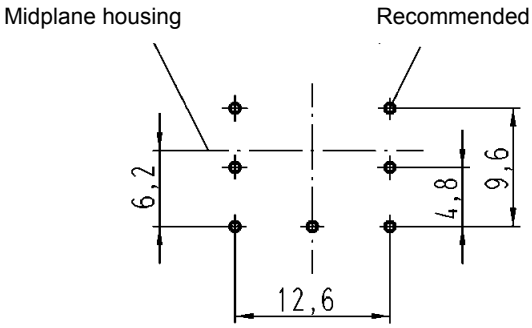
## Features

- ❏ Robust design
- ❏ Suitable for standard and EMC housings
- ❏ Low cost wiring
- ❏ High contact density

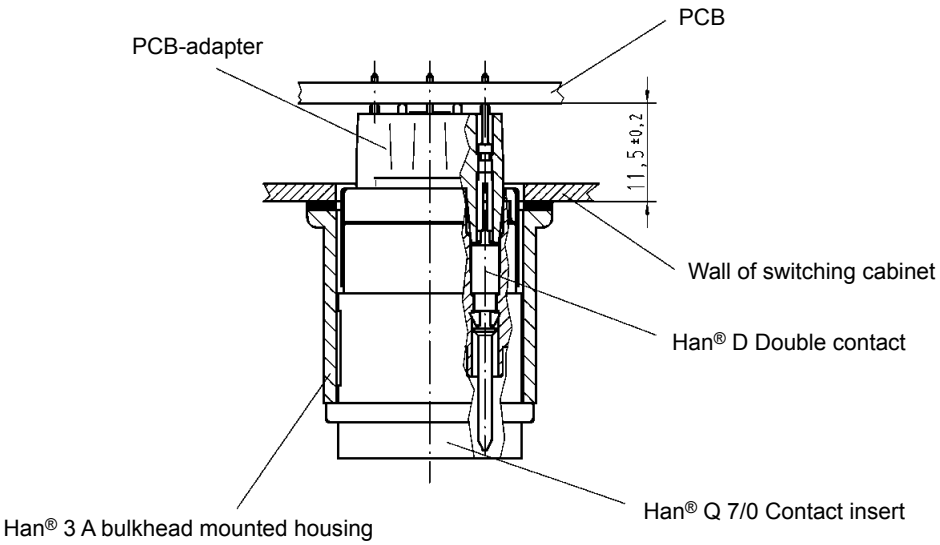
## Technical characteristics

| | |
|---|---|
| Approvals | |
| **Inserts** | |
| Number of contacts | 7 |
| Electrical data acc. to DIN EN 61984 | **7.5 A 250 V 4 kV 3** |
| Working current | |
| Working voltage | |
| Rated impulse voltage | |
| Pollution degree | |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Material | Polycarbonate |
| Limiting temperatures | -40 °C … +125 °C |
| Flammability acc. to UL 94 | V0 |
| Mechanical working life - Mating cycles | ≥ 500 |

## Layout of printed circuit boards




## Assembly situation





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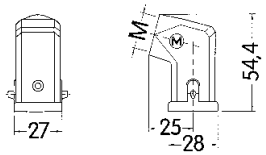
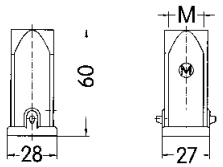
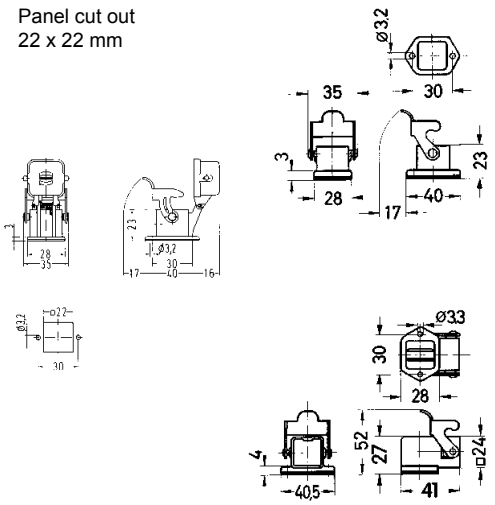
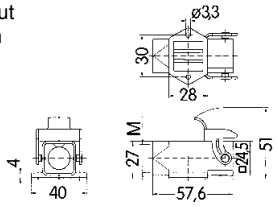
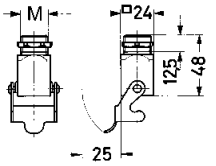
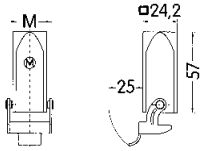
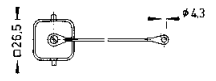
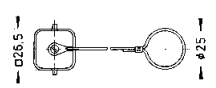
# Hoods/Housings metal

Size 3 A

| Identification | | Part number | M | Drawing | Dimensions in mm |
|---|---|---|---|---|---|
| **Hoods** | | | | | |
| Hood<br>side-entry | | **19 20 003 1640** | 20 |  | |
| Hood<br>top-entry | | **19 20 003 1440** | 20 |  | |
| Protection covers<br>for hoods | | **09 20 003 5422**[1]<br>**09 20 003 5421**[2] | | | |
| **Housings** | | | | | |
| Housings<br>bulkhead mounting | | **09 20 003 0301** | | Panel cut out<br>22 x 22 mm  | |
| with fixed cover<br>without sealing | | **09 20 003 0305**[1] | | | |
| with sealing | | **09 20 003 0306**[2] | | | |
| | | **09 20 003 0801** | | | |
| Housing<br>surface mounting<br>1 side-entry | | **19 20 003 1250** | 20 | Panel cut out<br>22 x 22 mm  | |
| bottom closed | | **19 20 003 1252** | 20 | | |
| Housing<br>screw mounting | | **19 20 003 1150** | 20 |  | |
| Hood<br>cable to cable | | **19 20 003 1750** | 20 |  | |
| Protection covers<br>for housings | | **09 20 003 5426**[1]<br>**09 20 003 5425**[2] | |  | |
| for hoods cable to cable | | 09 20 003 5428[1]<br>**09 20 003 5427**[2] | |  | |

[1] for mounted male insert
[2] for mounted female insert

**Stock items in bold type**



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| Identification | | Part number | M | Drawing | Dimensions in mm |
|---|---|---|---|---|---|
| Hoods | **Hoods**<br>side-entry | grey<br>19 20 003 0620<br><br>black<br>19 20 003 0627 | 20<br><br>20 | | |
| | **Hoods**<br>top-entry | grey<br>**19 20 003 0420**<br><br>black<br>19 20 003 0427 | 20<br><br>20 | | |
| | **Protection covers**<br>for hoods | 09 20 003 5442[1]<br>09 20 003 5441[2] | | | |
| Housings | **Housings**<br>bulkhead mounting | grey<br>**09 20 003 0320**<br><br>black<br>**09 20 003 0327**<br><br>grey<br>**09 20 003 0820**<br><br>black<br>**09 20 003 0827** | –<br><br>–<br><br>–<br><br>– | Panel cut out 22 x 22 mm | |
| | **Housings**<br>surface mounting<br>1 side-entry | grey<br>**19 20 003 0220**<br><br>black<br>**19 20 003 0227** | 20<br><br>20 | Panel cut out<br>22 x 22 mm | |
| | **Hoods**<br>cable to cable | grey<br>**19 20 003 0720**<br><br>black<br>19 20 003 0727 | 20<br><br>20 | | |
| | **Protection covers** | for housings A<br>09 20 003 5407[1][3]<br>**09 20 003 5408**[2][3]<br><br>B<br>**09 20 003 5445**[2]<br>09 20 003 5446[1]<br>09 20 003 5447[2][3]<br><br>for hoods cable to cable C<br>09 20 003 5448[1]<br>09 20 003 5449[2] | | | |

[1] for mounted male insert
[2] for mounted female or Han-Brid® insert
[3] for metal housings and cable to cable hoods also

**Stock items in bold type**



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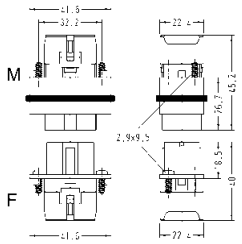
# Han® Q 4/2 inserts with PCB-adapter

230/400 V 16 A

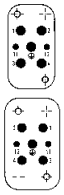
Han

Device side

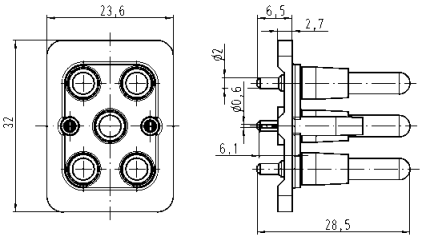
| Insert | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Order contacts separately | **09 12 006 3041** | **09 12 006 3141** | | |



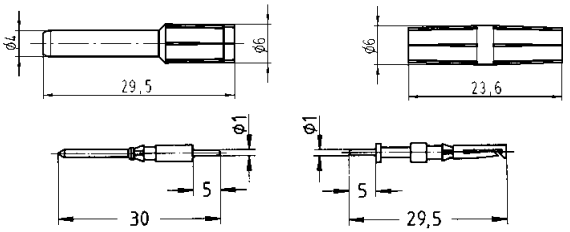

Contact arrangement
View from termination side



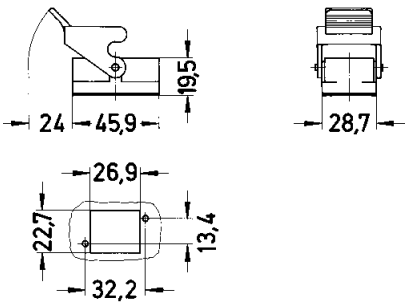
| PCB-adapter | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| for PCBs up to 2.4 mm | 09 12 006 9901 | | |




| Han® Q 4/2 double contacts | Part number Male contact | Part number Female contact | Drawing | Dimensions in mm |
|---|---|---|---|---|
| to connect the PCB adapter<br>Power contact | 09 32 000 6180 | 09 32 000 6280 | | |
| Signal contact | 09 15 000 6191 | 09 15 000 6293 | | |




| Housing bulkead mounting | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Plastic | 09 12 008 0327 | Panel cut out | |




Cable side

Further informations see HARTING catalogue "Industrial Connectors Han®, chapter Q"



**Stock items in bold type**

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# Han® Q 4/2 with PCB-adapter

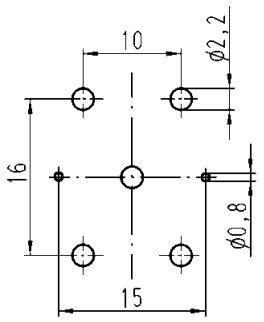
## Features

- ❏ Robust Design
- ❏ Suitable for Han-Compact® hoods and housings
- ❏ Low wiring costs
- ❏ High contact density

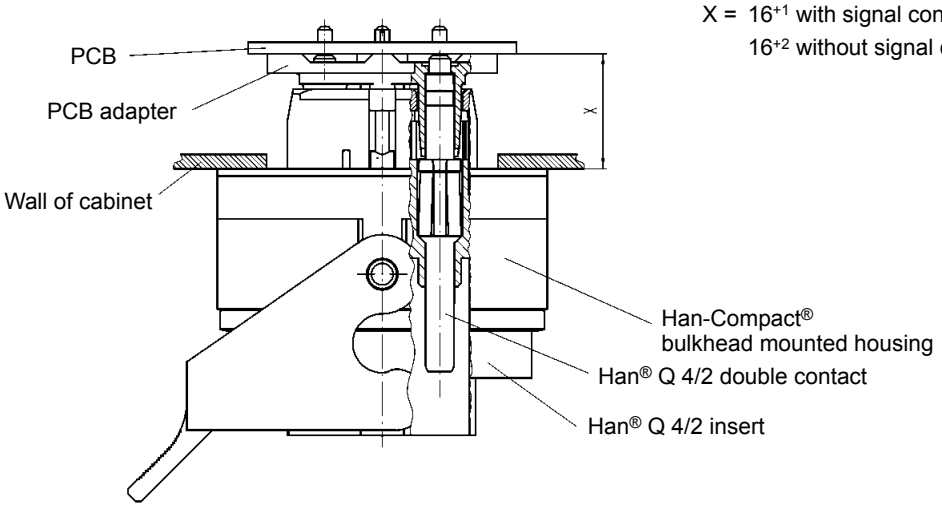
## Technical characteristics

| | |
|---|---|
| Approvals | |
| Number of contacts | 4/2 + PE |
| Electrical data acc. to DIN EN 61984 | |
| Power area | 30 A 400/690 V 6 kV 2 |
| Rated current | 30 A |
| Rated voltage | |
| conductor - ground | 400 V |
| conductor - conductor | 690 V |
| Rated impulse voltage | 6 kV |
| Pollution degree | 2 |
| Signal area | 7.5 A 250 V 4 kV 2 |
| Rated current | 7.5 A |
| Rated voltage | 250 V |
| Rated impulse voltage | 4 kV |
| Pollution degree | 2 |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Material | LCP |
| Limiting temperatures | -40 °C ... +125 °C |
| Flammability acc. to UL 94 | V0 |
| Mechanical working life | ≥ 500 mating cycles |

## Layout of printed circuit boards




## Assembly situation





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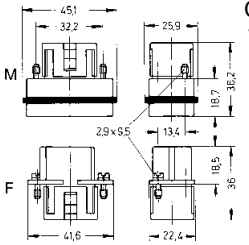
# Han® Q 8/0 inserts with PCB-adapter

230/400 V 16 A

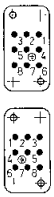
Han

Device side

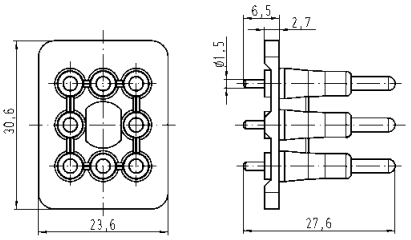
| Insert | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Order contacts separately | **09 12 008 3001** | **09 12 008 3101** | | |



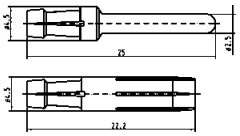

Contact arrangement
View from termination side



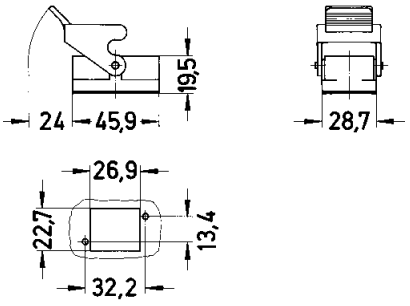
| PCB-adapter | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| for PCBs up to 1.6 mm | 09 12 008 9901 | | |




| Han® Q 8/0 double contacts | Part number Male contact | Part number Female contact | Drawing | Dimensions in mm |
|---|---|---|---|---|
| to connect the PCB adapter | 09 33 000 6180 | 09 33 000 6280 | | |



| Housing bulkead mounting | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Plastic | 09 12 008 0327 | Panel cut out | |




Cable side

Further informations see HARTING catalogue "Industrial Connectors Han®, chapter Q"



**Stock items in bold type**

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# Han® Q 8/0 with PCB-adapter

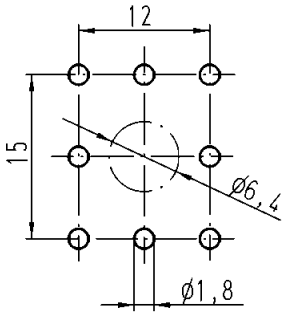
## Features

- ❏ Robust Design
- ❏ Suitable for Han-Compact® hoods and housings
- ❏ Low wiring costs
- ❏ High contact density

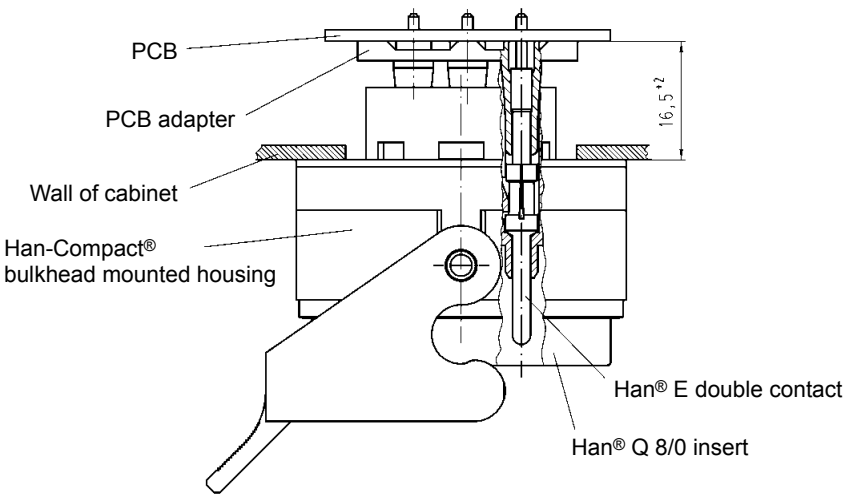
## Technical characteristics

| | |
|---|---|
| Approvals | , |
| Number of contacts | 8 |
| Electrical data acc. to DIN EN 61 984 | 16 A 230/400 V 4 kV 2 |
| Rated current | 16 A |
| Rated voltage | |
| conductor - ground | 230 V |
| conductor - conductor | 400 V |
| Rated impulse voltage | 4 kV |
| Pollution degree | 2 |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Material | LCP |
| Limiting temperatures | -40 °C ... +125 °C |
| Flammability acc. to UL 94 | V0 |
| Mechanical working life | ≥ 500 mating cycles |

## Layout of printed circuit boards




## Assembly situation





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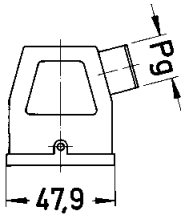
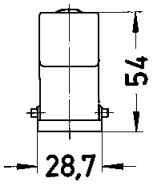
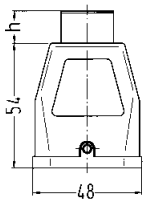
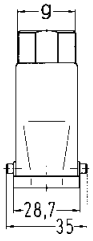
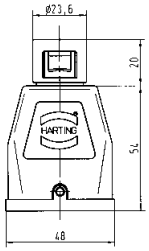
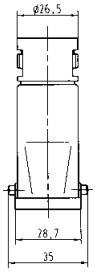
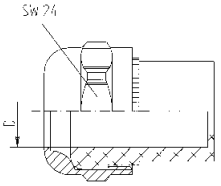
## thermoplastic / metal



| Identification | | Part number | | Drawing | Dimensions in mm |
|---|---|---|---|---|---|
| **Hoods** | | | | | |
| **Hoods**<br>Thermoplastic<br>side-entry<br>Cable gland order separately | | **09 12 008 0527** | Pg 16 |  |  |
| **Hoods**<br>Thermoplastic<br>top-entry<br>Cable gland order separately | | **19 12 008 0429**<br>**09 12 008 0427**<br>**09 12 008 0429** | M 25<br>Pg 16<br>Pg 21 |  <br>h / g<br>14 / M 25x1.5<br>13 / Pg 16<br>13 / Pg 21 |  |
| **Hoods**<br>Thermoplastic<br>top-entry<br>Cable gland order separately | | 09 12 008 0428 | Pg 16 |  |  |
| **Cable seal**<br>Thermoplastic<br>for hoods<br>Thrust bolt and insert | | **09 00 000 5059**<br>**19 12 000 5157**<br>**19 12 000 5158**<br>**09 00 000 5157**<br>**09 00 000 5158** | Pg 16<br>M 25<br>M 25<br>Pg 21<br>Pg 21 |  | |

| | cable | |
|---|---|---|
| | min. | max. |
| 09 00 000 5059 | 11.5 mm | 15.5 mm |
| 19 12 000 5157 | 10.5 mm | 14 mm |
| 19 12 000 5158 | 14 mm | 17 mm |
| 09 00 000 5157 | 14 mm | 18 mm |
| 09 00 000 5158 | 17 mm | 20.5 mm |



**Stock items in bold type**

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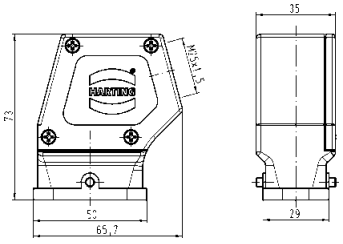
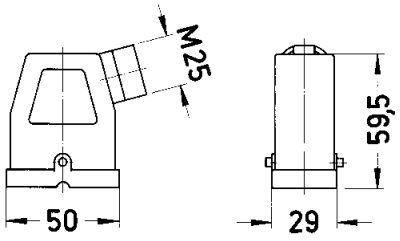
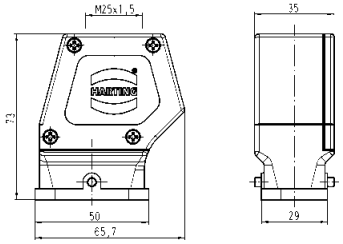
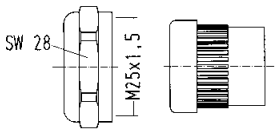
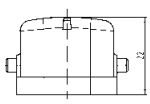
## thermoplastic / metal

| Identification | | Part number | | Drawing | Dimensions in mm |
|---|---|---|---|---|---|
| **Hoods** | | | | | |
| Hoods<br>Metal<br>side-entry<br>Cable gland order separately | | **19 12 008 0526** | M 25 |  | |
| Hoods<br>Metal<br>side-entry<br>Cable gland order separately | | black<br>chromated<br>19 12 008 0501<br><br>black<br>powder coated<br>19 12 708 0501<br><br>matt<br>nickel plated<br>19 12 008 0502 | M 25<br><br>M 25<br><br>M 25 |  | |
| Hoods<br>Metal<br>top-entry<br>Cable gland order separately | | **19 12 008 0426** | M 25 |  | |
| Cable seal<br>Metal<br>for hoods<br>Thrust bolt and insert | | 19 12 000 5057<br>**19 12 000 5058** | M 25<br>M 25 |  | |

| | cable | |
|---|---|---|
| | min. | max. |
| 19 12 000 5057 | 10.5 mm | 14 mm |
| 19 12 000 5058 | 14 mm | 17 mm |

| Identification | Part number for male insert | Part number for female insert | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Protection covers<br>Thermoplastic<br>for male insert | without sealing<br>09 12 008 5407 | with sealing<br>09 12 008 5408 |  | |





**Stock items in bold type**

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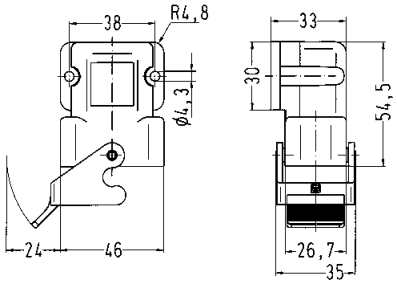
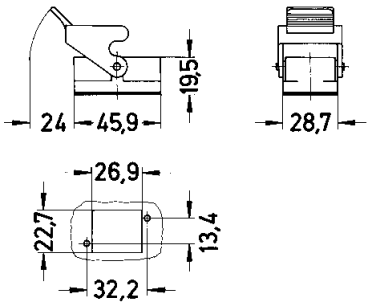
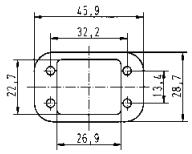
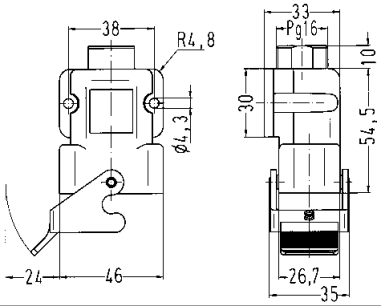
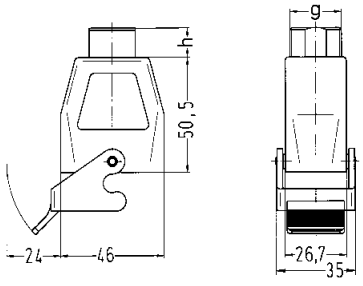
## thermoplastic / metal



| Identification | | Part number | | Drawing | Dimensions in mm |
|---|---|---|---|---|---|
| **Housings** | | | | | |
| Housings, bulkhead mounting<br>Thermoplastic<br>angled | | **09 12 008 0902** | Pg 16 |  | |
| Housings, bulkhead mounting<br>Thermoplastic | | **09 12 008 0327** | Pg 16 |  | |
| Gasket for housings bulkhead mounting<br>Han® Q 8/0 | | 09 12 000 9912 | |  | |
| Housings, surface mounting<br>Thermoplastic<br>angled<br>Cable gland order separately | | 09 12 008 0901 | Pg 16 |  | |
| Hoods, cable to cable<br>Thermoplastic<br>Cable gland order separately | | 09 12 008 0727<br>19 12 008 0729 | Pg 16<br>M 25 |  | |

| h | g |
|---|---|
| 13 | Pg 16 |
| 14 | M 25x1.5 |



**Stock items in bold type**

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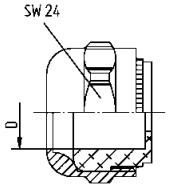
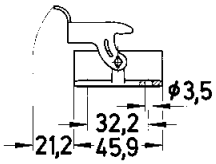
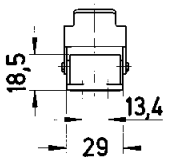
## thermoplastic / metal

| Identification | Part number | | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Housings** | | | | |
| **Cable seal**<br>Thermoplastic<br>for housings<br>Thrust bolt and insert | 09 00 000 5058 | Pg 16 |  | |

| | cable | |
|---|---|---|
| | min. | max. |
| 09 00 000 5058 | 11.5 mm | 15.5 mm |

| | | | | |
|---|---|---|---|---|
| **Housings, bulkhead mounting**<br>Metal | black<br>chromated<br>**09 12 008 0301**<br><br>black<br>powder coated<br>**09 12 708 0301**<br><br>matt<br>nickel plated<br>**09 12 008 0303** | |   | |





**Stock items in bold type**

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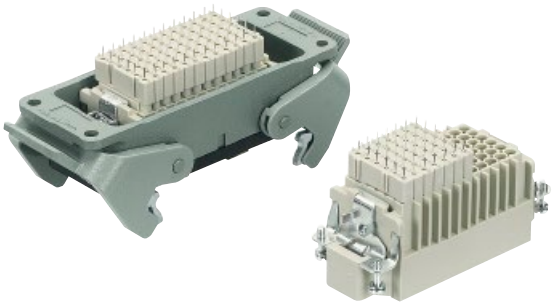
# Han DD® inserts with PCB-adapter

250 V 7.5 A



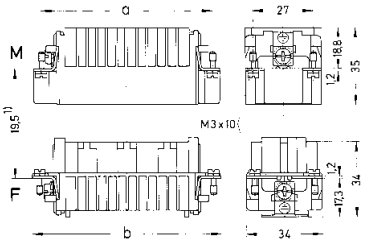
Han

Device side

## Insert

| Size | Part number Male insert (M) | Part number Female insert (F) |
|---|---|---|
| Order contacts separately | | |
| Han® 24 DD — 6 B | **09 16 024 3001** | **09 16 024 3101** |
| Han® 42 DD — 10 B | **09 16 042 3001** | **09 16 042 3101** |
| Han® 72 DD — 16 B | **09 16 072 3001** | **09 16 072 3101** |
| Han® 108 DD — 24 B | **09 16 108 3001** | **09 16 108 3101** |

Drawing




Dimensions in mm

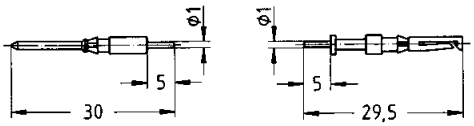
1) Distance for contact max. 21 mm

| | a | b |
|---|---|---|
| 24 DD | 44 | 51 |
| 42 DD | 57 | 64 |
| 72 DD | 77.5 | 84.5 |
| 108 DD | 104 | 111 |

## Han DD® double contacts

| | Part number Male contacts | Part number Female contacts |
|---|---|---|
| to connect the PCB-adapter | 09 15 000 6191 | **09 15 000 6291** |

Drawing

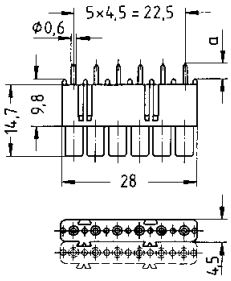



Dimensions in mm

## PCB adapter

| | Part number |
|---|---|
| for PCBs up to 1.6 mm | **09 16 000 9905** |
| for PCBs up to 2.4 mm | **09 16 000 9908** |

Drawing



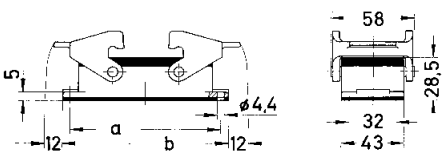

Dimensions in mm

| | a |
|---|---|
| 09 16 000 9905 | 2.6 |
| 09 16 000 9908 | 3.4 |

## Housing

| Size | Part number |
|---|---|
| 6 B | **09 30 006 0301** |
| 10 B | **09 30 010 0301** |
| 16 B | **09 30 016 0301** |
| 24 B | **09 30 024 0301** |

Drawing




Dimensions in mm

| Size | a | b | Panel cut out |
|---|---|---|---|
| 6 B | 70 | 80 | 48 x 35 |
| 10 B | 83 | 93 | 60 x 35 |
| 16 B | 103 | 113 | 82 x 35 |
| 24 B | 130 | 140 | 108 x 35 |

Size 6 B with 1 locking lever

Cable side

Further informations see HARTING catalogue "Industrial Connectors Han®, chapter DD"



**Stock items in bold type**

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# Han DD® with PCB-adapter

## Features

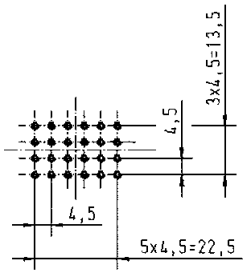
- ❏ Robust design
- ❏ Suitable for standard and EMC housing
- ❏ Low wiring costs
- ❏ Higher contact density

## Technical characteristics

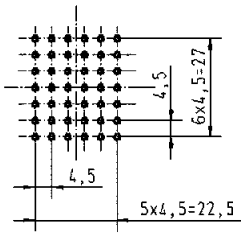
| | |
|---|---|
| Approvals | c UL us |
| **Inserts** | |
| Number of contacts | 24, 42, 72, 108 |
| Electrical data acc. to DIN VDE 0627 | **7.5 A 250 V 4 kV 3** |
| Working current | |
| Working voltage | |
| Rated impulse voltage | |
| Pollution degree | |
| Working voltage acc. to UL | 250 V |
| Testing voltage $U_{rms}$ | 2 kV |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Material | Polyamide |
| Limiting temperatures | -40 °C / +125 °C |
| Flammability acc. to UL 94 | HB |
| Mechanical working life - Mating cycles | ≥ 500 |
| Wire gauge | 0.14 - 2.5 mm² |

## Layout of printed circuit boards

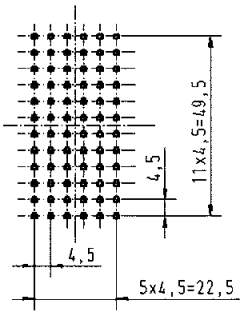
Han® 24 DD



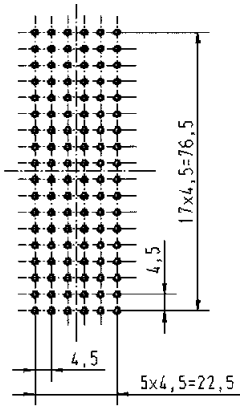

Han® 42 DD




Han® 72 DD

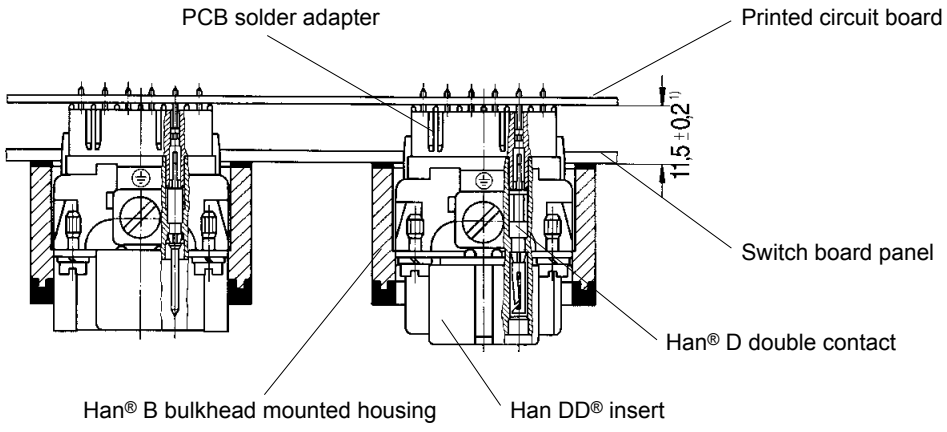



Han® 108 DD




Recommended hole diameter: 0.8 mm

## Assembly situation




1) for Han® B EMC hoods/housings spacing of 12.5 ± 0.2 is necessary as no flange seal is used.





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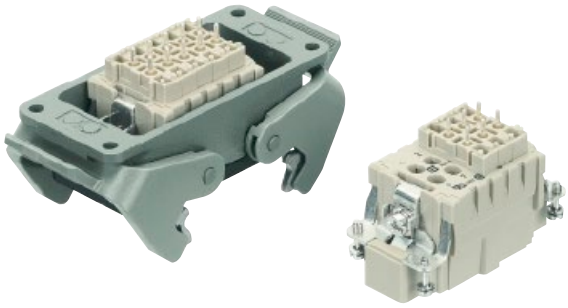
# Han E® inserts with PCB-adapter

500 V 16 A

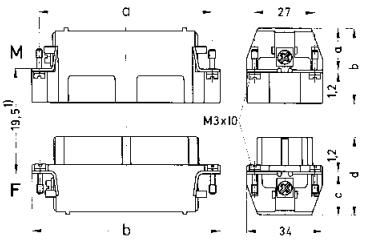


Han

Device side

| Inserts | Size | Part number Male insert (M) | Part number Female insert (F) |
|---|---|---|---|
| Order contacts separately | | | |
| Han® 6 E | 6 B | **09 33 006 2602** | **09 33 006 2702** |
| Han® 10 E | 10 B | **09 33 010 2602** | **09 33 010 2702** |
| Han® 16 E | 16 B | **09 33 016 2602** | **09 33 016 2702** |
| Han® 24 E | 24 B | **09 33 024 2602** | **09 33 024 2702** |

Drawing



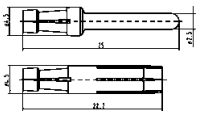

Dimensions in mm

1) Distance for contact max. 21 mm

| | a | b |
|---|---|---|
| 6 E | 44 | 51 |
| 10 E | 57 | 64 |
| 16 E | 77.5 | 84.5 |
| 24 E | 104 | 111 |

| Han E® double contacts | Part number Male contacts | Part number Female contacts |
|---|---|---|
| to connect the PCB-adapter | 09 33 000 6180 | 09 33 000 6280 |

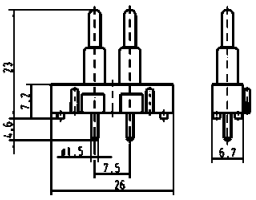
Drawing



Dimensions in mm

| PCB adapter | Part number |
|---|---|
| | 09 33 000 9996 |

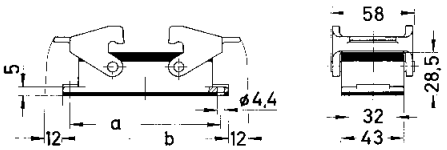
Drawing




Dimensions in mm

| Housing | Size | Part number |
|---|---|---|
| | 6 B | **09 30 006 0301** |
| | 10 B | **09 30 010 0301** |
| | 16 B | **09 30 016 0301** |
| | 24 B | **09 30 024 0301** |

Drawing




Dimensions in mm

| Size | a | b | Panel cut out |
|---|---|---|---|
| 6 B | 70 | 80 | 48 x 35 |
| 10 B | 83 | 93 | 60 x 35 |
| 16 B | 103 | 113 | 82 x 35 |
| 24 B | 130 | 140 | 108 x 35 |

Size 6 B with 1 locking lever

Cable side

Further informations see HARTING catalogue "Industrial Connectors Han®, chapter E"



**Stock items in bold type**

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# Han E® with PCB-adapter

## Features

- ❏ Robust design
- ❏ Suitable for standard and EMC housings
- ❏ Low wiring costs
- ❏ Counter connector available with screw, crimp or cage clamp termination

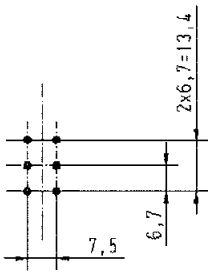
## Technical characteristics

### Inserts

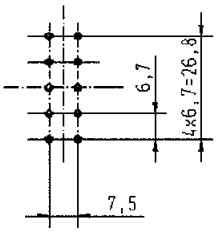
| | |
|---|---|
| Number of contacts | 6, 10, 16, 24 |
| Electrical data acc. to DIN EN 61984 | **16 A** **500 V** **6 kV** **3** |
| Working current | |
| Working voltage | |
| Rated impulse voltage | |
| Pollution degree | |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Material | Polycarbonate |
| Limiting temperatures | -40 °C / +125 °C |
| Flammability acc. to UL 94 | V0 |
| Mechanical working life - Mating cycles | ≥ 500 |
| Wire gauge | 0.5 - 4 mm² |

## Layout of printed circuit boards

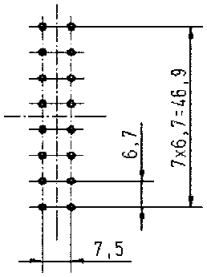
Han® 6 E



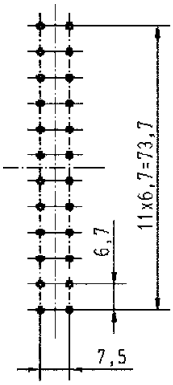

Han® 10 E




Han® 16 E

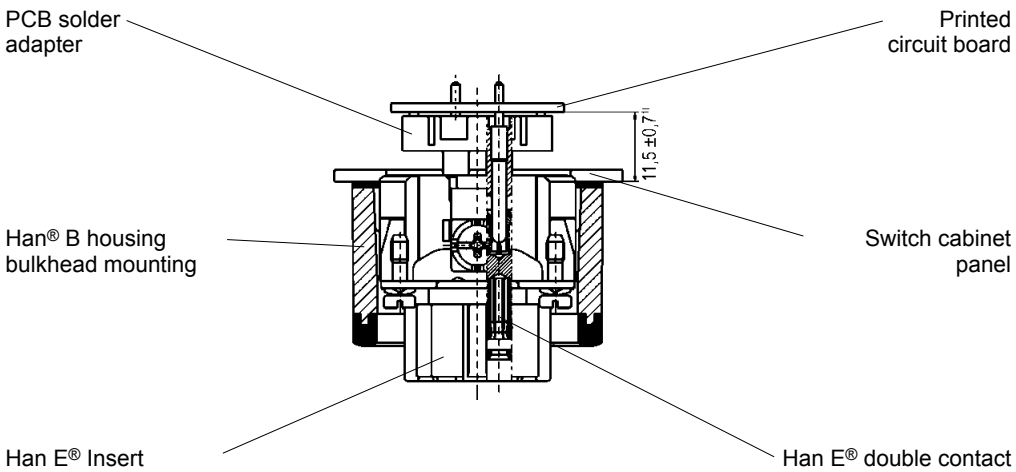



Han® 24 E




Recommended hole diameter: 1.8 mm

## Assembly situation




[1] for Han® B EMC hoods/housings spacing of 12.5 ± 0.7 is necessary as no flange seal is used





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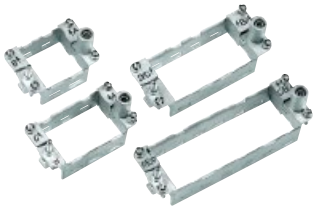
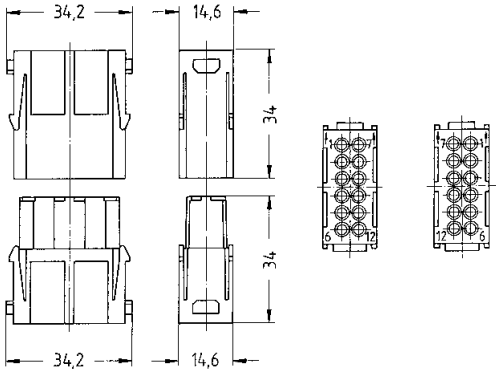
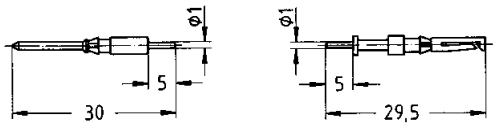
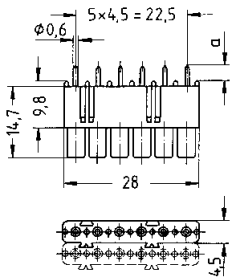
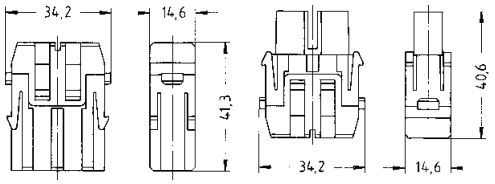
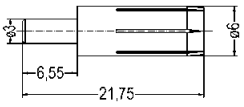
| Hinged frame | No. of modules | Part number Male insert (M) | Part number Female insert (F) | Size | Figure |
|---|---|---|---|---|---|
|  | 1 | **09 14 000 0304** | **09 14 000 0304** | 10 A | Drawings and further details see HARTING catalogue “Industrial Connectors Han®, chapter 06”. |
| | 2 | **09 14 006 0303** | **09 14 006 0313** | 6 B | |
| | 3 | **09 14 010 0303** | **09 14 010 0313** | 10 B | |
| | 4 | **09 14 016 0303** | **09 14 016 0313** | 16 B | |
| | 6 | **09 14 024 0303** | **09 14 024 0313** | 24 B | |

| Identification | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Han DD® module<br>PCB termination/<br>crimp termination<br> | **09 14 012 3001** | **09 14 012 3101** |  | |
| Han D® double contacts<br>to connect the PCB<br> | 09 15 000 6191 | **09 15 000 6291** |  | |
| PCB adapter<br>for PCBs up to 1.6 mm<br>for PCBs up to 2.4 mm<br> | **09 16 000 9905**<br>**09 16 000 9908** | |  | |

| | a |
|---|---|
| 09 16 000 9905 | 2.6 |
| 09 16 000 9908 | 3.4 |

| Han® axial screw module | Part number Male insert (M) | Part number Female insert (F) | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Axial screw termination<br>Cable side | **09 14 002 2601** | **09 14 002 2701** | | |
| PCB adaption<br>Device side<br> | 09 14 002 2603 | 09 14 002 2703 |  | |
| Solder contact<br> | 09 32 000 6295 | |  | |



**Stock items in bold type**

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# Han-Modular® with PCB-adapter

## Features

- ❏ Modular assembly
- ❏ Robust design
- ❏ Suitable for standard and EMC housings
- ❏ Low wiring costs

## Technical characteristics

### Han DD® module with PCB-adapter

| | |
|---|---|
| Number of contacts | 12 |
| Working current | 7.5 A |
| Working voltage | 250 V |
| Wire gauge | 0.14 - 2.5 mm² |

### Han® axial screw module for PCB adaptions

| | |
|---|---|
| Number of contacts | 2 |
| Working current | 40 A |
| Working voltage | 500 V |
| Wire gauge | 2.5 - 10 mm² |

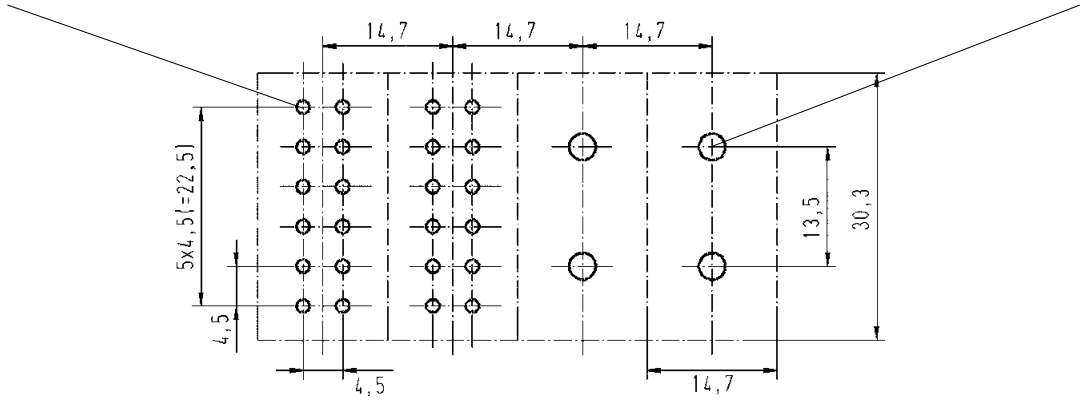


## Layout of printed circuit boards

Depiction

Recommended hole diameter: 0.8 mm

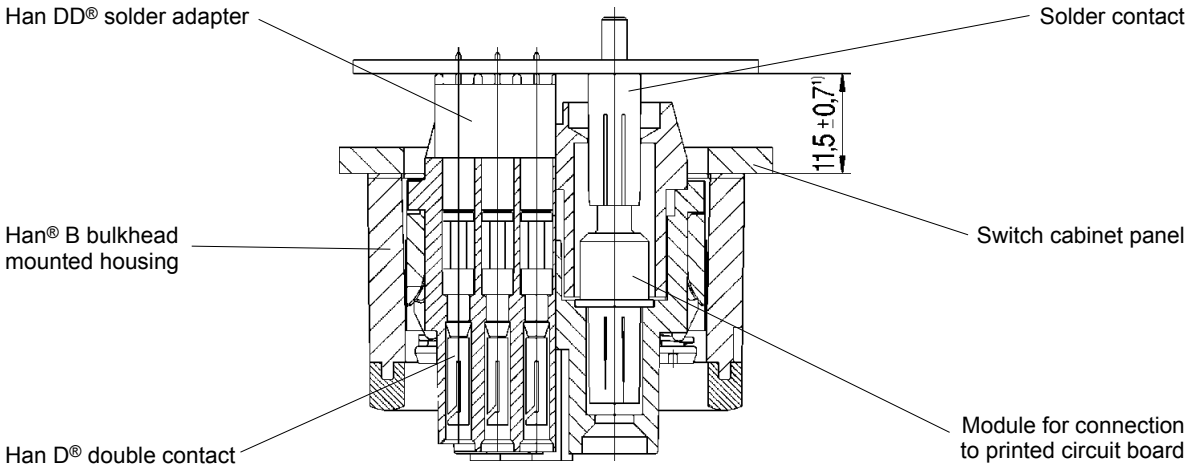
Recommended hole diameter: 3.2 mm




Han DD® module

Han® axial screw module 40 A

## Assembly situation




¹⁾ for Han® B EMC hoods/housings spacing of 12.5 ± 0.7 is necessary as no flange seal is used



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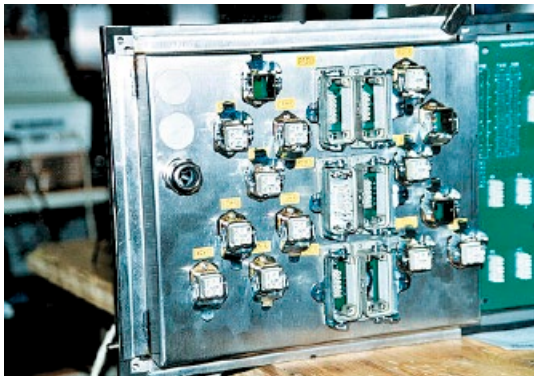
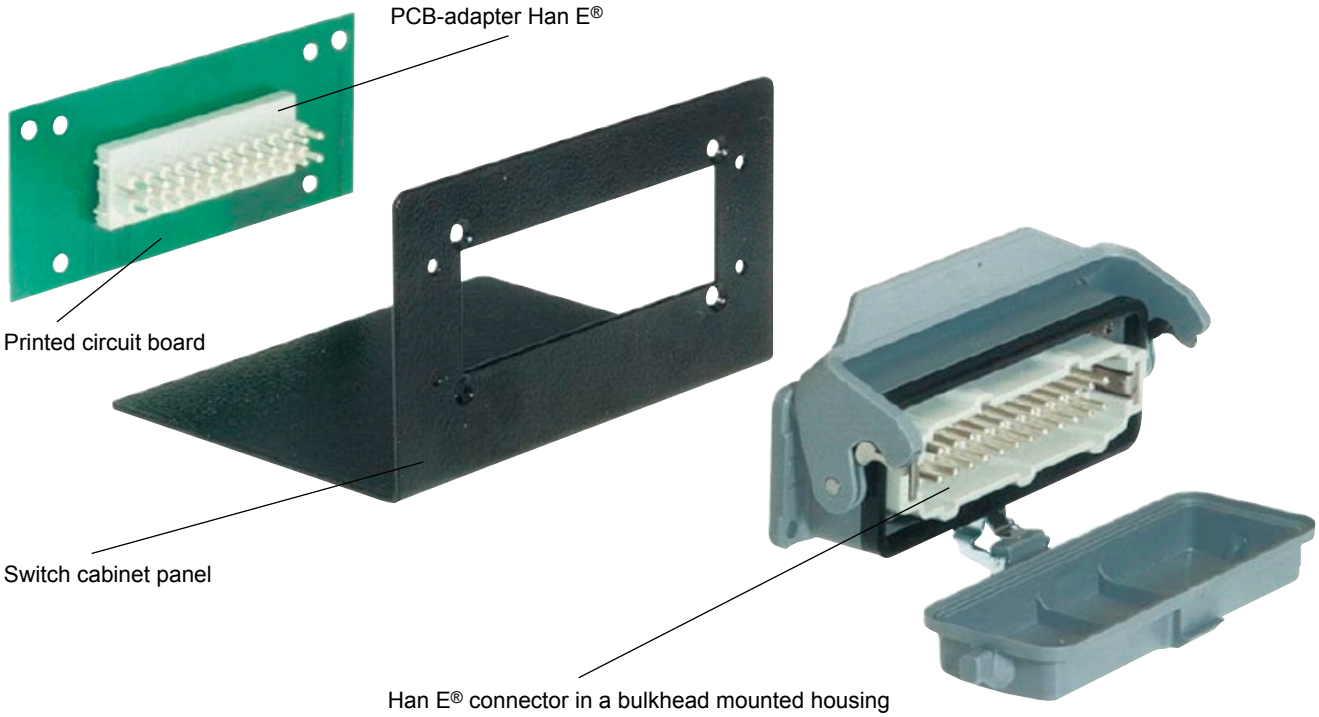
- Secondary mating between industrial connector and printed circuit board.
- No higher force is applied on the soldering joint when mating the industrial connector due to an additional mating point.
- No wiring between printed circuit board and industrial connector necessary.
- thus no wiring faults
  ⇨ no testing, no costs
- Connecting times are minimized.
- Easy handling is time and cost saving.
- The production of mechanical and electrical / electronical components can be completely separated.
- Possibility to reach a higher degree of automation in the production (i. e. wave soldering of the PCBs).



Han DD® and Han® Q 5/0 PCB-adapter
Wilhelm Fette GmbH, Germany

Han E® PCB-adapter



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# Notes





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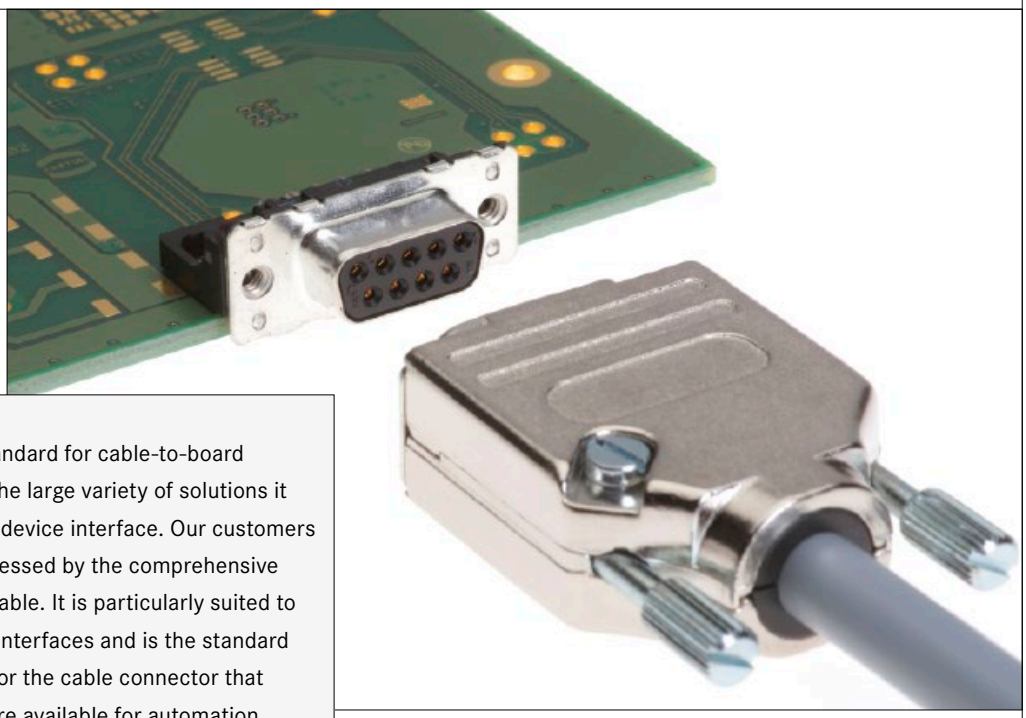
# 05. Subminiature D Connectors



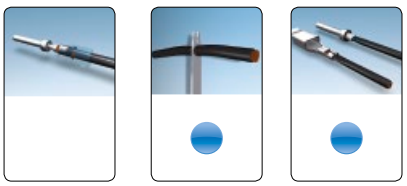
D-Sub connectors are an Industry Standard for cable-to-board connectivity applications. Thanks to the large variety of solutions it offers, it can be universally used as a device interface. Our customers manufacturing requirements are addressed by the comprehensive range of PCB termination styles available. It is particularly suited to configuring communication and data interfaces and is the standard for many fieldbus profiles. Solutions for the cable connector that can be easily assembled in the field are available for automation applications.

*Application profile:*

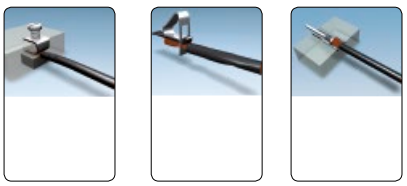
| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● |

**Cable termination**

*Han-Quick Lock®* | *IDC* | *Crimp*



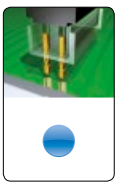
*Screw* | *Cage clamp* | *Axial screw*



**PCB termination**

*THT* | *SMC* | *SMT*

*Press-in*

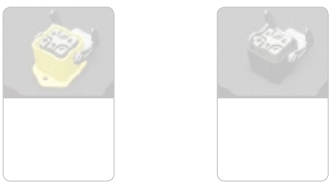


**Application standard**

PROFIBUS | DeviceNet | CANopen

**Housing integration**

*Separate housing* | *Integrated housing*



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## Contents


| | Page |
|---|---|
| D-Sub connector system – introduction | **05.02** |
| D-Sub Standard connectors (D-Sub – S) | **05.04** |
| D-Sub High Density connectors (D-Sub – HD) | **05.38** |
| D-Sub Mixed connectors (D-Sub – M) | **05.50** |
| D-Sub Filter connectors (D-Sub – F) | **05.90** |
| D-Sub Waterproof IP67 connectors (D-Sub – W) | **05.116** |
| D-Sub Housing range (D-Sub – H) and accessories | **05.140** |
| D-Sub Standard press-in connectors | **05.171** |
| D-Sub Standard SMC connectors | **05.176** |
| D-Sub Standard SMT connectors | **05.184** |
| Cables for insulation displacement termination and cable assemblies | **05.194** |






Tooling see chapter 20

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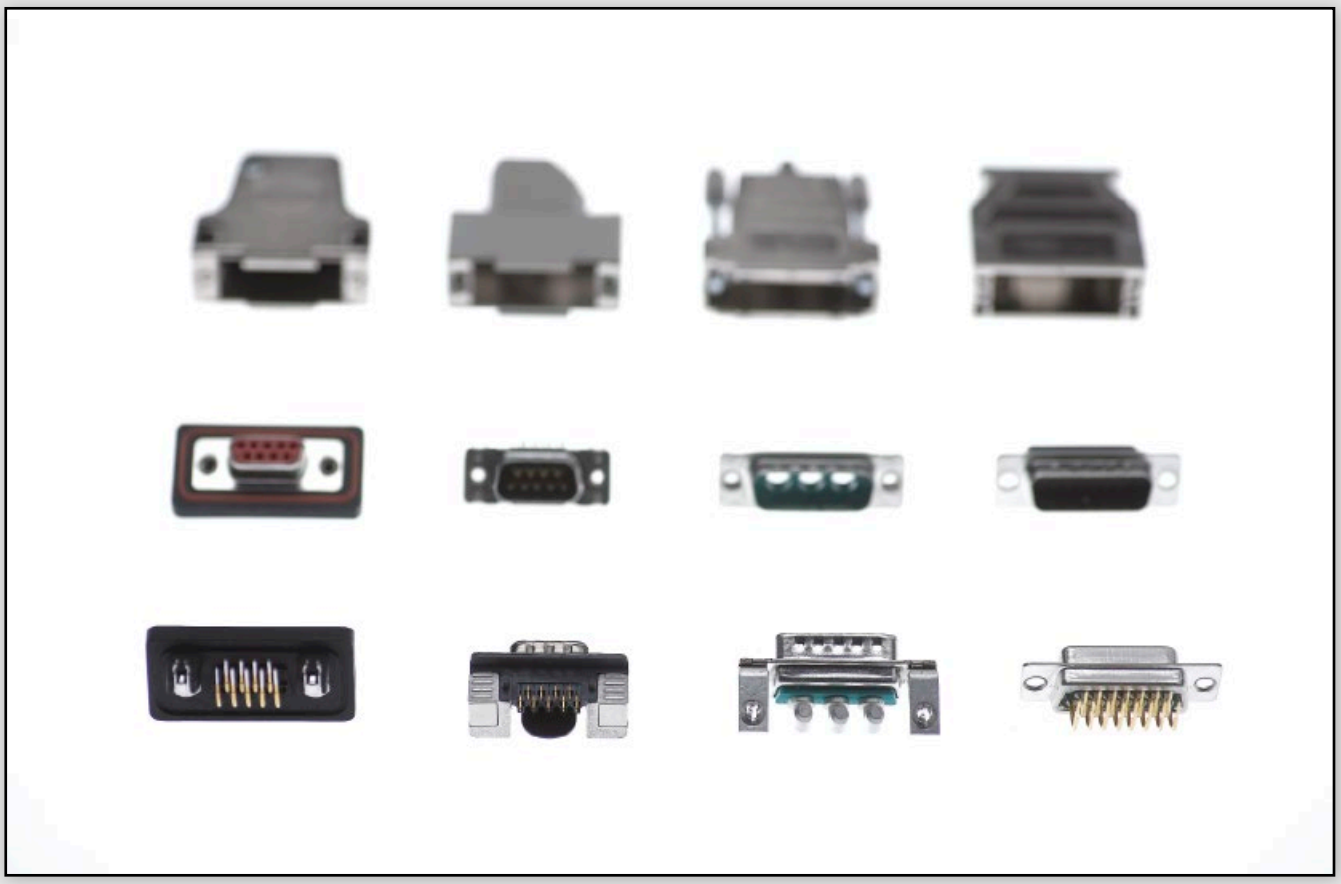
# 05. Subminiature D Connectors

In the automation industry, the Subminiature D connectors are the standard interfaces for data, signal and service/programmer interfaces. The extensive HARTING product range allows the set up of all Subminiature D interfaces common in the industry, such as for field buses (PROFIBUS, CanOpen and DeviceNet), while the connectors are also available in optional plastic and metal housings with IP20 and IP65 / IP 67 protection.
In addition to the comprehensive range of Standard connectors with 9 to 50 straight, right-angled or US foot print style contacts, HARTING offers other product ranges which extend the application field of Subminiature D connectors considerably.

Depending on the product family, various termination techniques can be supplied such as press-in, solder, SMC or SMT to match the customer's termination process.
In addition, a wide range of hoods and accessories complete the cable connector range to fulfil all kinds of requirements such as EMC, IP65 / IP67 etc.
For the cabling HARTING provides cable assemblies for standard applications like fieldbus, cable or customized solutions.







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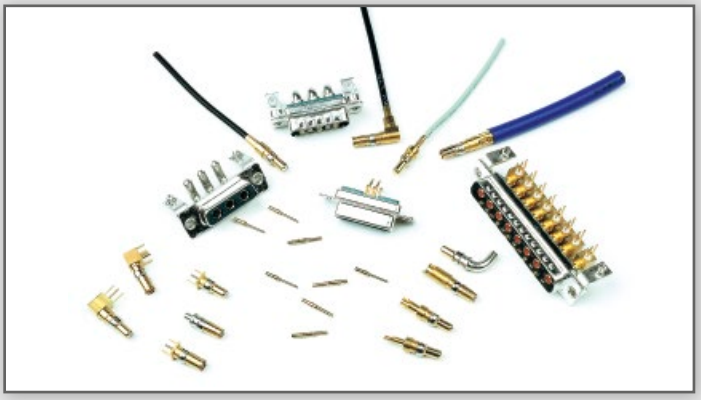
# Specific features of the product range

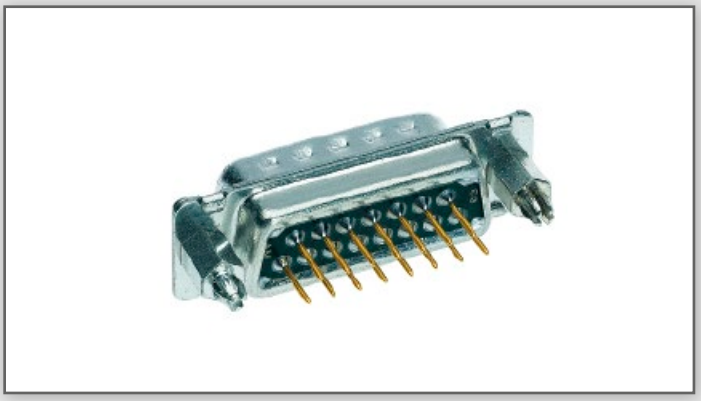


**D-SUB – MIXED CONNECTORS**
with nearly 20 different contact arrangements offering versatile options for mixing power, coaxial, high voltage, signal and even pneumatic contacts in one connector.

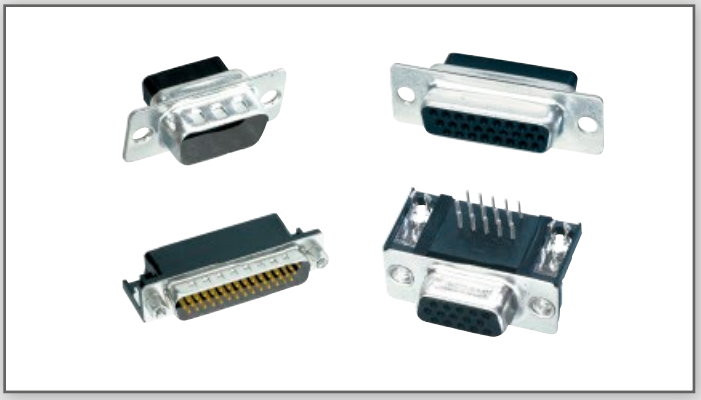


**D-SUB – WATERPROOF**
IP65 / IP67 connectors with 9 to 50 contacts for panel mount to PCB or cable.

**D-SUB – FILTER CONNECTORS**
with 9 to 37 contacts and integrated, different filter designs, like C, L or Pi types.



**D-SUB – HIGH DENSITY CONNECTORS**
with 15 to 78 straight and right-angled contacts, exceeding the contact capacity of the standard Subminiature D connectors by 70 %.





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| | |
|---|---|
| **Number of contacts** | 9, 15, 25, 37, 50<br>UL recognized |
| **Working current**<br>see current carrying capacity chart | |
| Turned contacts | 7.5 A max. |
| Stamped contacts | 6.5 A max. |
| **Test voltage $U_{r.m.s.}$** | 1 kV |
| **Clearance and creepage** | ≥ 1.0 mm |
| **Contact resistance** | ≤ 10 mΩ |
| **Insulation resistance** | ≥ $10^{10}$ Ω |
| **Temperature range** | -55 °C … +125 °C |
| The higher temperature limit includes the local ambient and heating effect of the contacts under load | |
| **Terminations** | a) Solder pins Ø 0.6 mm for P.C.B. holes Ø 0.8/1 mm<br>b) Solder pins, angled 90°<br>Ø 0.6 mm for P.C.B. holes<br>Ø 1 mm |
| **Materials** | |
| Mouldings and hoods | Thermoplastic resin, glass-fibre filled (PBTP), UL 94-V0 |
| Contacts | Copper alloy |
| **Contact surface** | |
| Contact zone | selectively plated according to performance level[1)] |
| Metal shell | Plated steel |

**Insertion and withdrawal force**

Connector on P.C.B.
Solder, straight with clips
– insertion max. per connector: 60 N
– withdrawal min. per connector: 10 N

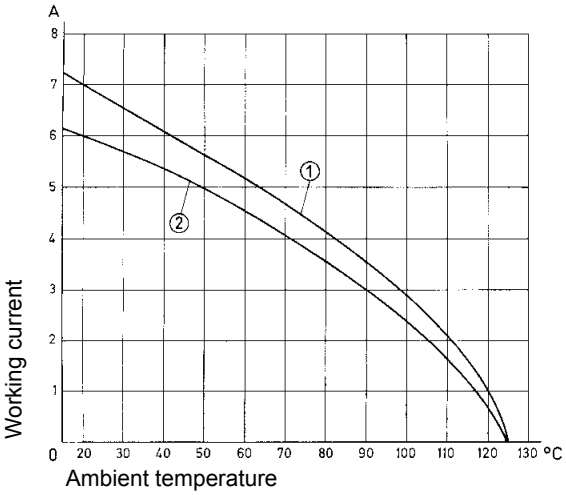
**Mating force**

| | |
|---|---|
| 9 way | ≤ 30 N |
| 15 way | ≤ 50 N |
| 25 way | ≤ 83 N |
| 37 way | ≤ 123 N |
| 50 way | ≤ 167 N |

## Current carrying capacity

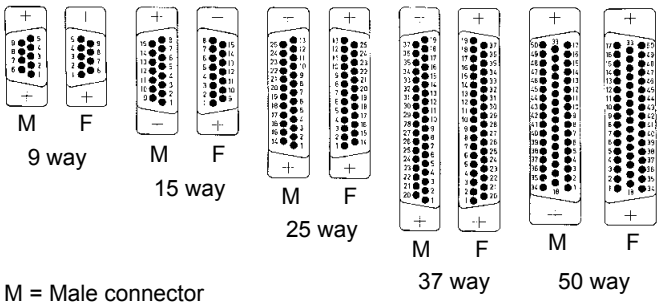
The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.
The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512.



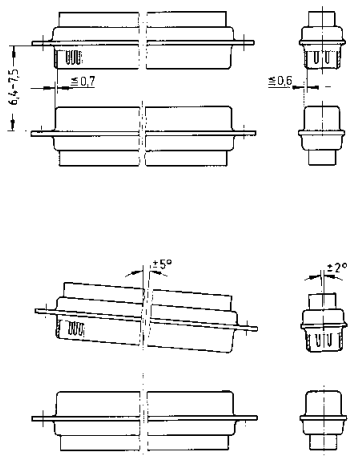

Example: 25 way connector
① Turned contacts
② Stamped contacts

## Contact arrangement View from termination side




M = Male connector
F = Female connector

## Mating conditions as per DIN 41 652




[1)] Performance level 3, 50 mating cycles, no gas test
Performance level 2 as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512
Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512



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# Notes





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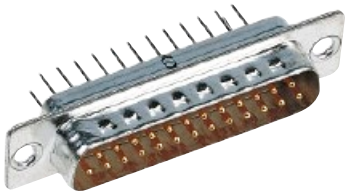
Number of contacts

# 9–50

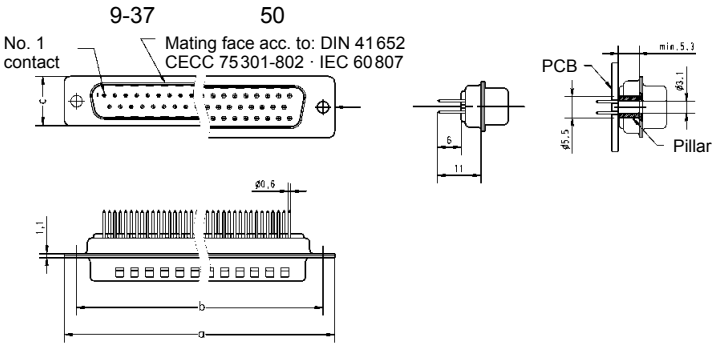


## Turned solder pins, straight

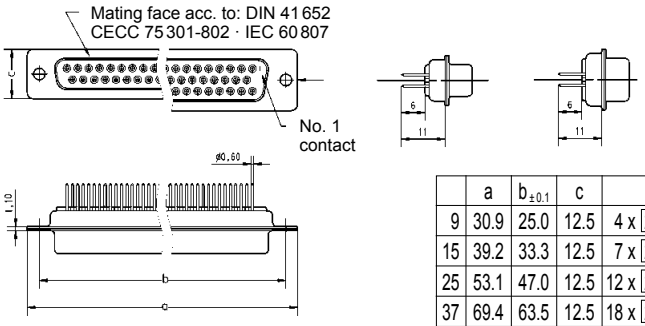


| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** Explanations see page 05.04 Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector** metal shell with dimples | 9 | 09 67 009 5654 | 09 67 009 5655 |
| | 15 | 09 67 015 5654 | 09 67 015 5655 |
| | 25 | 09 67 025 5654 | 09 67 025 5655 |
| | 37 | 09 67 037 5654 | 09 67 037 5655 |
| | 50 | 09 67 050 5654[1)] | 09 67 050 5655[1)] |
| **Female connector** metal shell | 9 | 09 67 009 4754 | 09 67 009 4755 |
| | 15 | 09 67 015 4754 | 09 67 015 4755 |
| | 25 | 09 67 025 4754 | 09 67 025 4755 |
| | 37 | 09 67 037 4754 | 09 67 037 4755 |
| | 50 | 09 67 050 4754[1)] | 09 67 050 4755[1)] |

**Male connector**

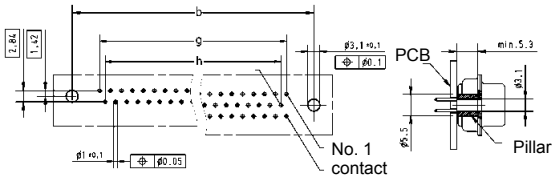



**Female connector**




| | a | $b_{\pm 0.1}$ | c | g | h |
|---|---|---|---|---|---|
| 9 | 30.9 | 25.0 | 12.5 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 |
| 15 | 39.2 | 33.3 | 12.5 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 |
| 25 | 53.1 | 47.0 | 12.5 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 |
| 37 | 69.4 | 63.5 | 12.5 | 18 x 2.76 = 49.68 | 17 x 2.76 = 46.92 |
| 50 | 67.0 | 61.1 | 15.4 | 16 x 2.76 = 44.16 | 15 x 2.76 = 41.40 |

**Board drillings**




Dimensions in mm

[1)] Not normally kept in stock

Mating conditions see page 05.04



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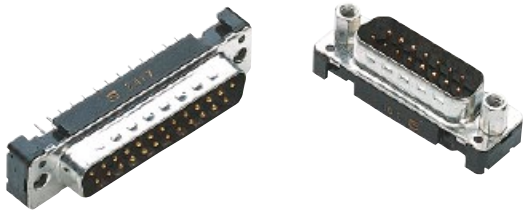
Number of contacts

# 9–50

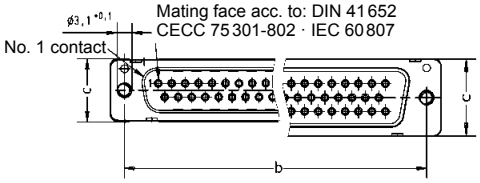


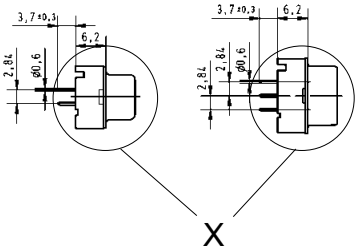
## Turned solder pins, straight without grounding-pins

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.04<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector**<br>metal shell with dimples<br>**available on request** | 9 | 09 66 121 770 . | 09 66 121 670 . |
| | 15 | 09 66 221 770 . | 09 66 221 670 . |
| | 25 | 09 66 321 770 . | 09 66 321 670 . |
| | 37 | 09 66 421 770 . | 09 66 421 670 . |
| | 50 | 09 66 521 770 . | 09 66 521 670 . |
| Please insert digit for flange thread or fitted female screw locks<br>M3 ▶ 1<br>4-40 UNC ▶ 2<br>fitted screw locks 4-40 UNC ▶ 3 | | | |

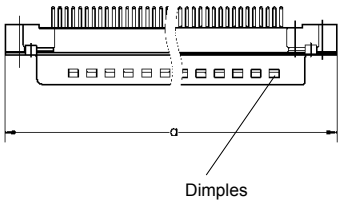
**Male connector**

9-37 50

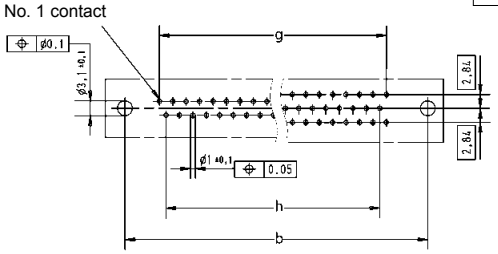


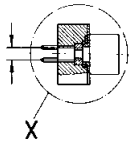

**Board drillings**



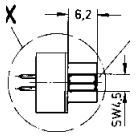

| | a | $b_{\pm 0.1}$ | c | g | h |
|---|---|---|---|---|---|
| 9 | 30.9 | 25.0 | 12.9 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 |
| 15 | 39.2 | 33.3 | 12.9 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 |
| 25 | 53.1 | 47.0 | 12.9 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 |
| 37 | 69.4 | 63.5 | 12.9 | 18 x 2.76 = 49.68 | 17 x 2.76 = 46.92 |
| 50 | 67.0 | 61.1 | 15.7 | 16 x 2.76 = 44.16 | 15 x 2.76 = 41.40 |




M3 or 4-40 UNC




fitted screw locks 4-40 UNC




Dimensions in mm



Mating conditions see page 05.04

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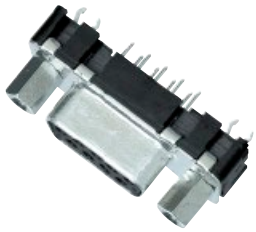
Number of contacts

# 9–50



## Stamped solder pins, straight with/without grounding board locks



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶ Explanations see page 05.04 Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector** metal shell with dimples | | | |
| Without grounding board locks | 9 | 09 65 121 770 . | 09 65 121 670 . |
| | 15 | 09 65 221 770 . | 09 65 221 670 . |
| | 25 | 09 65 321 770 . | 09 65 321 670 . |
| | 37 | 09 65 421 770 . | 09 65 421 670 . |
| With grounding board locks | 9 | 09 65 161 771 . | 09 65 161 671 . |
| | 15 | 09 65 261 771 . | 09 65 261 671 . |
| | 25 | 09 65 361 771 . | 09 65 361 671 . |
| | 37 | 09 65 461 771 . | 09 65 461 671 . |
| **Female connector** metal shell | | | |
| Without grounding board locks | 9 | 09 66 111 750 . | 09 66 111 650 . |
| | 15 | 09 66 211 750 . | 09 66 211 650 . |
| | 25 | 09 66 311 750 . | 09 66 311 650 . |
| | 37 | 09 66 411 750 . | 09 66 411 650 . |
| | 50 | 09 66 511 750 . | 09 66 511 650 . |
| With grounding board locks | 9 | 09 66 151 751 . | 09 66 151 651 . |
| | 15 | 09 66 251 751 . | 09 66 251 651 . |
| | 25 | 09 66 351 751 . | 09 66 351 651 . |
| | 37 | 09 66 451 751 . | 09 66 451 651 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 1 | | | |
| 4-40 UNC ▶ 2 | | | |
| fitted screw locks 4-40 UNC ▶ 3[1)] | | | |

[1)] Fitted screw locks 4-40 UNC not normally kept in stock for performance level 3

Connector dimensions see page 05.09. Mating conditions see page 05.04.



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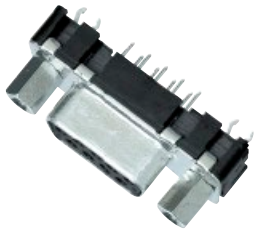
Number of contacts

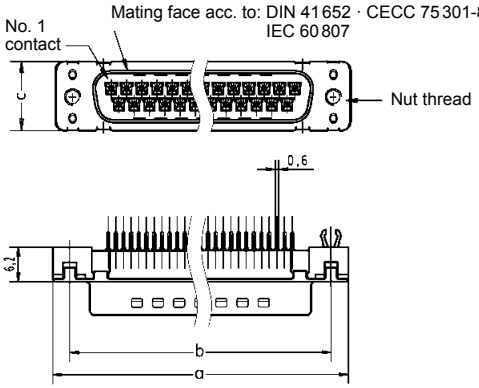
# 9–50

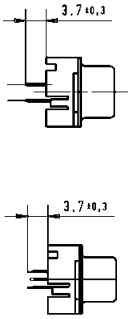


## Stamped solder pins, straight with/without grounding board locks

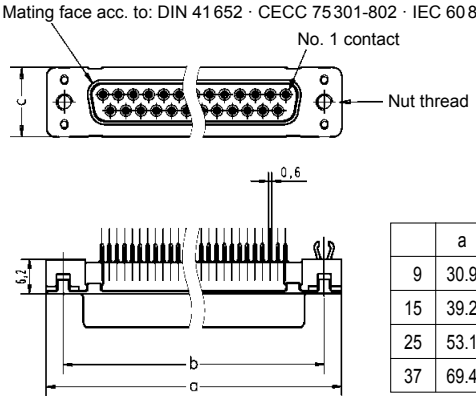
| Identification | Drawing | Dimensions in mm |
|---|---|---|

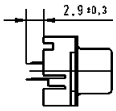
### Male connector
9 – 37 contacts



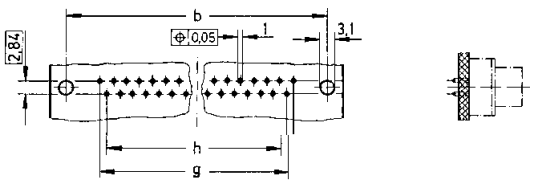

### Female connector
9 – 37 contacts




| | a | $b_{\pm 0.1}$ | c | g | h |
|---|---|---|---|---|---|
| 9 | 30.9 | 25.0 | 12.5 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 |
| 15 | 39.2 | 33.3 | 12.5 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 |
| 25 | 53.1 | 47.0 | 12.5 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 |
| 37 | 69.4 | 63.5 | 12.5 | 18 x 2.76 = 49.68 | 17 x 2.76 = 46.92 |

### Board drillings
9 – 37 contacts







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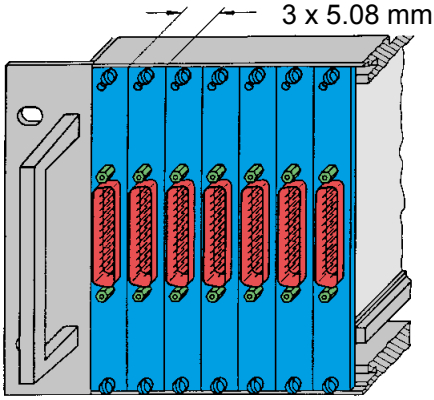
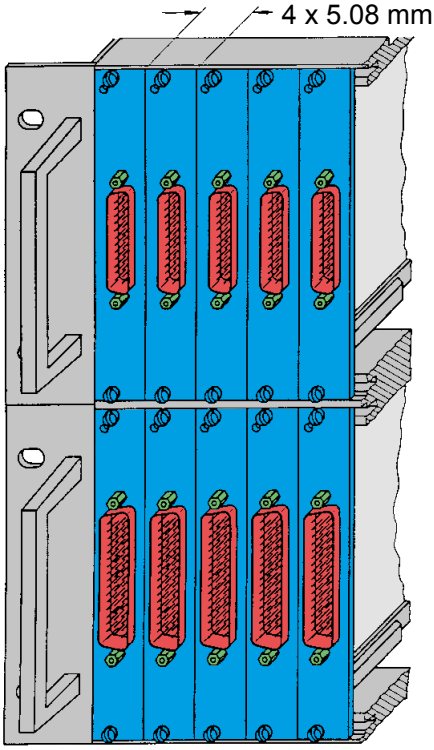
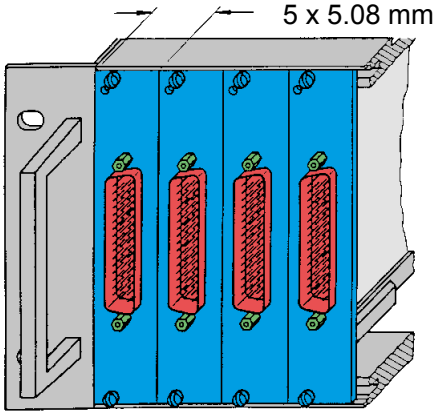
Front panel width 3 TE
3 x 5.08 mm



Front panel width 4 TE
4 x 5.08 mm



Front panel width 5 TE
5 x 5.08 mm



Low-Profile Versions
pages 05.18 – 05.21

3,6
9-37 way

6,2
50 way

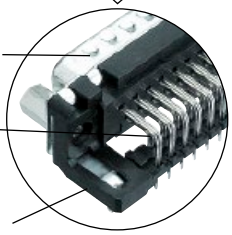
Standard Versions
pages 05.12 – 05.17

7,3
9-37 way

8,7
50 way

U.S. Footprint Versions
pages 05.22 – 05.23

6,3
9-37 way



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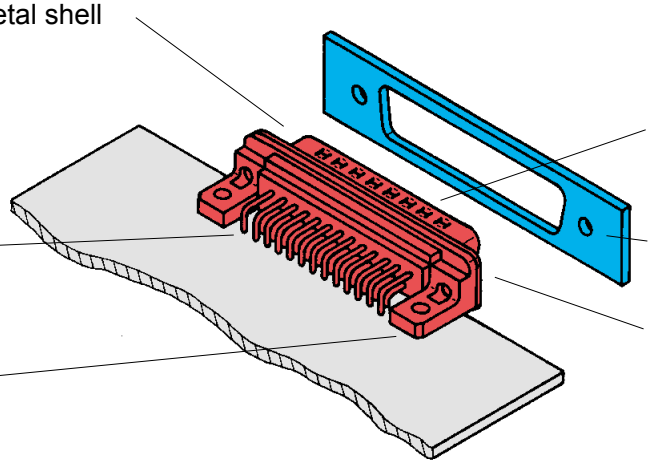
## Advantages

All-round protective metal shell
- Polarisation
- Contact protection
- Plated shell
- Male connector with dimples

Plated terminations for increased solderability

Grounding contact riveted to metal shell

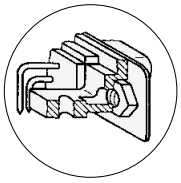
Integrated plastic mounting bracket



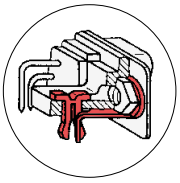
Contact surface finish to different performance levels

Panel

Different metal threads possible in flange area
- M3
- 4-40 UNC
- fitted female screw locks 4-40 UNC
- max. torque ≤ 0.8 Nm



Mounting bracket



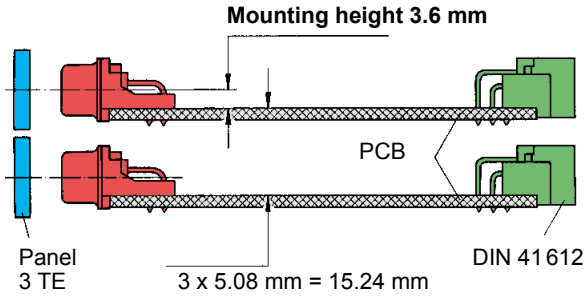
Mounting bracket with snap-in-clips and grounding pin

## Mounting height

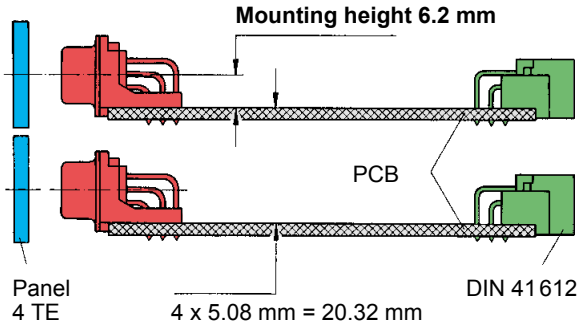
### Low-Profile Versions

The reduced mounting height of these connectors allow them to be used on the same PCB as DIN 41612 types with no loss of packaging density when card frames to DIN 41494 are used.

9-37 way connectors with 3.6 mm mounting height can be fitted to front panels of 3 TE (15.24 mm) width.

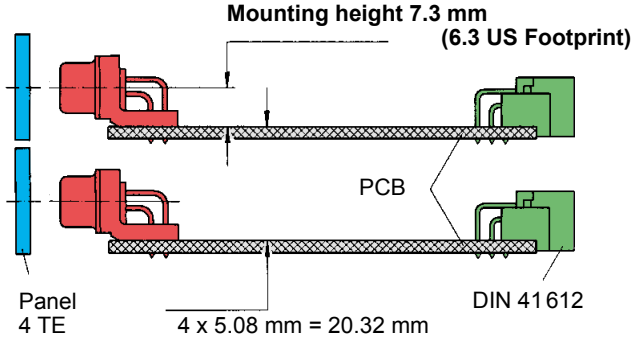



50 way connectors with 6.2 mm mounting height can be fitted to front panels of 4 TE (20.32 mm) width.

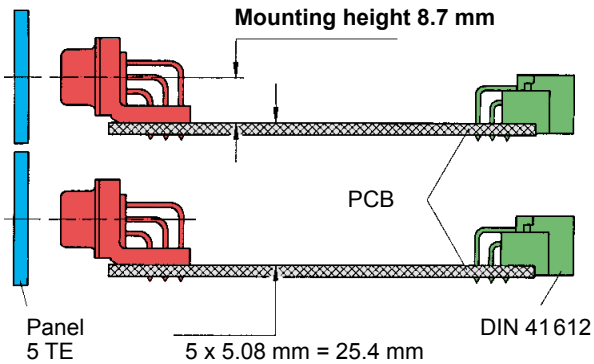



### Standard Versions US Footprint

9-37 way connectors with 7.3 mm mounting height can be fitted to front panels of 4 TE (20.32 mm) width.




50 way connectors with 8.7 mm mounting height can be fitted to front panels of 5 TE (25.4 mm) width.





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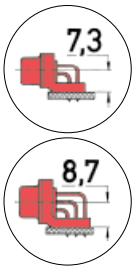
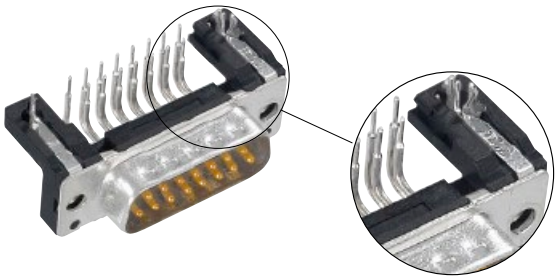
Number of contacts

# 9–37
# 50

Mounting height

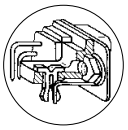
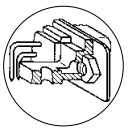


Standard Versions

Turned solder pins, angled with/without snap-in-clips and grounding board locks

D-Sub

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** Explanations see page 05.04 Other performance levels on request ▶ | | Performance level 3 | Performance level 2 |
| **Male connector** metal shell with dimples | | 2.84 mm pitch | 2.84 mm pitch |
| With snap-in clips and grounding board locks | 9 | 09 66 163 781 . | 09 66 163 681 . |
| | 15 | 09 66 263 781 . | 09 66 263 681 . |
| | 25 | 09 66 363 781 . | 09 66 363 681 . |
| | 37 | 09 66 463 781 . | 09 66 463 681 . |
| | 50 | 09 66 563 781 . | 09 66 563 681 . |
|  | | 2.54 mm pitch | 2.54 mm pitch |
| available on request | 9 | 09 66 162 781 . | 09 66 162 681 . |
| | 15 | 09 66 262 781 . | 09 66 262 681 . |
| | 25 | 09 66 362 781 . | 09 66 362 681 . |
| | 37 | 09 66 462 781 . | 09 66 462 681 . |
| | 50 | 09 66 562 781 . | 09 66 562 681 . |
| | | 2.84 mm pitch | 2.84 mm pitch |
| Without snap-in clips and grounding board locks | 9 | 09 66 123 780 . | 09 66 123 680 . |
| | 15 | 09 66 223 780 . | 09 66 223 680 . |
| | 25 | 09 66 323 780 . | 09 66 323 680 . |
| | 37 | 09 66 423 780 . | 09 66 423 680 . |
| | 50 | 09 66 523 780 . | 09 66 523 680 . |
|  | | 2.54 mm pitch | 2.54 mm pitch |
| available on request | 9 | 09 66 122 780 . | 09 66 122 680 . |
| | 15 | 09 66 222 780 . | 09 66 222 680 . |
| | 25 | 09 66 322 780 . | 09 66 322 680 . |
| | 37 | 09 66 422 780 . | 09 66 422 680 . |
| | 50 | 09 66 522 780 . | 09 66 522 680 . |

Please insert digit for flange thread or fitted female screw locks

| | |
|---|---|
| M3 ▶ | 1 |
| 4-40 UNC ▶ | 2 |
| fitted screw locks 4-40 UNC ▶ | 3 |

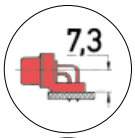


Downloaded from Arrow.com.

Number of contacts

# 9–37
# 50

Mounting height



Standard Versions

Turned solder pins, angled with/without snap-in-clips and grounding board locks

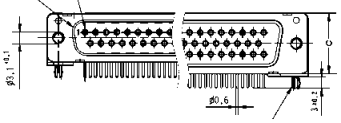
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

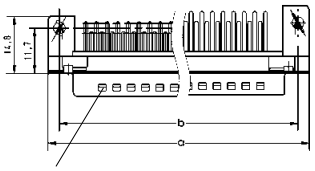
With snap-in clips
and grounding board locks

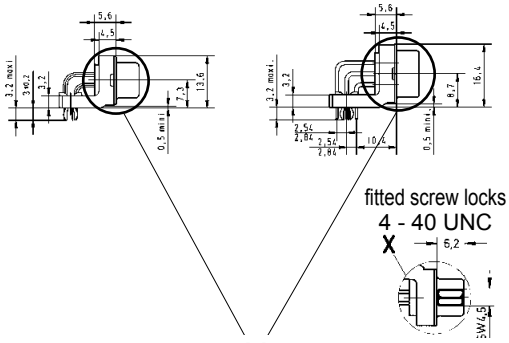
9-37 50

Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807
No. 1 contact



Grounding pins 0.2 x 0.6

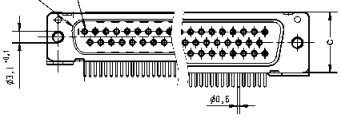


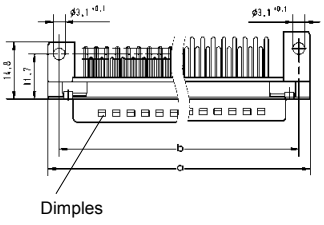



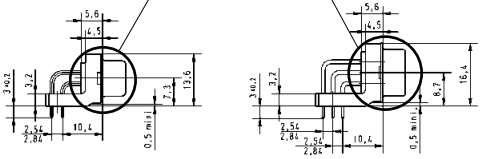

Without snap-in clips
and grounding board locks

9-37 50

Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807
No. 1 contact

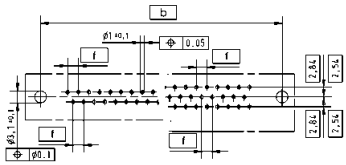




## Board drillings

9-37 50



| | a | $b_{\pm 0.1}$ | c | f |
|---|---|---|---|---|
| 9 | 30.90 | 25.00 | 12.90 | 2.74 |
| 15 | 39.20 | 33.30 | 12.90 | 2.74 |
| 25 | 53.10 | 47.00 | 12.90 | 2.76 |
| 37 | 69.40 | 63.50 | 12.90 | 2.76 |
| 50 | 67.00 | 61.10 | 15.70 | 2.76 |





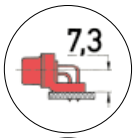
Mating conditions see page 05.04
Mounting details see page 05.24

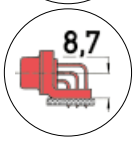
Downloaded from Arrow.com.

Number of contacts

# 9–37
# 50

Mounting height



Standard Versions

Stamped solder pins, angled with grounding board locks



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.04<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector**<br>metal shell with dimples | | | |
| | | 2.84 mm pitch | 2.84 mm pitch |
| | 9 | 09 65 163 781 . [1] | 09 65 163 681 . [1] |
| | 15 | 09 65 263 781 . [1] | 09 65 263 681 . [1] |
| | 25 | 09 65 363 781 . [1] | 09 65 363 681 . [1] |
| | 37 | 09 65 463 781 . [1] | 09 65 463 681 . [1] |
| | | 2.54 mm pitch | 2.54 mm pitch |
| | 9 | 09 65 162 781 . | 09 65 162 681 . |
| | 15 | 09 65 262 781 . | 09 65 262 681 . |
| | 25 | 09 65 362 781 . | 09 65 362 681 . |
| | 37 | 09 65 462 781 . | 09 65 462 681 . |
| **Female connector**<br>metal shell | | | |
| | | 2.84 mm pitch | 2.84 mm pitch |
| | 9 | 09 66 153 761 . [1] | 09 66 153 661 . [1] |
| | 15 | 09 66 253 761 . [1] | 09 66 253 661 . [1] |
| | 25 | 09 66 353 761 . [1] | 09 66 353 661 . [1] |
| | 37 | 09 66 453 761 . [1] | 09 66 453 661 . [1] |
| | | 2.54 mm pitch | 2.54 mm pitch |
| | 9 | 09 66 152 761 . | 09 66 152 661 . |
| | 15 | 09 66 252 761 . | 09 66 252 661 . |
| | 25 | 09 66 352 761 . | 09 66 352 661 . |
| | 37 | 09 66 452 761 . | 09 66 452 661 . |
| | 50 | 09 66 552 761 . [1] | 09 66 552 661 . [1] |
| Please insert digit for flange thread or fitted female screw locks | | | |
| Ø 3.1 mm hole ▶ 0[1] | | | |
| M3 ▶ 1 | | | |
| 4-40 UNC ▶ 2 | | | |
| fitted screw locks 4-40 UNC ▶ 3 | | | |

[1] Not normally kept in stock



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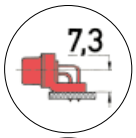
Number of contacts

# 9–37
# 50

Mounting height

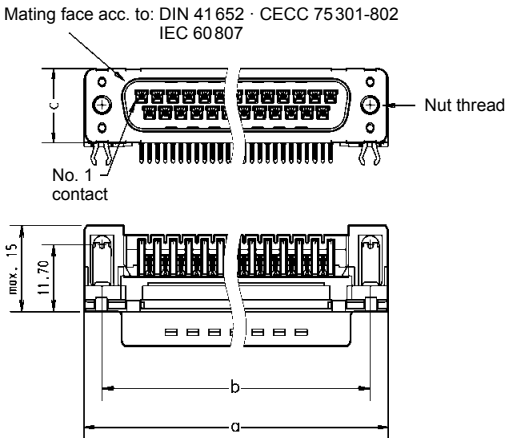


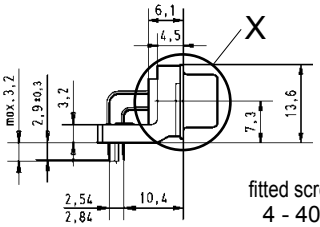
Standard Versions

Stamped solder pins, angled with grounding board locks

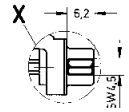
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

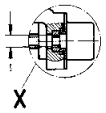



fitted screw locks
4 - 40 UNC

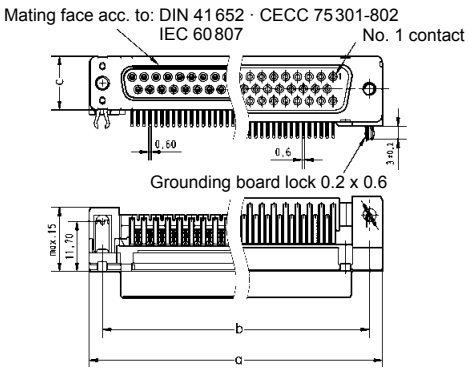


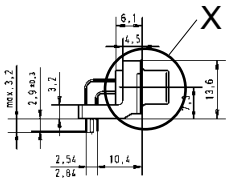

M3 or
4 - 40 UNC



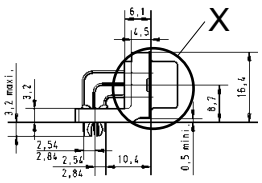

## Female connector

9-37 50



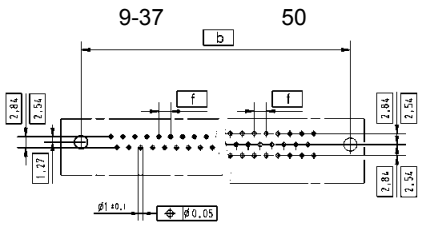

9-37




50

## Board drillings

9-37 50




| | a | $b_{\pm 0.1}$ | c | f |
|---|---|---|---|---|
| 9 | 30.90 | 25.00 | 12.50 | 2.74 |
| 15 | 39.20 | 33.30 | 12.50 | 2.74 |
| 25 | 53.10 | 47.00 | 12.50 | 2.76 |
| 37 | 69.40 | 63.50 | 12.50 | 2.76 |
| 50 | 67.00 | 61.10 | 15.40 | 2.76 |





Mating conditions see page 05.04
Mounting details see page 05.24

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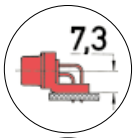
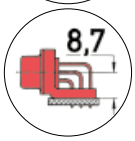
Number of contacts

# 9–37
# 50

Mounting height

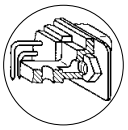
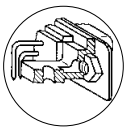



Standard Versions

Stamped solder pins, angled without grounding board locks



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.04<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector**<br>metal shell with dimples | | | |
| | | 2.84 mm pitch | 2.84 mm pitch |
|  | 9 | 09 65 123 780 . [1)] | 09 65 123 680 . [1)] |
| | 15 | 09 65 223 780 . [1)] | 09 65 223 680 . [1)] |
| | 25 | 09 65 323 780 . [1)] | 09 65 323 680 . [1)] |
| | 37 | 09 65 423 780 . [1)] | 09 65 423 680 . [1)] |
| | | 2.54 mm pitch | 2.54 mm pitch |
| | 9 | 09 65 122 780 . | 09 65 122 680 . |
| | 15 | 09 65 222 780 . | 09 65 222 680 . |
| | 25 | 09 65 322 780 . | 09 65 322 680 . |
| | 37 | 09 65 422 780 . | 09 65 422 680 . |
| **Female connector**<br>metal shell | | | |
| | | 2.84 mm pitch | 2.84 mm pitch |
|  | 9 | 09 66 113 760 . [1)] | 09 66 113 660 . [1)] |
| | 15 | 09 66 213 760 . [1)] | 09 66 213 660 . [1)] |
| | 25 | 09 66 313 760 . [1)] | 09 66 313 660 . [1)] |
| | 37 | 09 66 413 760 . [1)] | 09 66 413 660 . [1)] |
| | | 2.54 mm pitch | 2.54 mm pitch |
| | 9 | 09 66 112 760 . | 09 66 112 660 . |
| | 15 | 09 66 212 760 . | 09 66 212 660 . |
| | 25 | 09 66 312 760 . | 09 66 312 660 . |
| | 37 | 09 66 412 760 . | 09 66 412 660 . |
| | 50 | 09 66 512 760 . [1)] | 09 66 512 660 . [1)] |

Please insert digit for flange thread or fitted female screw locks

| | |
|---|---|
| Ø 3.1 mm hole ▶ | 0[1)] |
| M3 ▶ | 1 |
| 4-40 UNC ▶ | 2 |
| fitted screw locks 4-40 UNC ▶ | 3 |

[1)] Not normally kept in stock

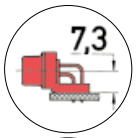


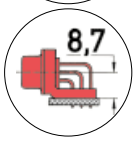
Downloaded from Arrow.com.

Number of contacts

# 9–37
# 50

Mounting height




Standard Versions

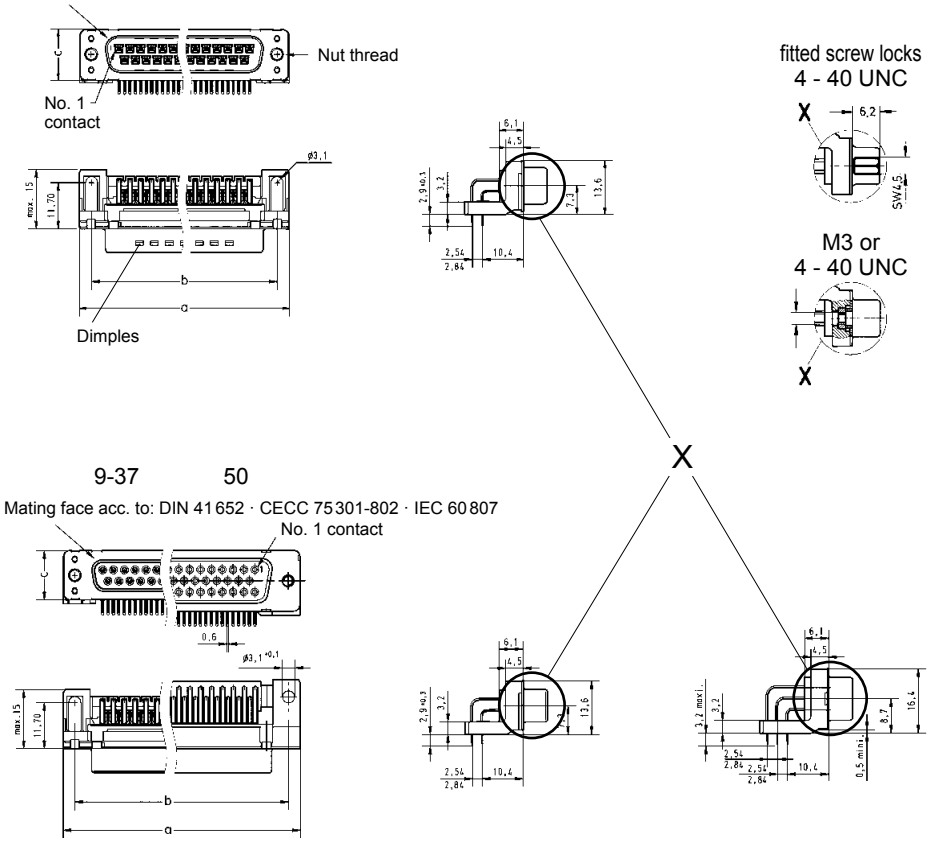
Stamped solder pins, angled without grounding board locks

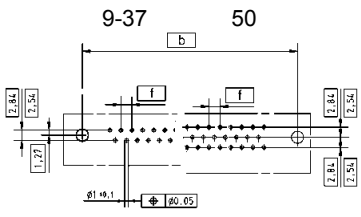
| Identification | Drawing | Dimensions in mm |
|---|---|---|

Male connector

Female connector

Board drillings




| | a | $b_{\pm 0.1}$ | c | f |
|---|---|---|---|---|
| 9 | 30.90 | 25.00 | 12.50 | 2.74 |
| 15 | 39.20 | 33.30 | 12.50 | 2.74 |
| 25 | 53.10 | 47.00 | 12.50 | 2.76 |
| 37 | 69.40 | 63.50 | 12.50 | 2.76 |
| 50 | 67.00 | 61.10 | 15.40 | 2.76 |

Mating conditions see page 05.04
Mounting details see page 05.24

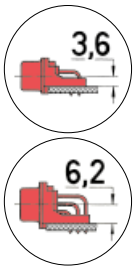


Downloaded from Arrow.com.

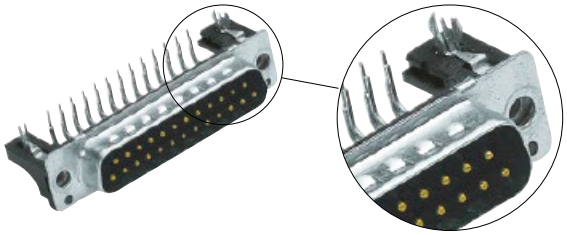
Number of contacts

# 9–37
# 50

Mounting height

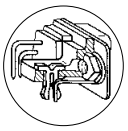



Low-Profile Versions



Turned solder pins, angled with snap-in-clips and grounding board locks



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** Explanations see page 05.04 Other performance levels on request ▶ | | Performance level 3 | Performance level 2 |
| **Male connector** metal shell with dimples | | 2.54 mm pitch | 2.54 mm pitch |
|  | 9 | 09 66 162 781 . | 09 66 162 681 . |
| | 15 | 09 66 262 781 . | 09 66 262 681 . |
| | 25 | 09 66 362 781 . | 09 66 362 681 . |
| | 37 | 09 66 462 781 . | 09 66 462 681 . |
| | 50 | 09 66 562 781 . | 09 66 562 681 . |

available on request

Please insert digit for flange thread or fitted female screw locks

| | |
|---|---|
| M3 ▶ | 5 |
| 4-40 UNC ▶ | 6 |
| fitted screw locks 4-40 UNC ▶ | 7 |

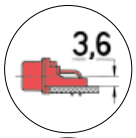


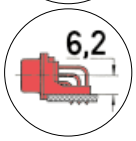
Downloaded from Arrow.com.

Number of contacts

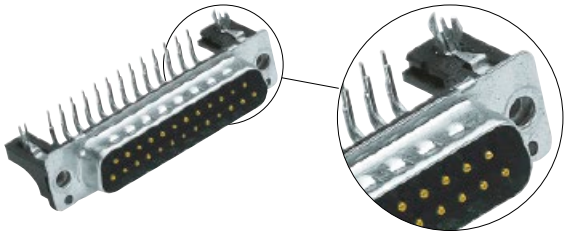
# 9–37
# 50

Mounting height




Low-Profile Versions



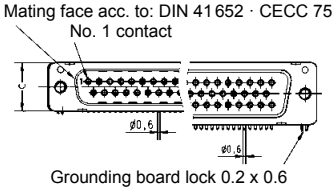
Turned solder pins, angled with snap-in-clips and grounding board locks

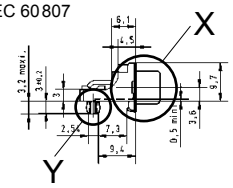
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

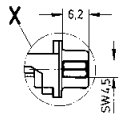
9-37 50

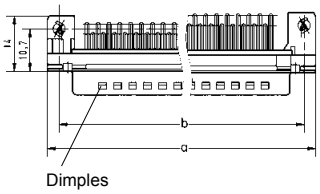
Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807

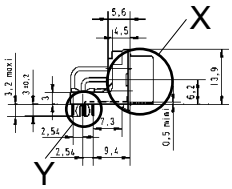


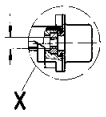

fitted screw locks
4 - 40 UNC



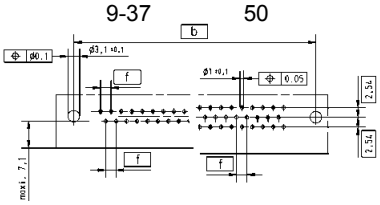



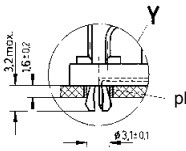

M3 or
4 - 40 UNC




## Board drillings

9-37 50






plated through holes

| | a | $b_{\pm 0.1}$ | c | f |
|---|---|---|---|---|
| 9 | 30.90 | 25.00 | 12.50 | 2.74 |
| 15 | 39.20 | 33.30 | 12.50 | 2.74 |
| 25 | 53.10 | 47.00 | 12.50 | 2.76 |
| 37 | 69.40 | 63.50 | 12.50 | 2.76 |
| 50 | 67.00 | 61.10 | 15.70 | 2.76 |



Mating conditions see page 05.04
Mounting details see page 05.24

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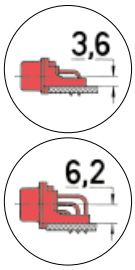
Number of contacts

# 9–37
# 50

Mounting height




Low-Profile Versions

Stamped solder pins, angled with grounding board locks



| Identification | No. of contacts | Part number | | Part number | |
|---|---|---|---|---|---|
| **Performance levels** Explanations see page 05.04 Other contact surfaces on request ▶ | | Performance level 3 | | Performance level 2 | |
| **Male connector** metal shell with dimples | | | | | |
| | 9 | 09 65 162 781 . | | 09 65 162 681 . | |
| | 15 | 09 65 262 781 . | | 09 65 262 681 . | |
| | 25 | 09 65 362 781 . | | 09 65 362 681 . | |
| | 37 | 09 65 462 781 . | | 09 65 462 681 . | |
| **Female connector** metal shell | | | | | |
| | 9 | 09 66 152 761 . | | 09 66 152 661 . | |
| | 15 | 09 66 252 761 . | | 09 66 252 661 . | |
| | 25 | 09 66 352 761 . | | 09 66 352 661 . | |
| | 37 | 09 66 452 761 . | | 09 66 452 661 . | |
| | 50 | 09 66 552 761 . | 1) | 09 66 552 661 . | 1) |
| Please insert digit for flange thread or fitted female screw locks | | | | | |
| M3 ▶ 5 | | | | | |
| 4-40 UNC ▶ 6 | | | | | |
| fitted screw locks 4-40 UNC ▶ 7 | | | | | |

1) Not normally kept in stock

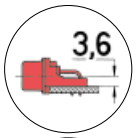


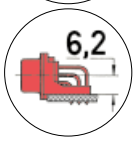
Downloaded from Arrow.com.

Number of contacts

# 9–37
# 50

Mounting height



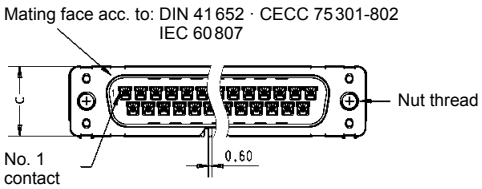



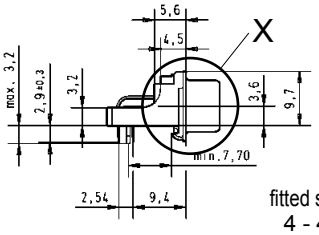

Low-Profile Versions

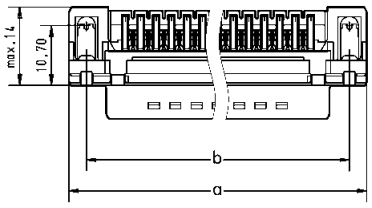
Stamped solder pins, angled with grounding board locks

| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

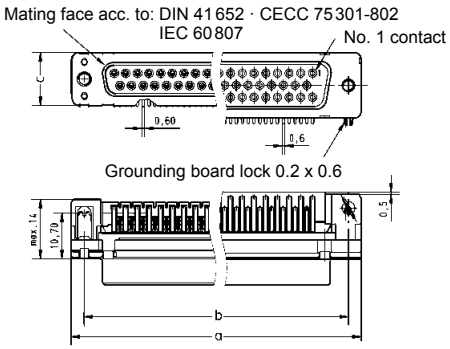


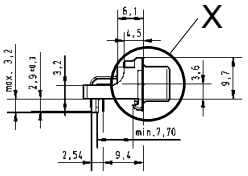



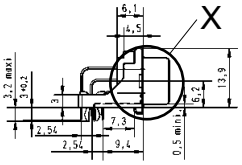

9-37 50

## Female connector



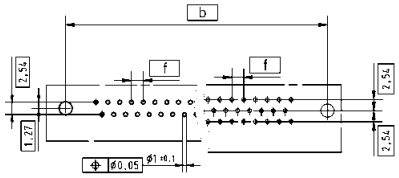

9-37




50

## Board drillings

9-37 50




| | a | $b_{\pm 0.1}$ | c | f |
|---|---|---|---|---|
| 9 | 30.90 | 25.00 | 12.50 | 2.74 |
| 15 | 39.20 | 33.30 | 12.50 | 2.74 |
| 25 | 53.10 | 47.00 | 12.50 | 2.76 |
| 37 | 69.40 | 63.50 | 12.50 | 2.76 |
| 50 | 67.00 | 61.10 | 15.40 | 2.76 |



Mating conditions see page 05.04
Mounting details see page 05.24

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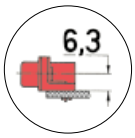
U.S. Footprint

Number of contacts

# 9–37

Mounting height



Stamped solder pins, angled with snap-in-clips and grounding board locks

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.04<br>Other performance levels on request | | Performance level 3 | S4[1] |
| **Male connector**<br>metal shell with dimples | | 2.84 mm pitch | 2.84 mm pitch |
| | 9 | 09 68 163 781 . | 09 68 163 581 . |
| | 15 | 09 68 263 781 . | 09 68 263 581 . |
| | 25 | 09 68 363 781 . | 09 68 363 581 . |
| | 37 | 09 68 463 781 . | 09 68 463 581 . |
| **Female connector**<br>metal shell | | 2.84 mm pitch | 2.84 mm pitch |
| | 9 | 09 68 153 761 . | 09 68 153 561 . |
| | 15 | 09 68 253 761 . | 09 68 253 561 . |
| | 25 | 09 68 353 761 . | 09 68 353 561 . |
| | 37 | 09 68 453 761 . | 09 68 453 561 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 1[2] | | | |
| 4-40 UNC ▶ 2 | | | |
| fitted screw locks 4-40 UNC ▶ 3 | | | |

[1] S4 = 0.76 µm (30 µinch) Au or PdNi equivalent
[2] Not normally kept in stock



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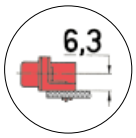
U.S. Footprint

Number of contacts

# 9–37

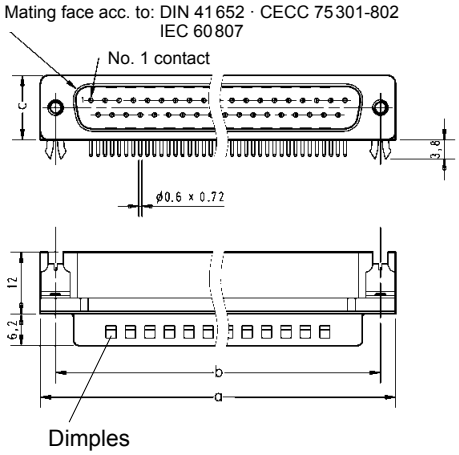
Mounting height

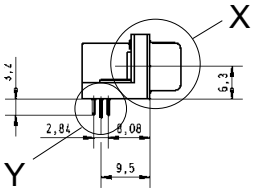


Stamped solder pins, angled with snap-in-clips and grounding board locks

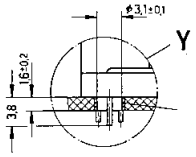
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

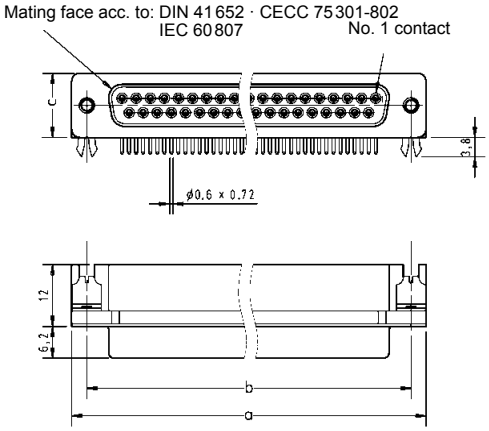


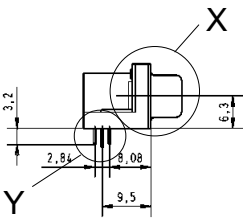




plated through holes



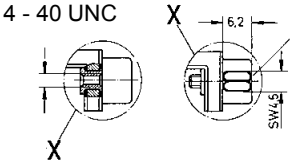

## Female connector



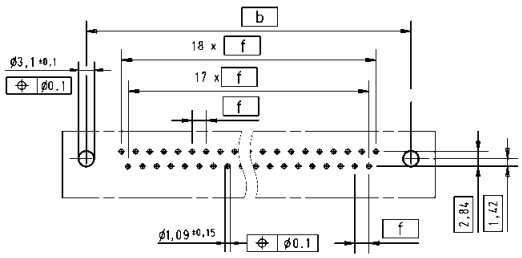




fitted screw locks
4 - 40 UNC

M3 or
4 - 40 UNC




## Board drillings




| | a | $b_{\pm 0.1}$ | c | f |
|---|---|---|---|---|
| 9 | 30.90 | 25.00 | 12.55 | 2.77 |
| 15 | 39.20 | 33.30 | 12.55 | 2.77 |
| 25 | 53.10 | 47.00 | 12.55 | 2.77 |
| 37 | 69.40 | 63.50 | 12.55 | 2.77 |





Mating conditions see page 05.04
Mounting details see page 05.24

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| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Standard Versions

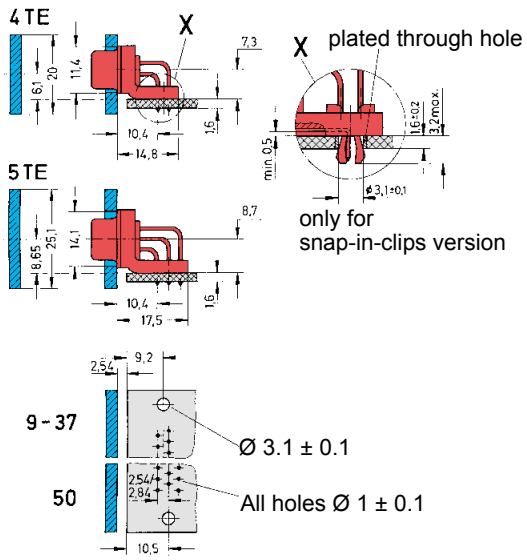
### Mounting height 7.3 mm

9-37 way
for front panel
4 units of width (TE)

### Mounting height 8.7 mm

50 way
for front panel
5 units of width (TE)

for connectors see pages 05.12 – 05.17




## Low-Profile Versions

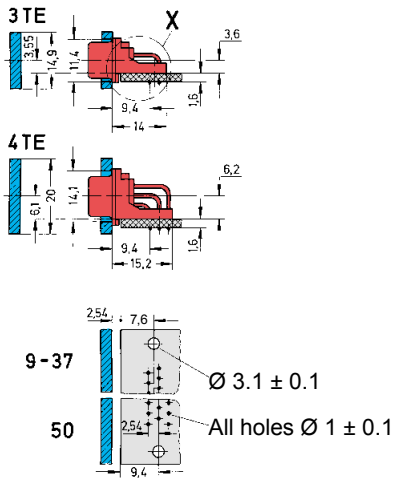
### Mounting height 3.6 mm

9-37 way
for front panel
3 units of width (TE)

### Mounting height 6.2 mm

50 way
for front panel
4 units of width (TE)

for connectors see pages 05.18 – 05.21



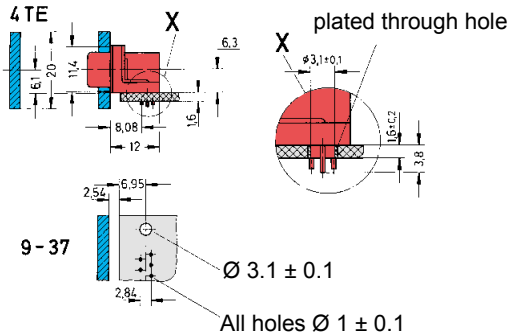

When used in a wave soldering process the mating face of the connector must be protected with adhesive tape.

## U.S. Footprint Versions

### Mounting height 6.3 mm

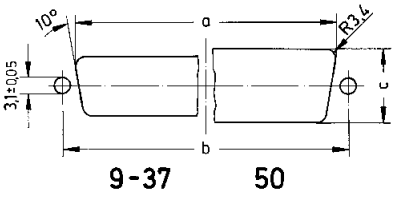
9-37 way
for front panel
4 units of width (TE)

for connectors see pages 05.22 – 05.23




### Panel cut out for front/rear mount

Values are taken from the CECC 75301-802




Front mount

| | $a_{\pm 0.2}$ | $b_{\pm 0.13}$ | $c_{\pm 0.2}$ |
|---|---|---|---|
| 9 | 22.2 | 25.0 | 12.3 |
| 15 | 30.5 | 33.3 | 12.3 |
| 25 | 44.3 | 47.0 | 12.3 |
| 37 | 60.7 | 63.5 | 12.3 |
| 50 | 58.3 | 61.1 | 15.1 |

Rear mount

| | $a_{\pm 0.2}$ | $b_{\pm 0.13}$ | $c_{\pm 0.2}$ |
|---|---|---|---|
| 9 | 20.5 | 25.0 | 11.4 |
| 15 | 28.8 | 33.3 | 11.4 |
| 25 | 42.5 | 47.0 | 11.4 |
| 37 | 59.1 | 63.5 | 11.4 |
| 50 | 56.3 | 61.1 | 14.1 |



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| | |
|---|---|
| **Number of contacts** | 9, 15, 25, 37, 50<br>UL recognized |
| **Working current**<br>see current carrying capacity chart | |
| Turned contacts | 7.5 A max. |
| Stamped contacts | 6.5 A max. |
| Insulation displacement | 2 A max. |
| **Test voltage $U_{r.m.s.}$** | 1 kV |
| **Clearance and creepage** | ≥ 1.0 mm<br>≥ 0.7 mm (insulation displacement) |
| **Contact resistance** | ≤ 10 mΩ |
| **Insulation resistance** | ≥ $10^{10}$ Ω |
| **Temperature range** | |
| turned version | -55 °C … + 125 °C |
| stamped solder bucket version | -40 °C … + 85 °C |

**Terminations**

a) Solder buckets
AWG 20

b) Stamped crimp contacts
AWG 28-24
0.09-0.25 mm²
max. insulation Ø 1.02 mm
AWG 24-20
0.25-0.56 mm²
max. insulation Ø 1.52 mm

c) Turned crimp contacts
AWG 22-18
0.33-0.82 mm²
AWG 24-20
0.25-0.52 mm²
AWG 26-22
0.13-0.33 mm²
AWG 28-24
0.09-0.25 mm²
max. insulation Ø 2.15 mm

d) Insulation displacement
AWG 28/7 and AWG 26/7

| | |
|---|---|
| **Materials** | |
| Mouldings and hoods | Thermoplastic resin, glass-fibre filled (PBTP), UL 94-V0 |
| Contacts | Copper alloy |
| **Contact surface** | |
| Contact zone | selectively plated according to performance level[1)] |
| Metal shell | Plated steel |

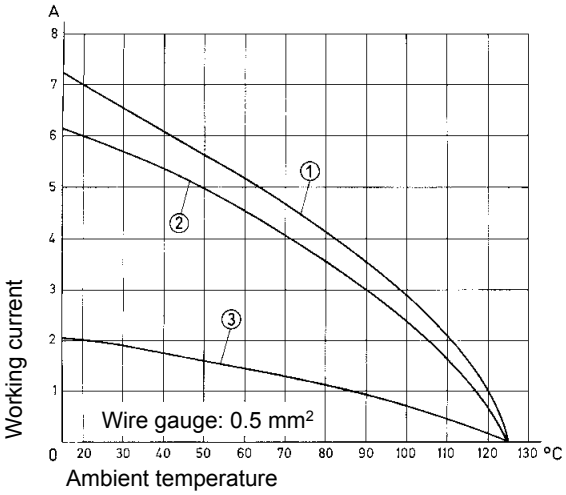
**Mating force**

| | |
|---|---|
| 9 way | ≤ 30 N |
| 15 way | ≤ 50 N |
| 25 way | ≤ 83 N |
| 37 way | ≤ 123 N |
| 50 way | ≤ 167 N |

## Current carrying capacity

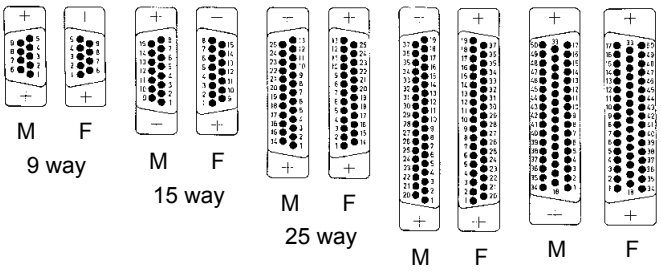
The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512.



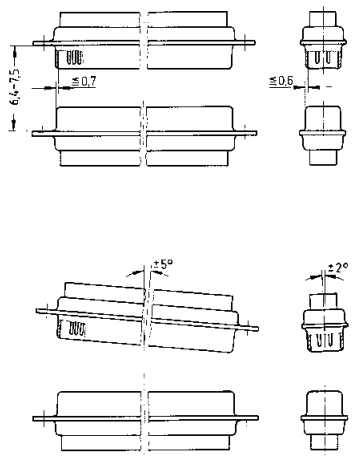

Example: 25 way connector
① Turned contacts
② Stamped contacts
③ Insulation displacement contacts

## Contact arrangement View from termination side




M = Male connector
F = Female connector

## Mating conditions as per DIN 41 652




[1)] Performance level 3, 50 mating cycles, no gas test
Performance level 2 as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512
Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512



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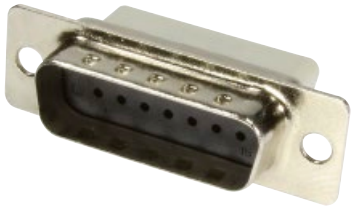
Number of contacts

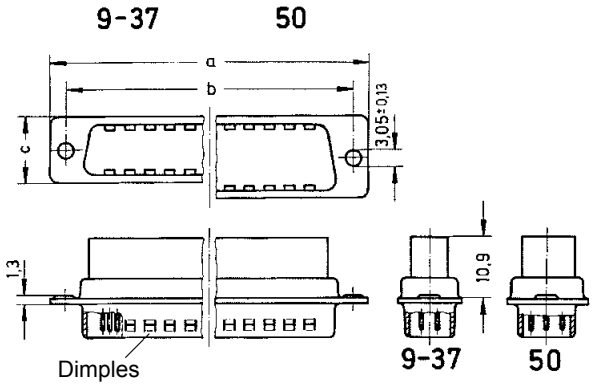
# 9–50



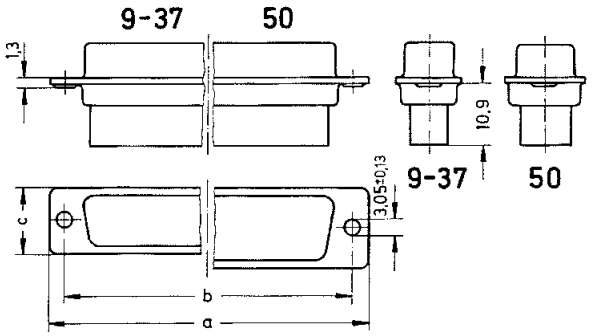
## Crimp terminal

| Identification | No. of contacts | Part number |
|---|---|---|
| **Male connector**<br>Order contacts separately<br>metal shell with dimples | 9<br>15<br>25<br>37<br>50 | 09 67 009 5601<br>09 67 015 5601<br>09 67 025 5601<br>09 67 037 5601<br>09 67 050 5601 |
| **Female connector**<br>Order contacts separately<br>metal shell | 9<br>15<br>25<br>37<br>50 | 09 67 009 4701<br>09 67 015 4701<br>09 67 025 4701<br>09 67 037 4701<br>09 67 050 4701 |

**Male connector**




**Female connector**




| | a | $b_{\pm 0.1}$ | c |
|---|---|---|---|
| 9 | 30.9 | 25.0 | 12.5 |
| 15 | 39.2 | 33.3 | 12.5 |
| 25 | 53.1 | 47.0 | 12.5 |
| 37 | 69.4 | 63.5 | 12.5 |
| 50 | 67.0 | 61.1 | 15.4 |

**Panel cut out for front/rear mount**

Values are taken from the CECC 75301-802

see page 05.24

Dimensions in mm



Tooling see chapter 20

Crimp contacts see pages 05.27 ff
Mating conditions see page 05.04

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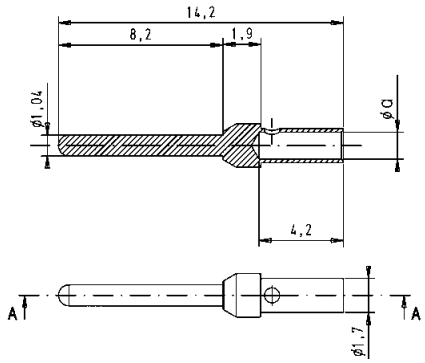
## Turned crimp contacts

| Identification | Wire gauge ($mm^2$) | Part number | | |
|---|---|---|---|---|
| | | Male contacts | Female contacts | High-end female contacts |
| | | Performance level 1* | Performance level 1* | Performance level 1* |
| Individual contacts[1)] | AWG 22-18 0.33-0.82 | 09 67 000 3576 | 09 67 000 3476 | 09 67 000 3676 |
| | AWG 24-20 0.25-0.52 | 09 67 000 8576 | 09 67 000 8476 | 09 67 000 8676 |
| | AWG 26-22 0.13-0.33 | 09 67 000 5576 | 09 67 000 5476 | 09 67 000 5676 |
| | AWG 28-24 0.09-0.25 | 09 67 000 7576 | 09 67 000 7476 | 09 67 000 7676 |

[1)] Minimum order 100 pieces or multiples of 100

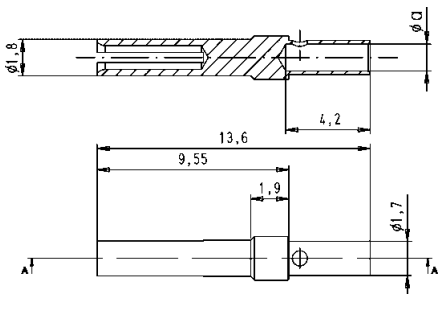
### Male contacts



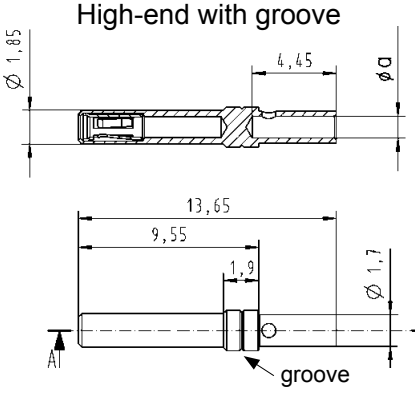

| | a | groove |
|---|---|---|
| AWG 22-18 | 1.34 | none |
| AWG 24-20 | 1.13 | 1 |
| AWG 26-22 | 0.88 | 2 |
| AWG 28-24 | 0.64 | 3 |

### Female contacts

Standard




High-end with groove




* Performance level 1 as per CECC 75301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60512
Use crimp tool with the part no. 09 99 000 0501 and the locator with the part no. 09 99 000 0531. Details see chapter 20



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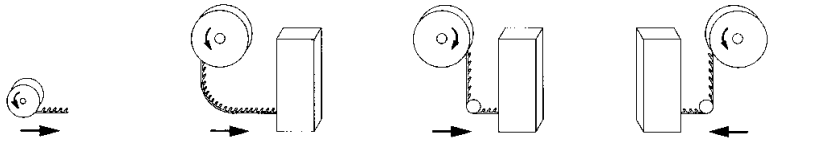
## Stamped crimp contacts



| Identification | Wire gauge ($mm^2$) | Part number | | |
|---|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.04<br>Other performance levels on request | | stamped male contacts | | |
| | | Performance level 3 | Performance level 2 | Performance level 1 |
| **Individual contacts** | AWG 28-24<br>0.09-0.25<br>stranded | 09 67 000 7177[1)] | 09 67 000 7178[1)] | 09 67 000 7176[1)] |
| **500 pieces/reel** | | | | |
| Unrolling left | | 09 67 000 7167 | 09 67 000 7168 | 09 67 000 7166 |
| **10 000 pieces/reel** | | | | |
| Unrolling left | | 09 67 000 7157 | 09 67 000 7158 | 09 67 000 7156 |
| Unrolling left reversed | | 09 67 000 7147 | 09 67 000 7148 | 09 67 000 7146 |
| Unrolling right reversed | | 09 67 000 7137 | 09 67 000 7138 | 09 67 000 7136 |
| **Individual contacts** | AWG 24-20<br>0.25-0.56<br>stranded | 09 67 000 8177[1)] | 09 67 000 8178[1)] | 09 67 000 8176[1)] |
| **500 pieces/reel** | | | | |
| Unrolling left | | 09 67 000 8167 | 09 67 000 8168 | 09 67 000 8166 |
| **10 000 pieces/reel** | | | | |
| Unrolling left | | 09 67 000 8157 | 09 67 000 8158 | 09 67 000 8156 |
| Unrolling left reversed | | 09 67 000 8147 | 09 67 000 8148 | 09 67 000 8146 |
| Unrolling right reversed | | 09 67 000 8137 | 09 67 000 8138 | 09 67 000 8136 |

**Unrolling direction**



| 500 pieces/reel Unrolling left | 10 000 pieces/reel Unrolling left | 10 000 pieces/reel Unrolling left reversed | 10 000 pieces/reel Unrolling right reversed |
|---|---|---|---|

for HARTING tools



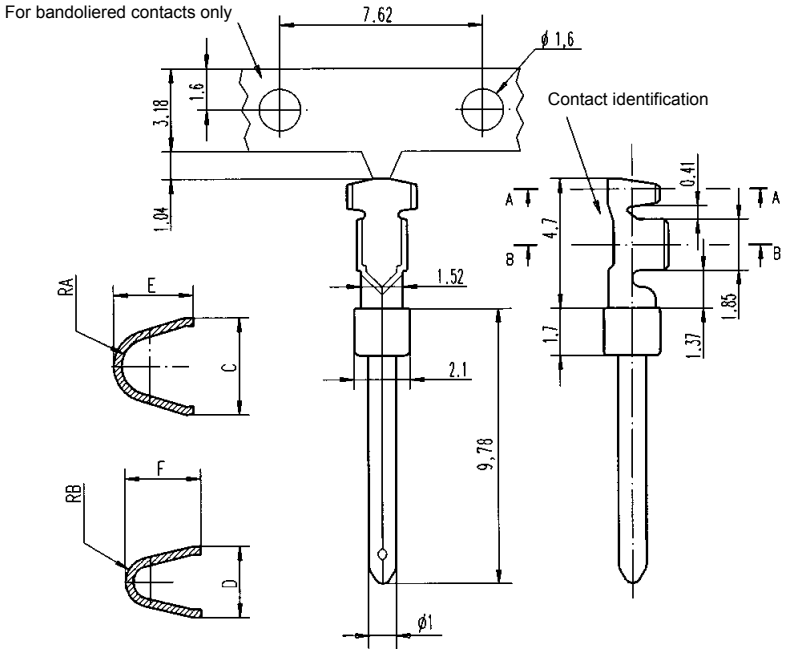
[1)] Minimum order 500 pieces or multiples of 500
Insertion and removal tool see chapter 20
Contact dimensions see page 05.29

Downloaded from Arrow.com.

# Stamped crimp contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male contacts




| AWG | C | D | E | F | RA | RB | Contact identification |
|---|---|---|---|---|---|---|---|
| 20-24 | 2.46 | 1.78 | 1.98 | 1.90 | 0.71 | 0.43 | —— |
| 24-28 | 1.65 | 1.47 | 1.52 | 1.52 | 0.50 | 0.33 | ==== |





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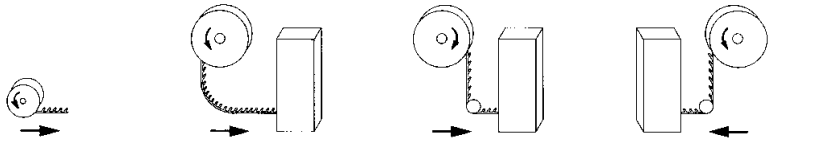
## Stamped crimp contacts



| Identification | Wire gauge ($mm^2$) | Part number | | |
|---|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.04<br>Other performance levels on request | | stamped female contacts | | |
| | | Performance level 3 | Performance level 2 | Performance level 1 |
| **Individual contacts** | AWG 28-24<br>0.09-0.25<br>stranded | 09 67 000 7277[1)] | 09 67 000 7278[1)] | 09 67 000 7276[1)] |
| **500 pieces/reel** | | | | |
| Unrolling left | | 09 67 000 7267 | 09 67 000 7268 | 09 67 000 7266 |
| **10 000 pieces/reel** | | | | |
| Unrolling left | | 09 67 000 7257 | 09 67 000 7258 | 09 67 000 7256 |
| Unrolling left reversed | | 09 67 000 7247 | 09 67 000 7248 | 09 67 000 7246 |
| Unrolling right reversed | | 09 67 000 7237 | 09 67 000 7238 | 09 67 000 7236 |
| **Individual contacts** | AWG 24-20<br>0.25-0.56<br>stranded | 09 67 000 8277[1)] | 09 67 000 8278[1)] | 09 67 000 8276[1)] |
| **500 pieces/reel** | | | | |
| Unrolling left | | 09 67 000 8267 | 09 67 000 8268 | 09 67 000 8266 |
| **10 000 pieces/reel** | | | | |
| Unrolling left | | 09 67 000 8257 | 09 67 000 8258 | 09 67 000 8256 |
| Unrolling left reversed | | 09 67 000 8247 | 09 67 000 8248 | 09 67 000 8246 |
| Unrolling right reversed | | 09 67 000 8237 | 09 67 000 8238 | 09 67 000 8236 |

**Unrolling direction**



| 500 pieces/reel Unrolling left | 10 000 pieces/reel Unrolling left | 10 000 pieces/reel Unrolling left reversed | 10 000 pieces/reel Unrolling right reversed |
|---|---|---|---|

for HARTING tools



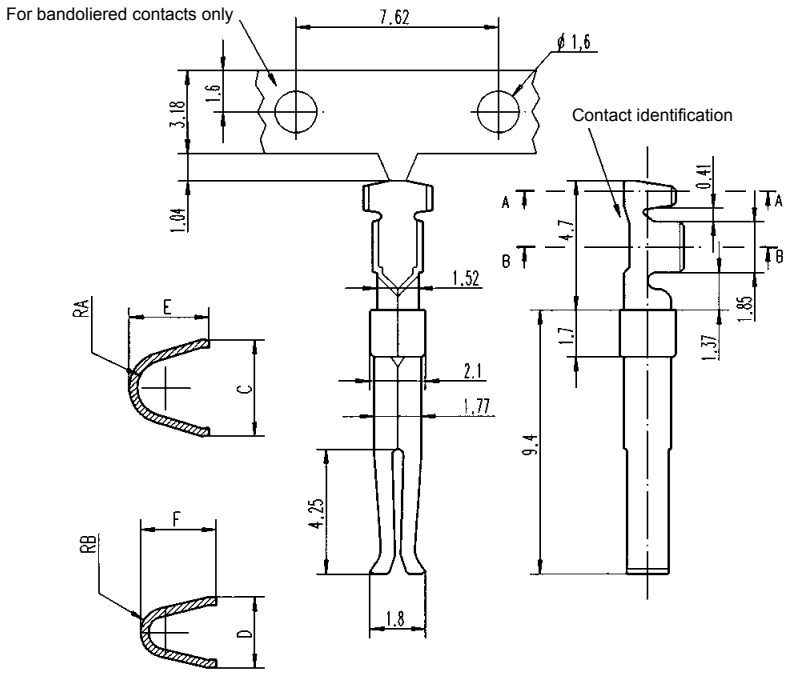
[1)] Minimum order 500 pieces or multiples of 500
Insertion and removal tool see chapter 20
Contact dimensions see page 05.31

Downloaded from Arrow.com.

# Stamped crimp contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Female contacts




| AWG | C | D | E | F | RA | RB | Contact identification |
|---|---|---|---|---|---|---|---|
| 20-24 | 2.46 | 1.78 | 1.98 | 1.90 | 0.71 | 0.43 | —— |
| 24-28 | 1.65 | 1.47 | 1.52 | 1.52 | 0.50 | 0.33 | ==== |





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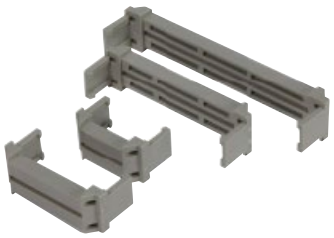
Number of contacts

# 9–37



## Insulation displacement termination



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.04<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector**[2]<br>pitch 1.27 mm<br>metal shell with dimples | 9 | 09 66 128 770 . | 09 66 128 670 . |
| | 15 | 09 66 228 770 . | 09 66 228 670 . |
| | 25 | 09 66 328 770 . | 09 66 328 670 . |
| | 37 | 09 66 428 770 . | 09 66 428 670 . |
| **Female connector**<br>pitch 1.27 mm<br>metal shell | 9 | 09 66 118 750 . | 09 66 118 650 . |
| | 15 | 09 66 218 750 . | 09 66 218 650 . |
| | 25 | 09 66 318 750 . | 09 66 318 650 . |
| | 37 | 09 66 418 750 . | 09 66 418 650 . |
| Please insert digit for flange thread<br>ø 3.1 mm hole ▶ 0<br>M3 ▶ 1[1]<br>4-40 UNC ▶ 2 | | | |
| **Strain relief clamp**<br>plastic for male and female connector | 9 | 09 66 108 0001 | 09 66 108 0001 |
| | 15 | 09 66 208 0001 | 09 66 208 0001 |
| | 25 | 09 66 308 0001 | 09 66 308 0001 |
| | 37 | 09 66 408 0001 | 09 66 408 0001 |

[1] Not normally kept in stock
[2] Not released for halogen free flat cables



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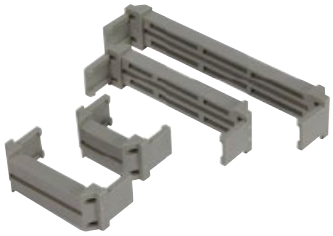
Number of contacts

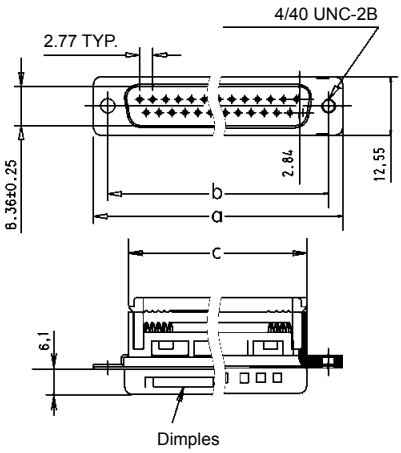
# 9–37

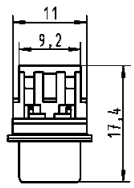


## Insulation displacement termination

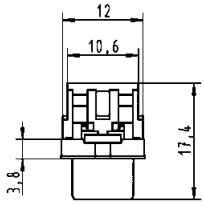
| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Male connector



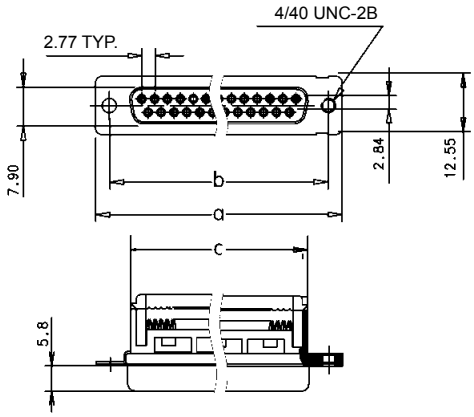



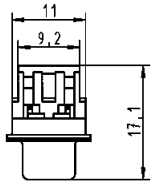

Ø 3.1 mm hole



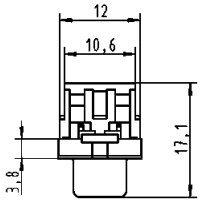

M3 or 4-40 UNC thread

### Female connector




Ø 3.1 mm hole



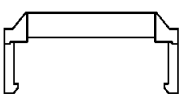

M3 or 4-40 UNC thread

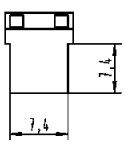
### Male and female connectors

| | a | $b_{\pm 0.1}$ | c |
|---|---|---|---|
| 9 | 30.8 | 24.99 | 16.5 |
| 15 | 39.2 | 33.32 | 24.3 |
| 25 | 53.1 | 47.04 | 38.1 |
| 37 | 69.4 | 63.50 | 54.9 |

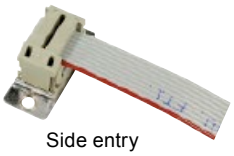
Specified conductors
stranded wires – AWG 28/7
– AWG 26/7

### Strain relief clamps





Top entry



Side entry

### Panel cut out for front/rear mount

Values are taken from the CECC 75 301-802

see page 05.24





Tooling see chapter 20

Mating conditions see page 05.04
Mounting details see page 05.24

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Number of contacts

# 9–50

## Solder buckets



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** Explanations see page 05.04 Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector** metal shell with dimples | | | |
| | | turned contacts | turned contacts |
| | 9 | 09 67 009 5604 | 09 67 009 5615 |
| | 15 | 09 67 015 5604 | 09 67 015 5615 |
| | 25 | 09 67 025 5604 | 09 67 025 5615 |
| | 37 | 09 67 037 5604 | 09 67 037 5615 |
| | 50 | 09 67 050 5604 | 09 67 050 5615 |
| | | stamped contacts | stamped contacts |
| | 9 | 09 67 209 5604 | 09 67 209 5615 |
| | 15 | 09 67 215 5604 | 09 67 215 5615 |
| | 25 | 09 67 225 5604 | 09 67 225 5615 |
| | 37 | 09 67 237 5604 | 09 67 237 5615 |
| | 50 | 09 67 250 5604 | 09 67 250 5615 |
| **Female connector** metal shell | | | |
| | | turned contacts | turned contacts |
| | 9 | 09 67 009 4704 | 09 67 009 4715 |
| | 15 | 09 67 015 4704 | 09 67 015 4715 |
| | 25 | 09 67 025 4704 | 09 67 025 4715 |
| | 37 | 09 67 037 4704 | 09 67 037 4715 |
| | 50 | 09 67 050 4704 | 09 67 050 4715 |
| | | stamped contacts | stamped contacts |
| | 9 | 09 67 209 4704 | 09 67 209 4715 |
| | 15 | 09 67 215 4704 | 09 67 215 4715 |
| | 25 | 09 67 225 4704 | 09 67 225 4715 |
| | 37 | 09 67 237 4704 | 09 67 237 4715 |
| | 50 | 09 67 250 4704 | 09 67 250 4715 |



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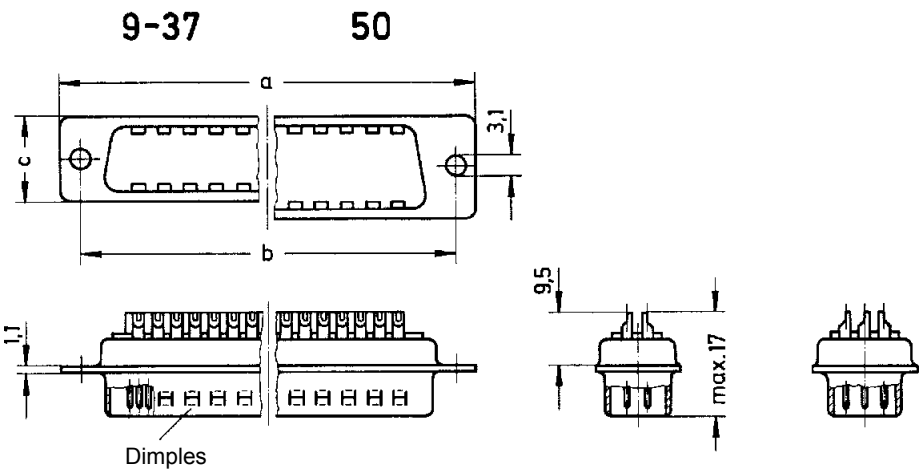
Number of contacts

# 9–50

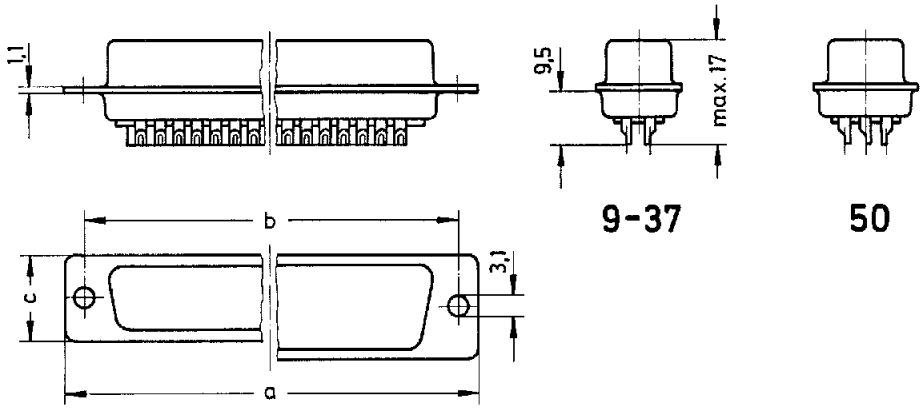
## Solder buckets

| Identification | Drawing | Dimensions in mm |
|---|---|---|

Male connector




Female connector




| | a | $b_{\pm 0.1}$ | c |
|---|---|---|---|
| 9 | 30.9 | 25.0 | 12.5 |
| 15 | 39.2 | 33.3 | 12.5 |
| 25 | 53.1 | 47.0 | 12.5 |
| 37 | 69.4 | 63.5 | 12.5 |
| 50 | 67.0 | 61.1 | 15.4 |

Panel cut out
for front/rear mount

Values are taken from the CECC 75301-802

see page 05.24





Mating conditions see page 05.04

Downloaded from Arrow.com.

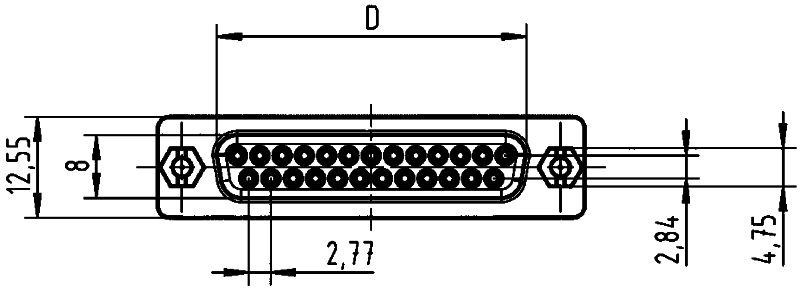
Number of contacts

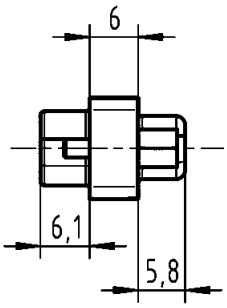
# 9–37

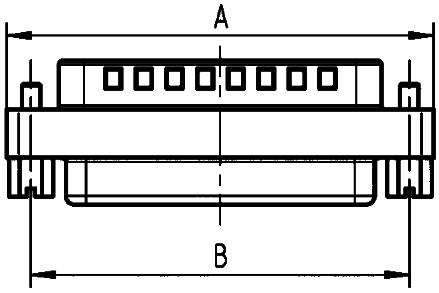
## Gender changer

| Identification | No. of contacts | Part number |
|---|---|---|
| Male / female gender changer | 9 | 09 67 009 0605 |
| | 15 | 09 67 015 0605 |
| | 25 | 09 67 025 0605 |
| | 37 | 09 67 037 0605 |

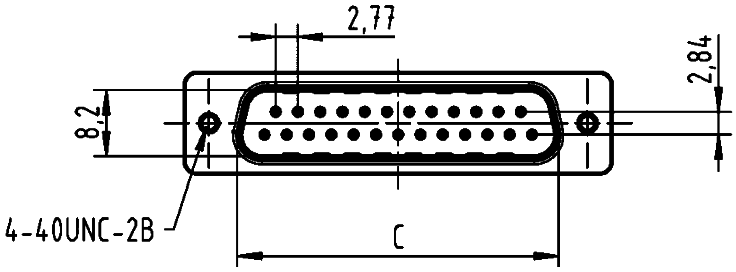
Dimensions




| | A | B | C | D |
|---|---|---|---|---|
| 9 | 30.8 | 25.0 | 16.92 | 16.35 |
| 15 | 39.2 | 33.3 | 25.25 | 24.7 |
| 25 | 53.05 | 47.04 | 38.96 | 38.4 |
| 37 | 69.4 | 63.5 | 55.42 | 54.8 |




Dimensions in mm



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# Notes





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| | |
|---|---|
| Number of contacts | 15, 26, 44, 62, 78 |
| Working current<br>Stamped contacts | 2 A max. |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Clearance and creepage | ≥ 1.0 mm |
| Contact resistance | < 20 mΩ<br>< 25 mΩ (for right angled versions) |
| Insulation resistance | ≥ 5 x $10^9$ Ω |
| Temperature range<br>The higher temperature limit includes the local ambient and heating effect of the contacts under load | -40 °C … + 85 °C |
| Terminations | a) Solder pins Ø 0.65 mm for P.C.B. holes Ø 1.0 mm<br>b) Crimp contacts<br>AWG 26 - 24<br>0.14 - 0.22 mm²<br>max. insulation Ø 1.38 mm<br>c) Solder cups<br>AWG 24 |
| Materials<br>Mouldings and hoods | Thermoplastic resin, glass-fibre filled (PBTP), UL 94-V0 |
| Contacts | Copper alloy |
| Contact surface<br>Contact zone | selectively plated according to performance level[1)] |
| Metal shell | Nickel plated steel |
| Mating force<br>15 way<br>26 way<br>44 way<br>62 way<br>78 way | ≤ 46 N<br>≤ 77 N<br>≤ 127 N<br>≤ 177 N<br>≤ 222 N |

Number of contacts in the D-Sub standard/D-Sub high density range related to the shell size.

| Shell size | D-Sub standard | D-Sub high density |
|---|---|---|
| 1 | 9 | 15 |
| 2 | 15 | 26 |
| 3 | 25 | 44 |
| 4 | 37 | 62 |
| 5 | 50 | 78 |

[1)] Performance level 3, 50 mating cycles, no gas test
S4, plating = 0.76 µm (30 µinch) Au or PdNi equivalent



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Number of contacts

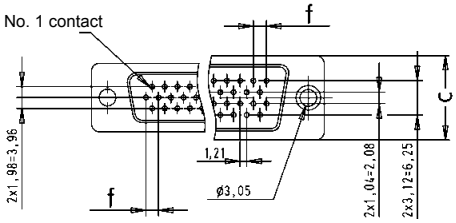
# 15–78

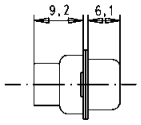
## High density crimp terminal

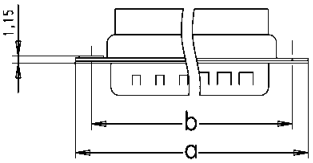
| Identification | No. of contacts | Part number |
|---|---|---|
| **Male connector** | 15 | 09 56 100 5601 |
| Order contacts separately | 26 | 09 56 200 5601 |
| | 44 | 09 56 300 5601 |
| metal shell with dimples | 62 | 09 56 400 5601 |
| | 78 | 09 56 500 5601 |
| **Female connector** | 15 | 09 56 100 4701 |
| Order contacts separately | 26 | 09 56 200 4701 |
| | 44 | 09 56 300 4701 |
| metal shell | 62 | 09 56 400 4701 |
| | 78 | 09 56 500 4701 |

**Male connector**

15-62 78

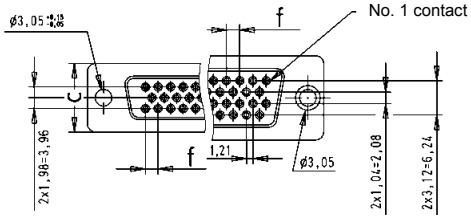


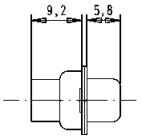



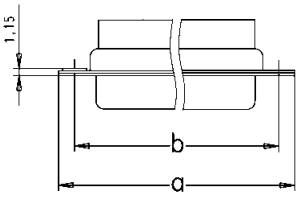




| | a | b | c | f |
|---|---|---|---|---|
| 15 | 30.9 | 25.0 | 12.5 | 2.29 |
| 26 | 39.2 | 33.3 | 12.5 | 2.29 |
| 44 | 53.1 | 47.0 | 12.5 | 2.29 |
| 62 | 69.4 | 63.5 | 12.5 | 2.41 |
| 78 | 67.0 | 61.1 | 15.4 | 2.41 |

**Female connector**

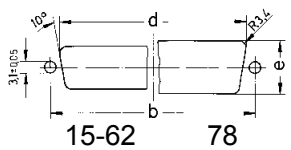



**Panel cut out for front/rear mount**

Values are taken from the CECC 75301-802




Front mount

| | $b_{\pm 0.13}$ | $d_{\pm 0.2}$ | $e_{\pm 0.2}$ |
|---|---|---|---|
| 15 | 25.0 | 22.2 | 12.3 |
| 26 | 33.3 | 30.5 | 12.3 |
| 44 | 47.0 | 44.3 | 12.3 |
| 62 | 63.5 | 60.7 | 12.3 |
| 78 | 61.1 | 58.3 | 15.1 |

Rear mount

| | $b_{\pm 0.13}$ | $d_{\pm 0.2}$ | $e_{\pm 0.2}$ |
|---|---|---|---|
| 15 | 25.0 | 20.5 | 11.4 |
| 26 | 33.3 | 28.8 | 11.4 |
| 44 | 47.0 | 42.5 | 11.4 |
| 62 | 63.5 | 59.1 | 11.4 |
| 78 | 61.1 | 56.3 | 14.1 |

Dimensions in mm

Tooling see chapter 20

Crimp contacts see page 05.40



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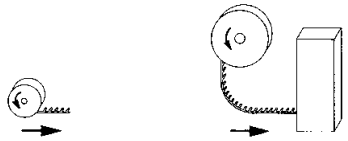
# Crimp contacts for high density connectors

| Identification | Wire gauge ($mm^2$) | Part number | | | |
|---|---|---|---|---|---|
| Performance levels<br>Explanations see page 05.04<br>Other performance levels on request ▶ | | stamped male contacts | | stamped female contacts | |
| | | Performance level 3 | S4[1)] | Performance level 3 | S4[1)] |
| 500 pieces/box | AWG 26-24<br>0.14-0.22<br>stranded | 09 56 000 8177 | 09 56 000 8175 | 09 56 000 8277 | 09 56 000 8275 |
| 500 pieces/reel<br>Unrolling left | | 09 56 000 8167 | 09 56 000 8165 | 09 56 000 8267 | 09 56 000 8265 |
| 10 000 pieces/reel<br>Unrolling left | | 09 56 000 8157 | 09 56 000 8155 | 09 56 000 8257 | 09 56 000 8255 |

Unrolling direction



500 pieces/reel Unrolling left

10 000 pieces/reel Unrolling left

for HARTING tools

[1)] S4 = 0.76 µm (30 µinch) Au or PdNi equivalent
Contact dimensions see page 05.41



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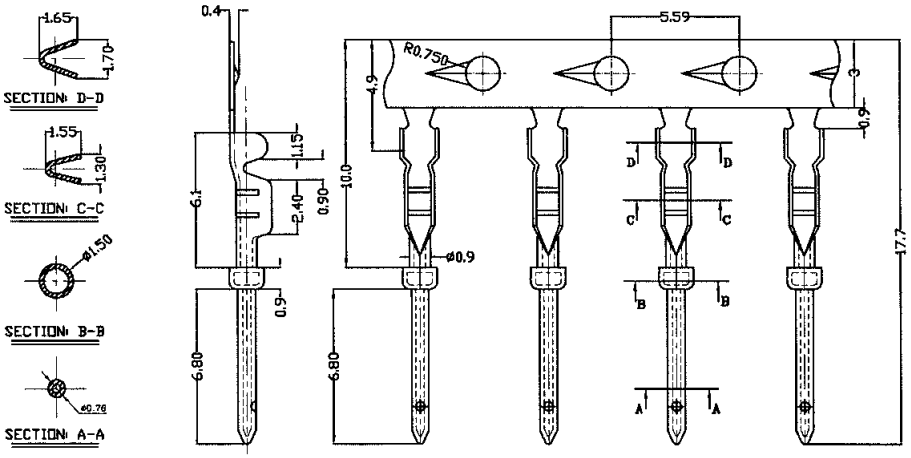
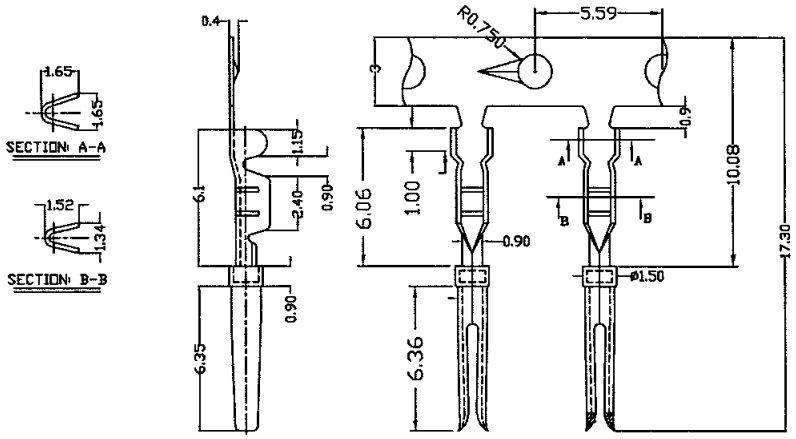
## Crimp contacts for high density connectors

| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Male contacts
wire gauge AWG 26-24




### Female contacts
wire gauge AWG 26-24



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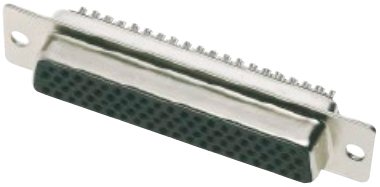
Number of contacts

# 15–78



## High density with stamped solder cups, straight

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | Performance level 3 | S4[1] |
| **Male connector**<br>metal shell with dimples | 15 | 09 56 100 5604 | 09 56 100 5615 050 |
| | 26 | 09 56 200 5604 | 09 56 200 5615 050 |
| | 44 | 09 56 300 5604 | 09 56 300 5615 050 |
| | 62 | 09 56 400 5604 | 09 56 400 5615 050 |
| | 78 | 09 56 500 5604 | 09 56 500 5615 050 |
| **Female connector**<br>metal shell | 15 | 09 56 100 4704 | 09 56 100 4715 050 |
| | 26 | 09 56 200 4704 | 09 56 200 4715 050 |
| | 44 | 09 56 300 4704 | 09 56 300 4715 050 |
| | 62 | 09 56 400 4704 | 09 56 400 4715 050 |
| | 78 | 09 56 500 4704 | 09 56 500 4715 050 |

**Performance levels**
Explanations see page 05.04
Other performance levels on request

[1] S4 = 0.76 µm (30 µinch) Au or PdNi equivalent



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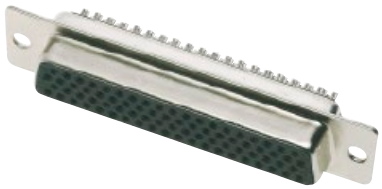
Number of contacts

# 15–78

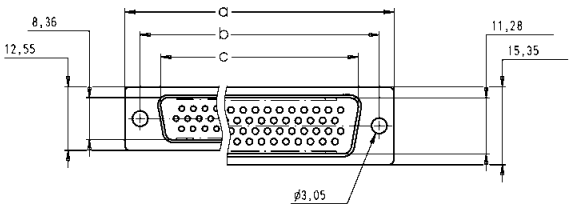


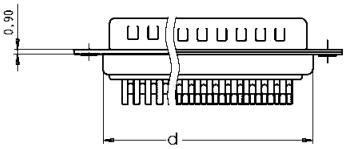
## High density with stamped solder cups, straight

| Identification | Drawing | Dimensions in mm |
|---|---|---|

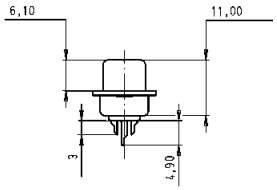
### Male connector

15-62 78

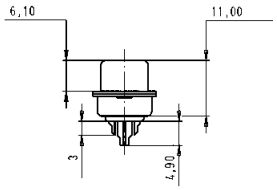



15-62



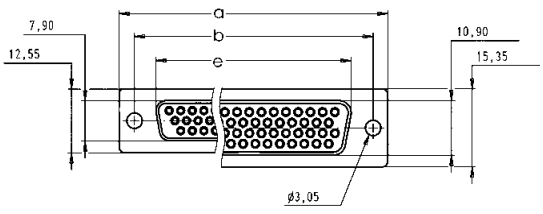

78

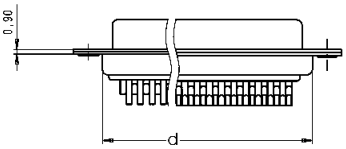



| | a | b | c | d | e |
|---|---|---|---|---|---|
| 15 | 30.81 | 25.00 | 16.92 | 19.20 | 16.33 |
| 26 | 39.20 | 33.30 | 25.25 | 27.70 | 24.70 |
| 44 | 53.05 | 47.00 | 38.96 | 41.10 | 38.40 |
| 62 | 69.40 | 63.50 | 55.42 | 57.30 | 54.80 |
| 78 | 67.00 | 61.00 | 52.81 | 55.10 | 52.20 |

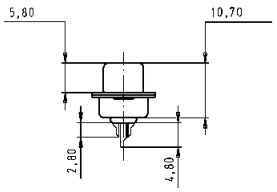
### Female connector

15-62 78

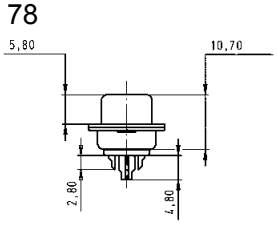



15-62




78



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Number of contacts

# 15–78

## High density with stamped solder pins, angled with grounding board locks

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** Explanations see page 05.04 Other performance levels on request ▶ | | Performance level 3 | S4[1] |
| **Male connector** metal shell with dimples | 15 | 09 56 162 781 . | 09 56 162 581 . |
| | 26 | 09 56 262 781 . | 09 56 262 581 . |
| | 44 | 09 56 362 781 . | 09 56 362 581 . |
| | 62 | 09 56 462 781 . | 09 56 462 581 . |
| | 78 | 09 56 562 781 . | 09 56 562 581 . |
| **Female connector** metal shell | 15 | 09 56 152 761 . | 09 56 152 561 . |
| | 26 | 09 56 252 761 . | 09 56 252 561 . |
| | 44 | 09 56 352 761 . | 09 56 352 561 . |
| | 62 | 09 56 452 761 . | 09 56 452 561 . |
| | 78 | 09 56 552 761 . | 09 56 552 561 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| 4-40 UNC ▶ 2 | | | |
| fitted screw locks 4-40 UNC ▶ 3 | | | |

[1] S4 = 0.76 µm (30 µinch) Au or PdNi equivalent



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Number of contacts

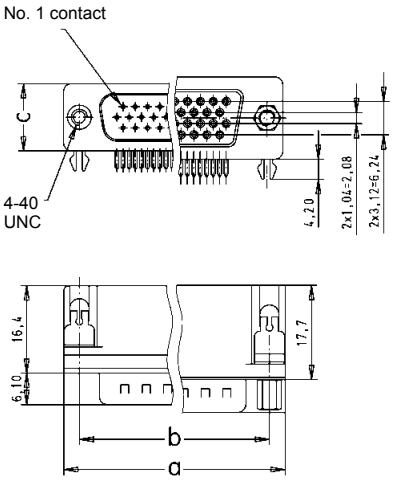
# 15–78

High density with stamped solder pins, angled with grounding board locks

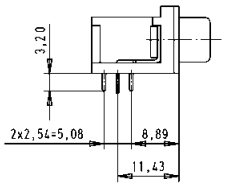
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

15-62 78

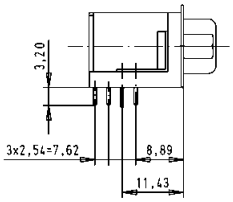



15-62




4-40 UNC

78

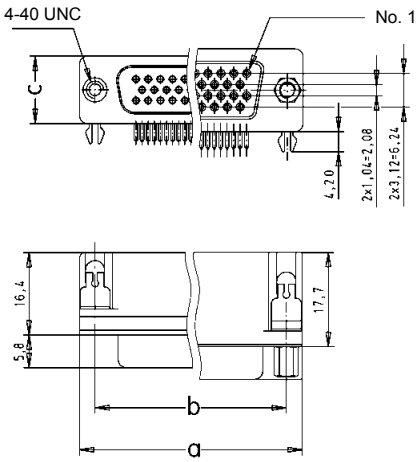



fitted screw locks
4-40 UNC

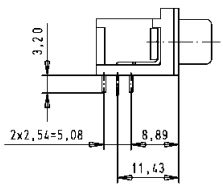
| | a | $b_{\pm 0.1}$ | c |
|---|---|---|---|
| 15 | 30.81 | 24.99 | 12.55 |
| 26 | 39.20 | 33.30 | 12.55 |
| 44 | 53.05 | 47.04 | 12.55 |
| 62 | 69.40 | 63.50 | 12.55 |
| 78 | 67.00 | 61.00 | 15.37 |

## Female connector

15-62 78

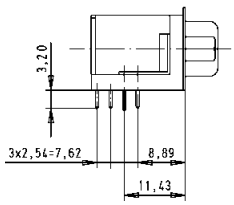



15-62




4-40 UNC

78




fitted screw locks
4-40 UNC



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Number of contacts

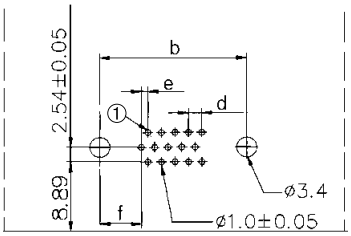
# 15–78

High density with stamped solder pins, angled with grounding board locks

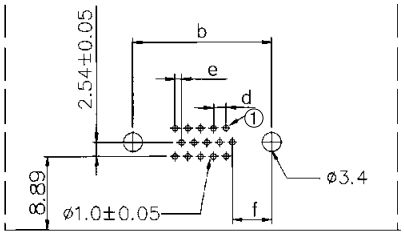
| Identification | Drawing | Dimensions in mm |
|---|---|---|

Board drillings

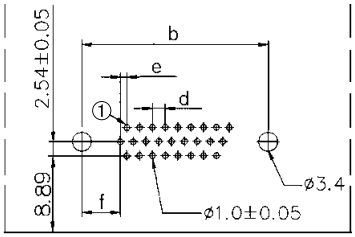
male 15



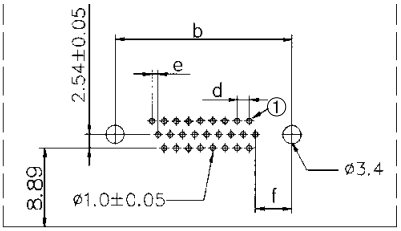

female 15



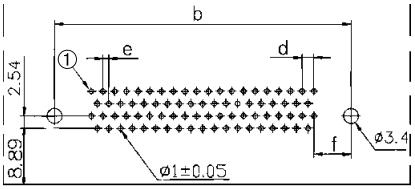

male 26-62



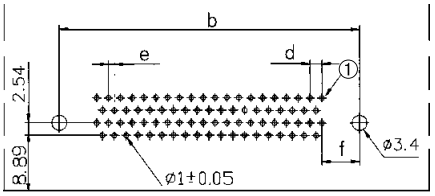

female 26-62




male 78




female 78




① = No. 1 contact

| | $b_{\pm 0.1}$ | d | e | f |
|---|---|---|---|---|
| 15 | 24.99 | 2.29 | 1.145 | 7.04 |
| 26 | 33.30 | 2.29 | 1.145 | 6.88 |
| 44 | 47.04 | 2.29 | 1.145 | 6.88 |
| 62 | 63.50 | 2.41 | 1.205 | 7.00 |
| 78 | 61.00 | 2.41 | 1.205 | 7.65 |



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Number of contacts

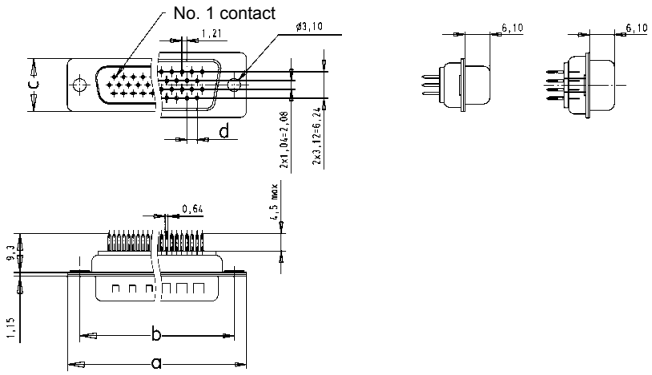
# 15–78

## High density with stamped solder pins, straight

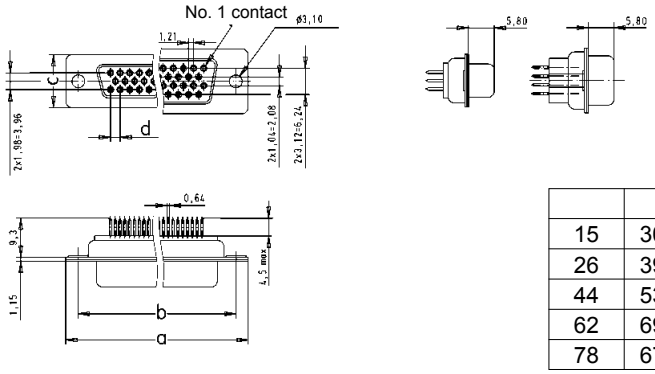
| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶ Explanations see page 05.04 Other performance levels on request | | Performance level 3 | S4[1] |
| **Male connector** metal shell with dimples | 15 | 09 56 161 7700 | 09 56 161 5700 |
| | 26 | 09 56 261 7700 | 09 56 261 5700 |
| | 44 | 09 56 361 7700 | 09 56 361 5700 |
| | 62 | 09 56 461 7700 | 09 56 461 5700 |
| | 78 | 09 56 561 7700 | 09 56 561 5700 |
| **Female connector** metal shell | 15 | 09 56 151 7500 | 09 56 151 5500 |
| | 26 | 09 56 251 7500 | 09 56 251 5500 |
| | 44 | 09 56 351 7500 | 09 56 351 5500 |
| | 62 | 09 56 451 7500 | 09 56 451 5500 |
| | 78 | 09 56 551 7500 | 09 56 551 5500 |

Male connector

15-62 78 15-62 78

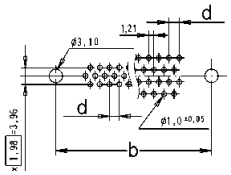



Female connector




| | a | b ±0.1 | c | d |
|---|---|---|---|---|
| 15 | 30.9 | 25.0 | 12.5 | 2.29 |
| 26 | 39.2 | 33.3 | 12.5 | 2.29 |
| 44 | 53.1 | 47.0 | 12.5 | 2.29 |
| 62 | 69.4 | 63.5 | 12.5 | 2.41 |
| 78 | 67.0 | 61.1 | 15.4 | 2.41 |

Board drillings




Dimensions in mm

[1] S4 = 0.76 µm (30 µinch) Au or PdNi equivalent



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Number of contacts

# 15–78

High density with stamped solder pins, straight with grounding board locks

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| Performance levels<br>Explanations see page 05.04<br>Other performance levels on request ▶ | | Performance level 3 | S4[1] |
| **Male connector**<br>metal shell with dimples | | | |
| | 15 | 09 56 161 771 . | 09 56 161 571 . |
| | 26 | 09 56 261 771 . | 09 56 261 571 . |
| | 44 | 09 56 361 771 . | 09 56 361 571 . |
| | 62 | 09 56 461 771 . | 09 56 461 571 . |
| | 78 | 09 56 561 771 . | 09 56 561 571 . |
| **Female connector**<br>metal shell | | | |
| | 15 | 09 56 151 751 . | 09 56 151 551 . |
| | 26 | 09 56 251 751 . | 09 56 251 551 . |
| | 44 | 09 56 351 751 . | 09 56 351 551 . |
| | 62 | 09 56 451 751 . | 09 56 451 551 . |
| | 78 | 09 56 551 751 . | 09 56 551 551 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| 4-40 UNC ▶ 2 | | | |
| fitted screw locks 4-40 UNC ▶ 3 | | | |

[1] S4 = 0.76 µm (30 µinch) Au or PdNi equivalent



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Number of contacts

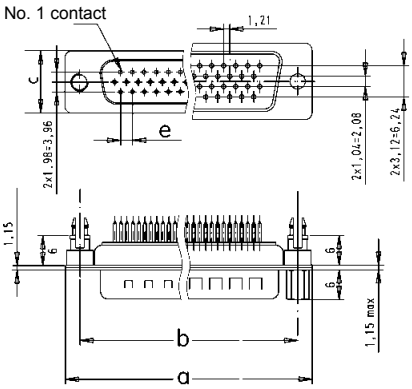
# 15–78

High density with stamped solder pins, straight with grounding board locks

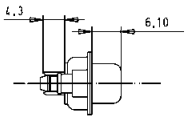
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

15-62 78

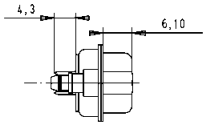



15-62




4-40 UNC

78

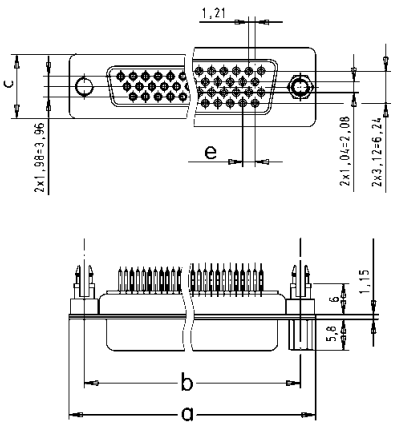



fitted screw locks
4-40 UNC

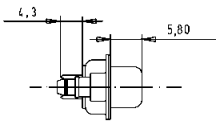
| | a | $b_{\pm 0.1}$ | c | e |
|---|---|---|---|---|
| 15 | 30.9 | 25.0 | 12.5 | 2.29 |
| 26 | 39.2 | 33.3 | 12.5 | 2.29 |
| 44 | 53.1 | 47.0 | 12.5 | 2.29 |
| 62 | 69.4 | 63.5 | 12.5 | 2.41 |
| 78 | 67.0 | 61.1 | 15.4 | 2.41 |

## Female connector

15-62 78

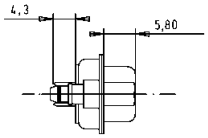



15-62




4-40 UNC

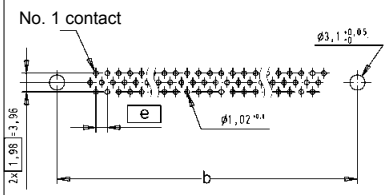
78



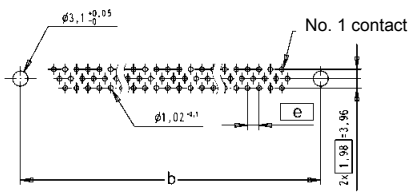

fitted screw locks
4-40 UNC

## Board drillings

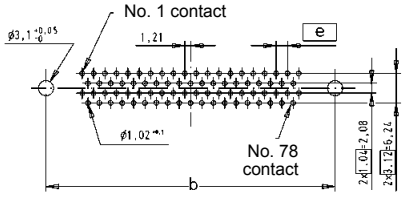
male 15-62



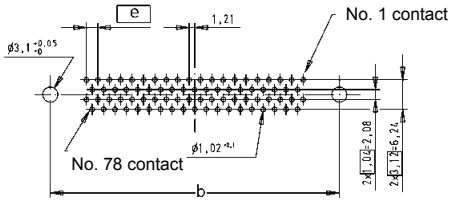

female 15-62




male 78




female 78



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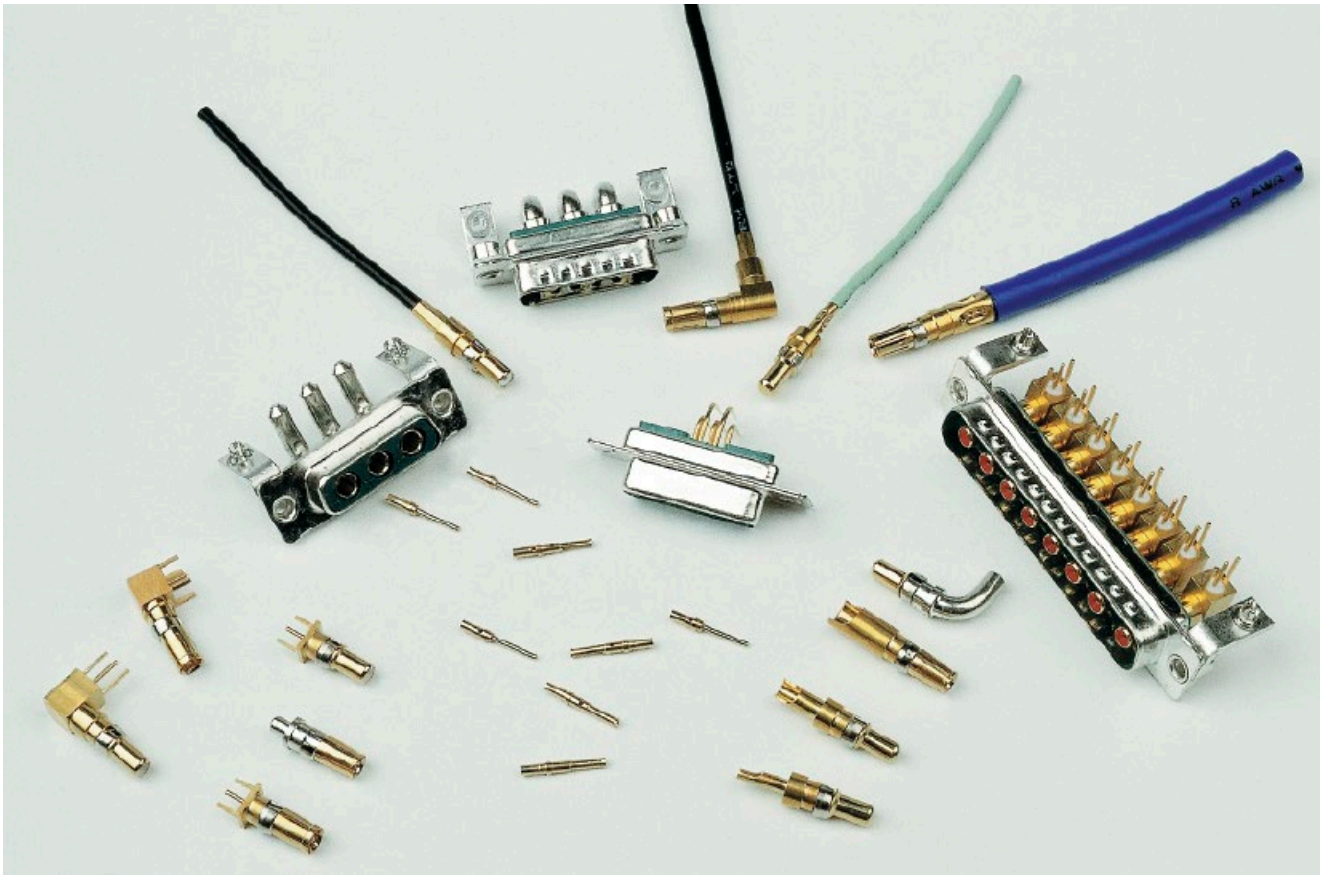

HARTINGs' mixed D-Sub range brings the advantage of an industry standard I/O interconnect product with the possibility to customise for any application.

The range is designed around ***the standard D-Sub shell sizes*** with ***the possibility to have a blend of contacts*** such as signals with coaxial, power, high voltage or pneumatic contacts. Due to its construction, the product is ***fully shielded*** and helps reducing the EMI/RFI leakage.

All contacts are machined with two different platings.

When hot plug-in is required, ***first mate last break*** contacts can also be supplied.

For connectors to be fitted on a board with SMT components, they can be supplied in an ***SMC (PiHIR) version*** which is assembled in the reflow solder process, thus reducing assembly cost.

In addition, a complete range of accessories such as clinch nut, spacers, board locks, female screw lock, etc. are available. For ***blind mating feature***, a specific high performance solution has been developed based on the combination of a floating plate and guiding pins providing up to 2.2 mm realignment capability. With all these accessories, the requirements of most applications are achievable and it makes this product range very attractive thanks to its versatility, reliability and cost effectiveness.

This blind mating concept is also achievable on the standard D as shown on the photo.



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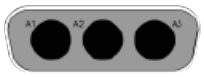
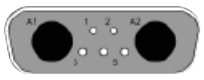
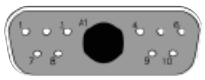
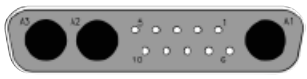
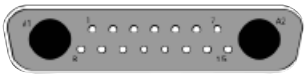
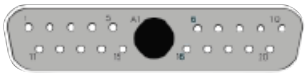
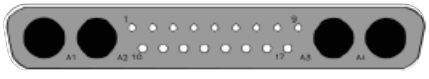
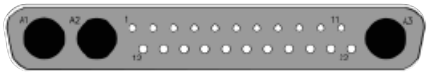
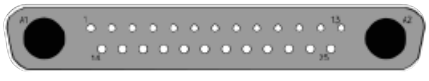
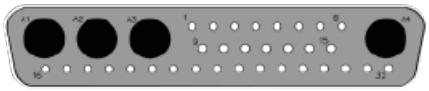
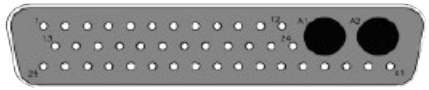
## Contact arrangements

The table shows the standard range supported by HARTING. Two versions are special since they allow to mix in the same shell male and female contacts: 2W2C and 3W3C. The purpose of these versions is to have a 100 % mating proof feature (the insulator shape prevents a 180° reversed mating).

The structure of the connectors' identification is so that the left side digits give the total number of contacts and the right side digits the number of special contacts which can be either power, coaxial or high voltage style.
Example: 13W3 stands for 13 contacts in total with 10 signal contacts and 3 special contacts.

| | Shell size | |
|---|---|---|
| **2W2** | 1 | |
| **2W2C** | 1 | |
| **5W1** | 1 | |
| **3W3** | 2 |  |
| **3W3C** | 2 | |
| **7W2** | 2 |  |
| **11W1** | 2 |  |
| **5W5** | 3 | |
| **9W4** | 3 | |
| **13W3** | 3 |  |
| **17W2** | 3 |  |
| **21W1** | 3 |  |

| | Shell size | |
|---|---|---|
| **7W7** | 4 | |
| **8W8** | 4 | |
| **13W6** | 4 | |
| **21WA4** | 4 |  |
| **25W3** | 4 |  |
| **27W2** | 4 |  |
| **24W7** | 5 | |
| **36W4** | 5 |  |
| **43W2** | 5 |  |

Note:
for any other layout please consult your HARTING representative.





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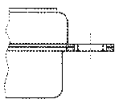
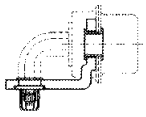
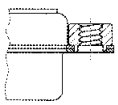
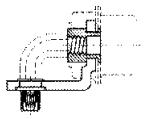
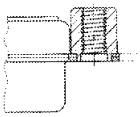
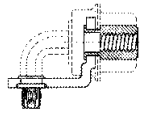
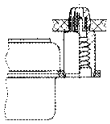
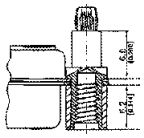
## Connectors for pcb applications – general information

The range of pcb connectors available at HARTING is summarised in the table under. For each of the basic connector versions, the available contact styles are documented with termination process, pitch, plating, rating for power contacts and impedance for coaxial contact etc..., as well as the accessory configuration.

**Pcb connectors are delivered fully loaded** thus providing a very good positioning of the contacts in their cavities for an easy and safe insertion of the pins in the pcb holes particularly crucial in the right angled versions.

Due to the numerous possibilities offered with the pcb connectors, suggested method is to contact your local HARTING representative to determine the part number to order; see customer request form on pages 05.88 and 05.89.



| | Straight | | Right angled | |
|---|---|---|---|---|
| **Insulator body** | • Standard<br>• SMC: Solder Reflow Compatible | | • Standard<br>• SMC: Solder Reflow Compatible | |
| **Signal contacts** | **Solder termination**<br>• Pitch: 2.84 mm<br>• Plating: 0.76 µm Au over Ni<br>• Pcb thickness from 1.6 to 3.2 mm | | **Solder termination**<br>• Pitch: 2.54 mm<br>• Plating: 0.76 µm Au over Ni<br>• Pcb thickness from 1.6 to 3.2 mm | |
| **Power contacts** | **Solder termination**<br>• Rating: 20, 30, 40 A<br>• Plating: 0.76 µm Au over Ni<br><br>**Press-in termination**<br>• Rating: 30 A<br>• Plating: 0.76 µm Au over Ni | | **Solder termination**<br>• Rating: 20, 30, 40 A<br>• Plating: 0.76 µm Au over Ni | |
| **Coaxial contacts** | **Solder termination**<br>• 50 or 75 Ω<br>• Plating:<br>1.3 µm Au over Ni inner conductor<br>0.76 µm Au over Ni outer ring | | **Solder termination**<br>• 50 or 75 Ω<br>• Plating:<br>1.3 µm Au over Ni inner conductor<br>0.76 µm Au over Ni outer ring | |
| **Accessories** | Through hole |  | Metal bracket with board lock and through hole |  |
| | Nut:<br>M3 or UNC 4-40 |  | Metal bracket with board lock and clinch nut M3 or UNC 4-40 |  |
| | Spacer:<br>M3 or UNC 4-40 |  | Metal bracket with board lock and female screw lock UNC 4-40 |  |
| | Spacer<br>(M3 or UNC 4-40)<br>with board lock |  | | |
| | Spacer<br>+ board lock<br>+ female screw lock<br>M3 or UNC 4-40 |  | | |



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## Connectors for cable applications – general information

**Two termination processes are available: crimp or solder**

| | | |
|---|---|---|
| **Shell** | | |
| **Signal contacts** | **Crimp termination**<br>● For wire gauge: AWG 20-24 or 26-28<br>● Plating: 0.76 µm or 0.2 µm Au over Ni | **Pre-mounted solder cup contacts**<br>● Plating: 0.76 µm or 0.1 µm Au over Ni |
| **Power contacts** | **Crimp**<br>● Rating: 10, 20, 30, 40 A<br>● Plating:<br>Mating side 0.76 µm or 0.2 µm Au<br>Terminating side 0.2 µm Au<br><br>**Solder cup**<br>● Rating: 10, 20, 30, 40 A<br>● Plating:<br>Mating side 0.76 µm or 0.2 µm Au<br>Terminating side 0.2 µm Au or 5 µm Sn | **Crimp**<br>● Rating: 10, 20, 30, 40 A<br>● Plating:<br>Mating side 0.76 µm or 0.2 µm Au<br>Terminating side 0.2 µm Au<br><br>**Solder cup**<br>● Rating: 10, 20, 30, 40 A<br>● Plating:<br>Mating side 0.76 µm or 0.2 µm Au<br>Terminating side 0.2 µm Au or 5 µm Sn |
| **Coaxial contacts**[1)] | **Solder/crimp termination resp. Crimp/crimp termination**<br>● 50 or 75 Ω<br>● Plating:<br>Mating side 1.3 µm or 0.2 µm Au inner conductor<br>0.76 µm or 0.2 µm Au outer ring<br>Terminating side 1.3 µm or 0.2 µm Au inner conductor<br>0.2 µm Au or 5 µm Sn outer ring<br>Ferrule 0.2 µm Au or 5 µm Sn<br>● Cables: RG 178, 179 … | **Solder/crimp termination resp. Crimp/crimp termination**<br>● 50 or 75 Ω<br>● Plating:<br>Mating side 1.3 µm or 0.2 µm Au inner conductor<br>0.76 µm or 0.2 µm Au outer ring<br>Terminating side 1.3 µm or 0.2 µm Au inner conductor<br>0.2 µm Au or 5 µm Sn outer ring<br>Ferrule 0.2 µm Au or 5 µm Sn<br>● Cables: RG 178, 179 … |
| **High voltage contacts** | **Solder termination**<br>● Plating:<br>1.3 µm Au over Ni terminating and mating side | **Solder termination**<br>● Plating:<br>1.3 µm Au over Ni terminating and mating side |

[1)] Coaxial contacts are provided in two versions:
- Inner conductor soldered and outer part crimped (solder/crimp termination)
- Both inner and outer part crimped (crimp/crimp termination); this version is recommended for medium or large size volume since crimping is faster than soldering.



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| | |
|---|---|
| Number of contacts | 2, 3, 5, 7, 8, 9, 11, 13, 17, 21, 24, 25, 27, 36, 43 |
| Approvals | DIN 41652, part 1 |
| Working current | 5 A for signal contacts |
| Temperature range<br>The higher temperature limit includes the ambient and heating effect of the contacts under load | -55 °C … +125 °C |
| Materials | |
| Mouldings | Thermoplastic resin, glass-fibre filled (Polyester)<br>UL 94-V0<br>color: green for standard<br>black for crimp |
| Metal shell | Tin plated steel |

Technical characteristics for special contacts see page 05.69



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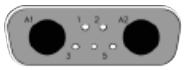
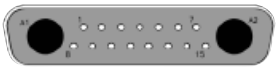
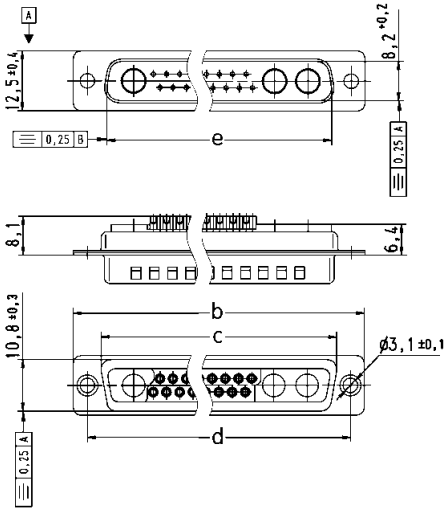
Number of contacts

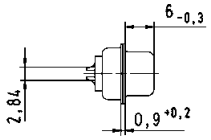
# 7–27

## Mixed shells with pre-mounted signal solder cup contacts

| Identification | No. of contacts[1] | Part number | | | |
|---|---|---|---|---|---|
| | | male connectors | | female connectors | |
| | | Performance level 3 | S4[2] | Performance level 3 | S4[2] |
|  | 7W2 | 09 69 211 7072 | 09 69 211 5072 | 09 69 201 7072 | 09 69 201 5072 |
|  | 17W2 | 09 69 311 7172 | 09 69 311 5172 | 09 69 301 7172 | 09 69 301 5172 |
| | 21WA4 | 09 69 411 7214 | 09 69 411 5214 | 09 69 401 7214 | 09 69 401 5214 |
| | 27W2 | 09 69 411 7272 | 09 69 411 5272 | 09 69 401 7272 | 09 69 401 5272 |

### Male connectors

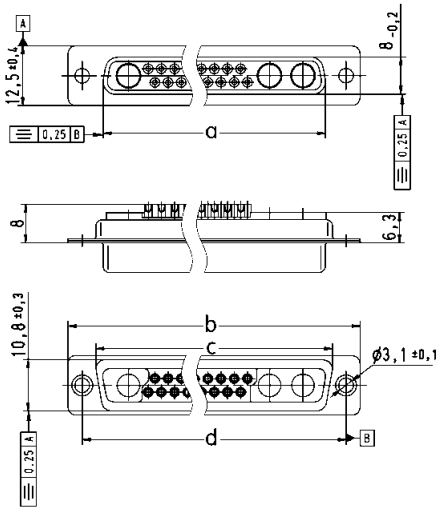


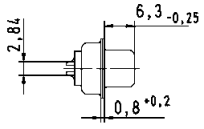




Solder cup termination for AWG 20 (0.5 mm²)

| | a | b | c | d | e |
|---|---|---|---|---|---|
| 7W2 | 24.6 | 39.1 | 27.5 | 33.30 | 25.2 |
| 17W2 | 38.3 | 53.0 | 41.3 | 47.04 | 38.9 |
| 21WA4 | 54.8 | 69.3 | 57.7 | 63.50 | 55.3 |
| 27W2 | 54.9 | 69.3 | 57.7 | 63.50 | 55.3 |

### Female connectors




Solder cup termination for AWG 20 (0.5 mm²)

Dimensions in mm

[1] Explanations see page 05.51
[2] S4 = 0.76 µm Au or PdNi equivalent

Board drillings see pages 05.78 ff
Order special contacts separately. See pages 05.69 ff





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Number of contacts

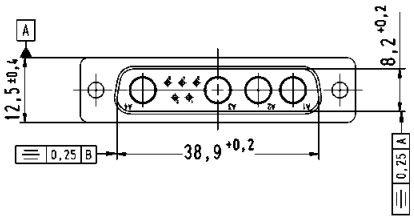
# 9–25

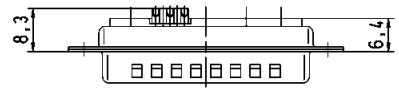
## Mixed shells with pre-mounted signal solder cup contacts

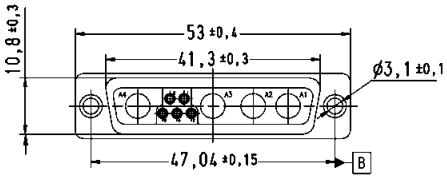
| Identification | No. of contacts[1] | Part number | | | |
|---|---|---|---|---|---|
| | | male connectors | | female connectors | |
| | | Performance level 3 | S4[2] | Performance level 3 | S4[2] |
| | 9W4 | 09 69 311 7094 | 09 69 311 5094 | 09 69 301 7094 | 09 69 301 5094 |
| | 13W3 | 09 69 311 7133 | 09 69 311 5133 | 09 69 301 7133 | 09 69 301 5133 |
| | 25W3 | 09 69 411 7253 | 09 69 411 5253 | 09 69 401 7253 | 09 69 401 5253 |

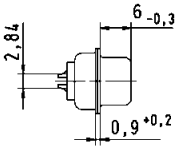
### Male connectors

9W4



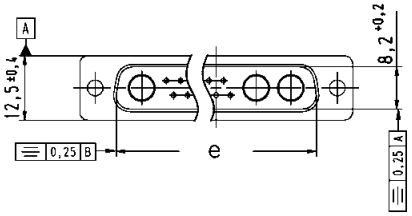



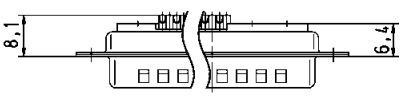



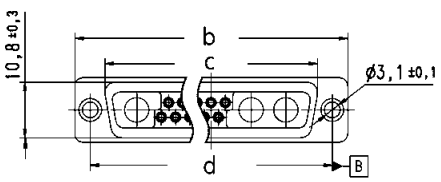



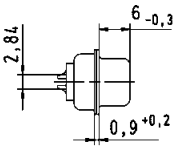

Solder cup termination for AWG 20 (0.5 mm²)

13W3, 25W3




Solder cup termination for AWG 20 (0.5 mm²)

| | b | c | d | e |
|---|---|---|---|---|
| 13W3 | 53.0 | 41.3 | 47.04 | 38.90 |
| 25W3 | 69.3 | 57.7 | 63.50 | 49.84 |

Dimensions in mm

[1] Explanations see page 05.51
[2] S4 = 0.76 µm Au or PdNi equivalent
Board drillings see pages 05.78 ff

Drawings for female connectors see page 05.57
Order special contacts separately. See pages 05.69 ff



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Number of contacts

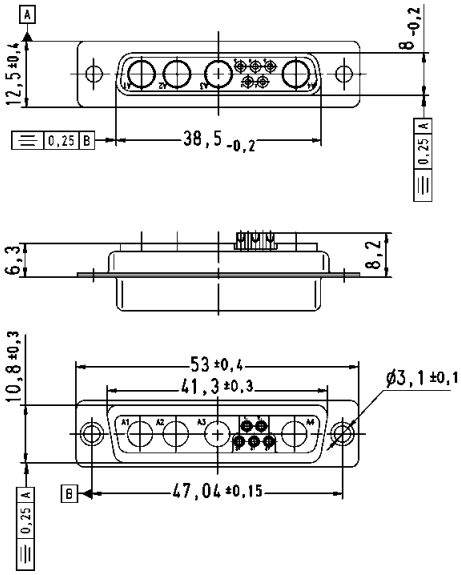
# 9–25

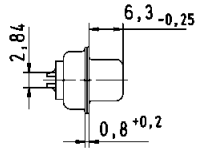
## Mixed shells with pre-mounted signal solder cup contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|

Female connectors

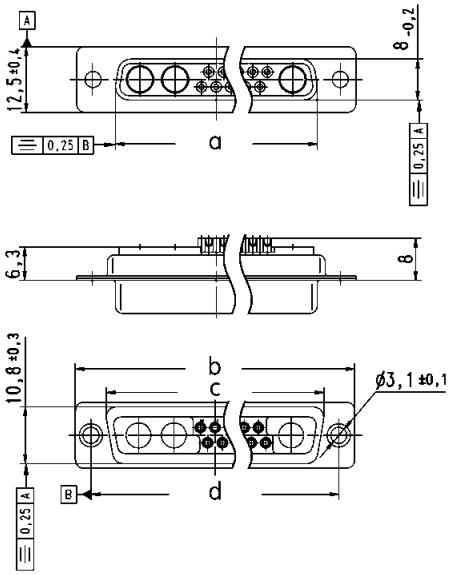
9W4

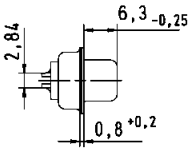



Solder cup termination for AWG 20 (0.5 mm²)

13W3, 25W3




Solder cup termination for AWG 20 (0.5 mm²)

| | a | b | c | d |
|---|---|---|---|---|
| 13W3 | 38.3 | 53.0 | 41.3 | 47.04 |
| 25W3 | 54.9 | 69.3 | 57.7 | 63.50 |

Board drillings see pages 05.78 ff





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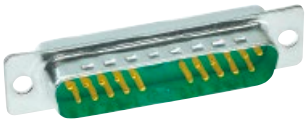
Number of contacts

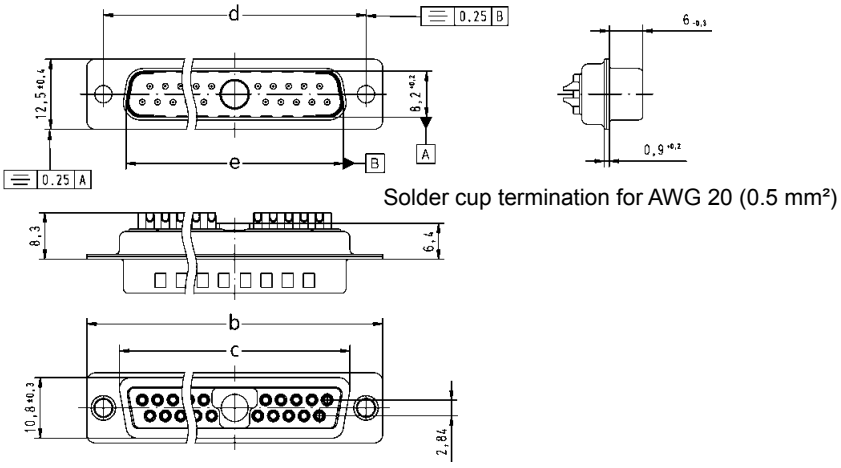
# 5–21



## Mixed shells with pre-mounted signal solder cup contacts

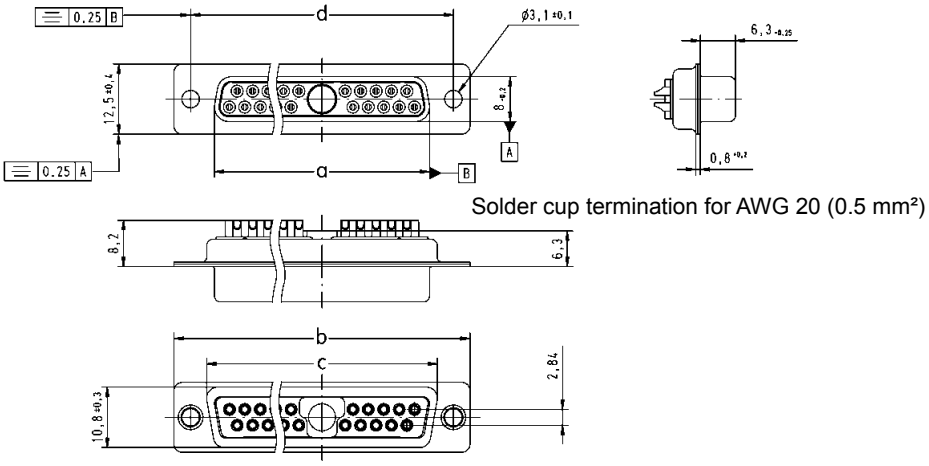
| Identification | No. of contacts[1] | Part number | | | |
|---|---|---|---|---|---|
| | | male connectors | | female connectors | |
| | | Performance level 3 | S4[2] | Performance level 3 | S4[2] |
| | 5W1 | 09 69 111 7051 | 09 69 111 5051 | 09 69 101 7051 | 09 69 101 5051 |
| | 11W1 | 09 69 211 7111 | 09 69 211 5111 | 09 69 201 7111 | 09 69 201 5111 |
| | 21W1 | 09 69 311 7211 | 09 69 311 5211 | 09 69 301 7211 | 09 69 301 5211 |

### Male connectors




Solder cup termination for AWG 20 (0.5 mm²)

### Female connectors




Solder cup termination for AWG 20 (0.5 mm²)

| | a | b | c | d | e |
|---|---|---|---|---|---|
| 5W1 | 16.4 | 30.8 | 19.3 | 25.00 | 16.9 |
| 11W1 | 24.7 | 39.1 | 27.5 | 33.30 | 25.2 |
| 21W1 | 38.5 | 53.0 | 41.3 | 47.04 | 38.9 |

Dimensions in mm

[1] Explanations see page 05.51
[2] S4 = 0.76 µm Au or PdNi equivalent
Board drillings see pages 05.78 ff

Order special contacts separately. See pages 05.69 ff



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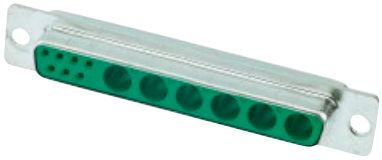
Number of contacts

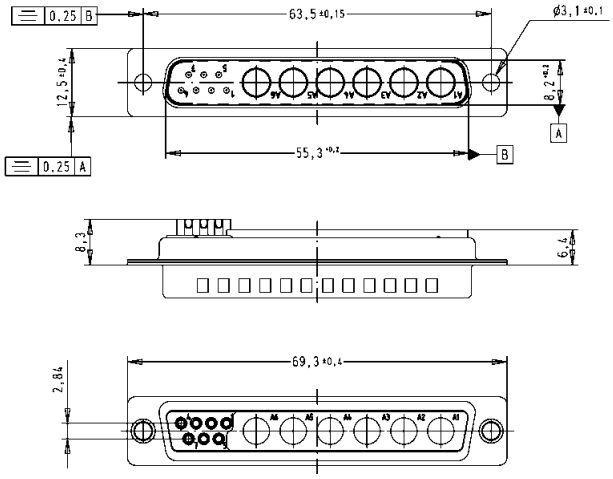
# 13

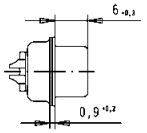


## Mixed shells with pre-mounted signal solder cup contacts

| Identification | No. of contacts[1] | Part number | | | |
|---|---|---|---|---|---|
| | | male connectors | | female connectors | |
| | | Performance level 3 | S4[2] | Performance level 3 | S4[2] |
| | 13W6 | 09 69 411 7136 | 09 69 411 5136 | 09 69 401 7136 | 09 69 401 5136 |

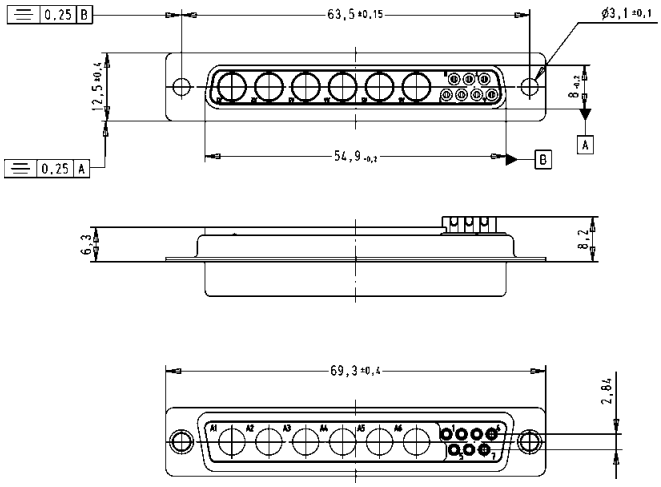
### Male connectors

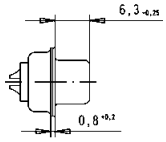



Solder cup termination for AWG 20 (0.5 mm²)

### Female connectors




Solder cup termination for AWG 20 (0.5 mm²)

Dimensions in mm

[1] Explanations see page 05.51
[2] S4 = 0.76 µm Au or PdNi equivalent
Board drillings see pages 05.78 ff

Order special contacts separately. See pages 05.69 ff



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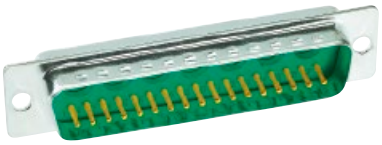
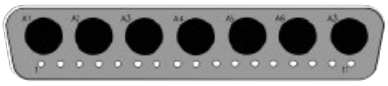
Number of contacts

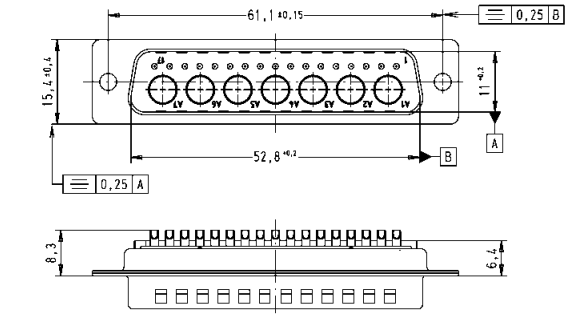
# 24

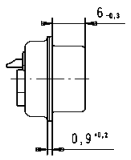


## Mixed shells with pre-mounted signal solder cup contacts

| Identification | No. of contacts[1] | Part number | | | |
|---|---|---|---|---|---|
| | | male connectors | | female connectors | |
| | | Performance level 3 | S4[2] | Performance level 3 | S4[2] |
|  | 24W7 | 09 69 511 7247 | 09 69 511 5247 | 09 69 501 7247 | 09 69 501 5247 |

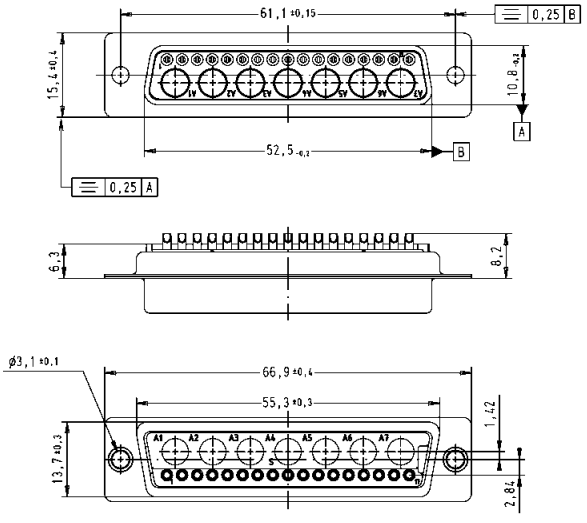
### Male connectors

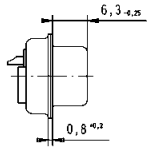



Solder cup termination for AWG 20 (0.5 mm²)

### Female connectors




Solder cup termination for AWG 20 (0.5 mm²)

Dimensions in mm

[1] Explanations see page 05.51
[2] S4 = 0.76 µm Au or PdNi equivalent
Board drillings see pages 05.78 ff

Order special contacts separately. See pages 05.69 ff



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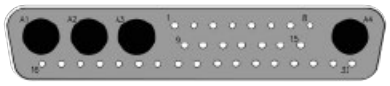
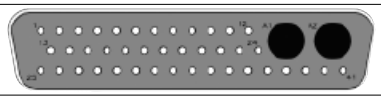
Number of contacts

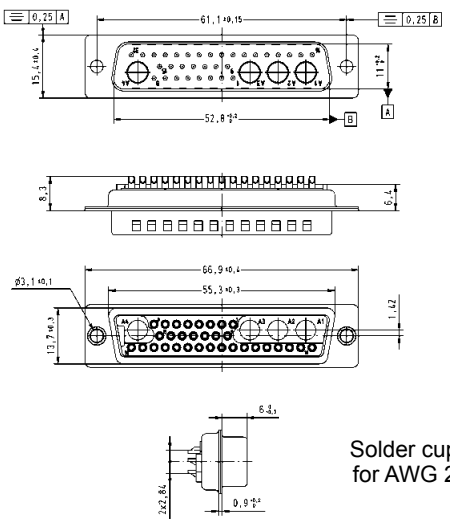
# 36–43

## Mixed shells with pre-mounted signal solder cup contacts

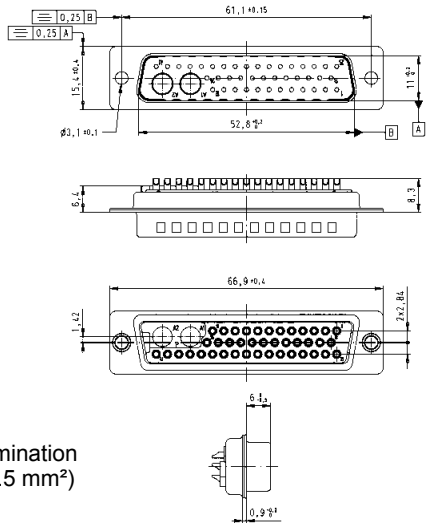
| Identification | No. of contacts[1] | Part number | | | |
|---|---|---|---|---|---|
| | | male connectors | | female connectors | |
| | | Performance level 3 | S4[2] | Performance level 3 | S4[2] |
|  | 36W4 | 09 69 511 7364 | 09 69 511 5364 | 09 69 501 7364 | 09 69 501 5364 |
|  | 43W2 | 09 69 511 7432 | 09 69 511 5432 | 09 69 501 7432 | 09 69 501 5432 |

Male connectors

36W4

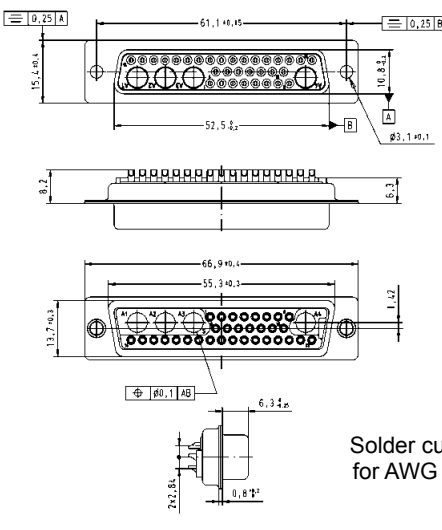


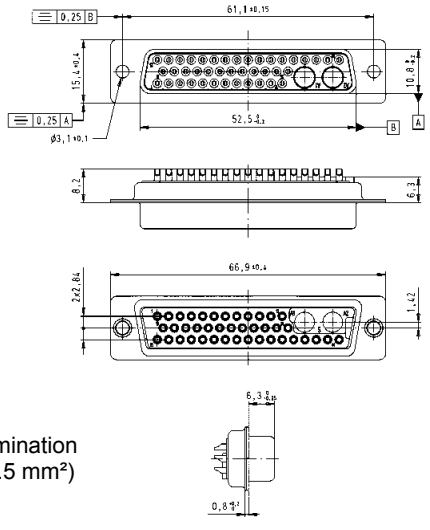
43W2



Solder cup termination for AWG 20 (0.5 mm²)

Female connectors





Solder cup termination for AWG 20 (0.5 mm²)

Dimensions in mm

[1] Explanations see page 05.51
[2] S4 = 0.76 µm Au or PdNi equivalent
Board drillings see pages 05.78 ff

Order special contacts separately. See pages 05.69 ff





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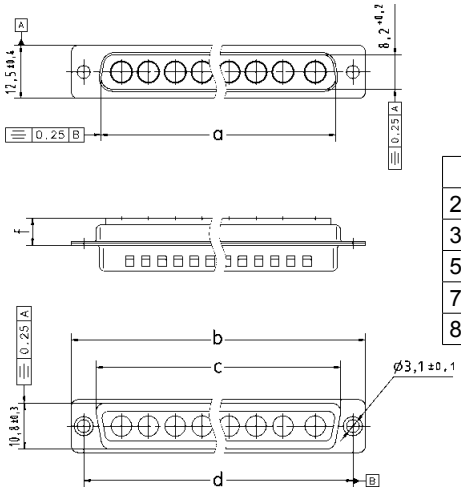
Number of contacts

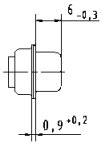
# 2–8

## Shells without signal contacts for cable applications

| Identification | No. of contacts[1)] | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| | 2W2 | 09 69 110 0522 | 09 69 100 0522 |
| | 3W3 | 09 69 210 0033 | 09 69 200 0033 |
| | 5W5 | 09 69 310 0055 | 09 69 300 0055 |
| | 7W7 | 09 69 410 0077 | 09 69 400 0077 |
| | 8W8 | 09 69 410 0088 | 09 69 400 0088 |

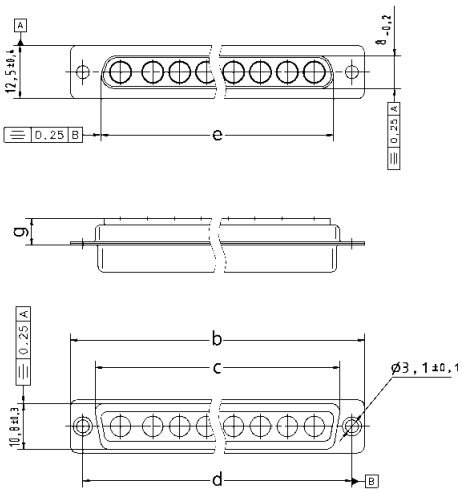
### Male connectors

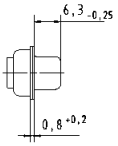



| | a | b | c | d | e | f | g |
|---|---|---|---|---|---|---|---|
| 2W2 | 16.9 | 30.8 | – | 25.00 | 16.4 | 8.7 | 8.6 |
| 3W3 | 25.2 | 39.1 | 27.5 | 33.30 | 24.6 | 6.4 | 6.3 |
| 5W5 | 38.9 | 53.0 | 41.3 | 47.04 | 38.3 | 6.4 | 6.3 |
| 7W7 | 55.3 | 69.3 | 57.7 | 63.50 | 54.9 | 6.4 | 6.3 |
| 8W8 | 55.3 | 69.3 | 57.7 | 63.50 | 54.8 | 6.4 | 6.3 |

### Female connectors




Dimensions in mm

[1)] Explanations see page 05.51
Board drillings see pages 05.78 ff
Order special contacts separately. See pages 05.69 ff



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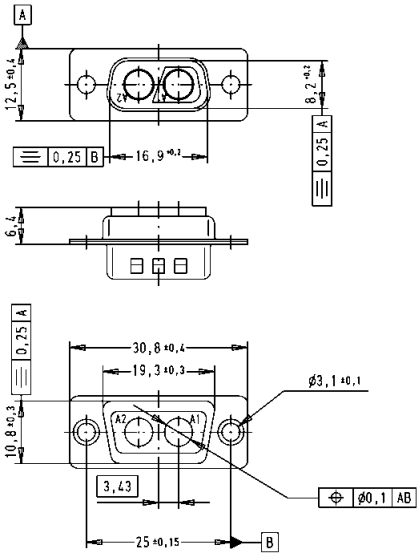
Number of contacts

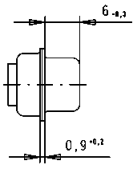
# 2

## Coded shells without signal contacts for cable applications

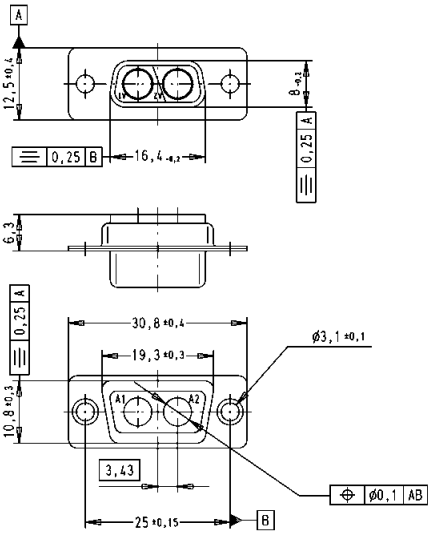
| Identification | No. of contacts[1)] | Part number | |
|---|---|---|---|
| | | male connector | female connector |
| | 2W2C | 09 69 110 0022 | 09 69 100 0022 |

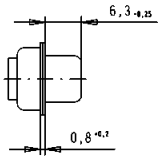
Male connectors




Female connectors




Dimensions in mm

[1)] Explanations see page 05.51
Board drillings see pages 05.78 ff
Order special contacts separately. See pages 05.69 ff





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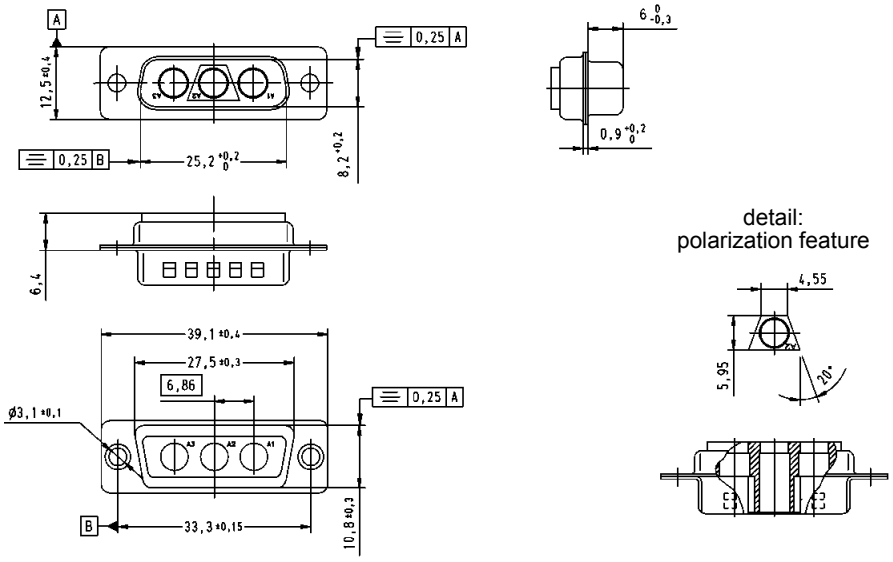
Number of contacts

# 3

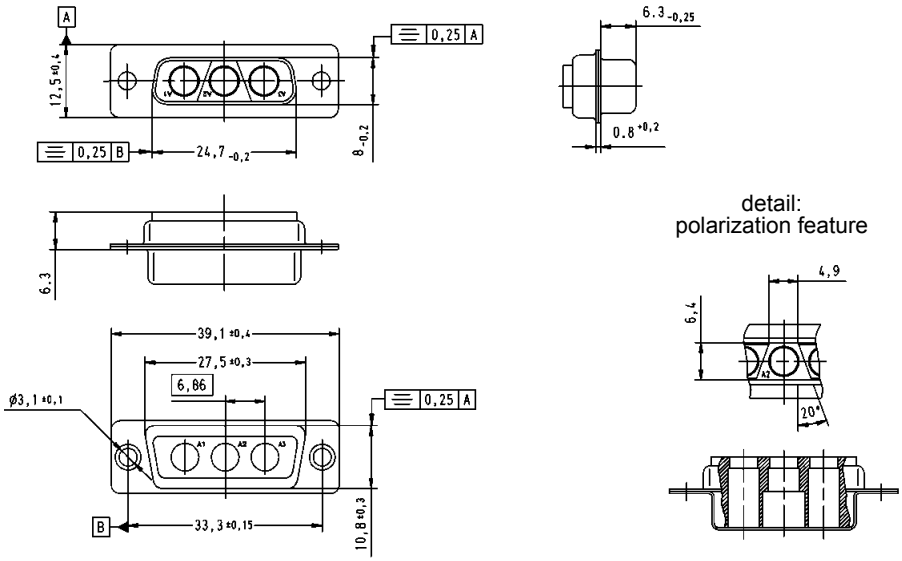
## Coded shells without signal contacts for cable applications

| Identification | No. of contacts[1] | Part number | |
|---|---|---|---|
| | | male connector | female connector |
| | 3W3C | 09 69 210 0633 | 09 69 200 0633 |

Male connectors




Female connectors




Dimensions in mm

[1] Explanations see page 05.51
Board drillings see pages 05.78 ff
Order special contacts separately. See pages 05.69 ff



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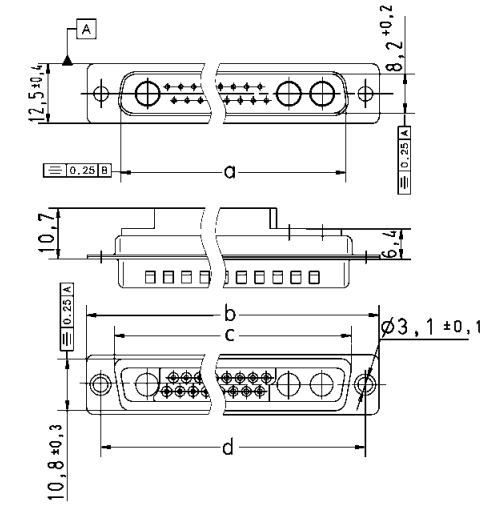
Number of contacts

# 7–27

## Mixed shells for signal crimp contacts

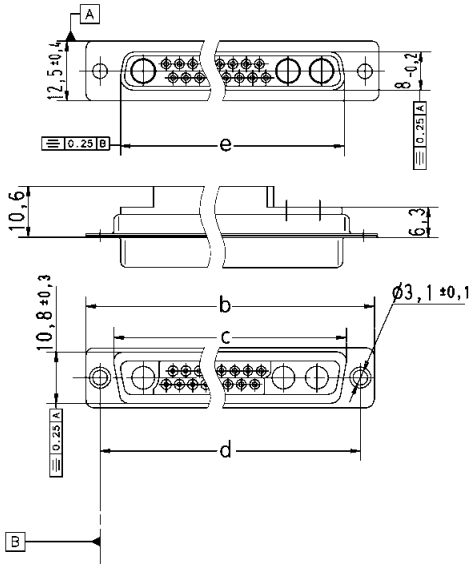
| Identification | No. of contacts[1)] | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| | 7W2 | 09 69 212 0072 | 09 69 202 0072 |
| | 17W2 | 09 69 312 0172 | 09 69 302 0172 |
| | 21WA4 | 09 69 412 0214 | 09 69 402 0214 |
| | 27W2 | 09 69 412 0272 | 09 69 402 0272 |

### Male connectors




| | a | b | c | d | e |
|---|---|---|---|---|---|
| 7W2 | 25.2 | 39.1 | 27.5 | 33.30 | 24.7 |
| 17W2 | 38.9 | 53.0 | 41.3 | 47.04 | 38.5 |
| 21WA4 | 55.3 | 69.3 | 57.7 | 63.50 | 54.9 |
| 27W2 | 56.3 | 69.3 | – | 63.50 | 54.9 |

### Female connectors




Dimensions in mm

[1)] Explanations see page 05.51
Board drillings see pages 05.78 ff
Order special contacts separately. See pages 05.69 ff



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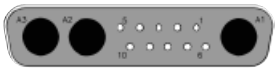
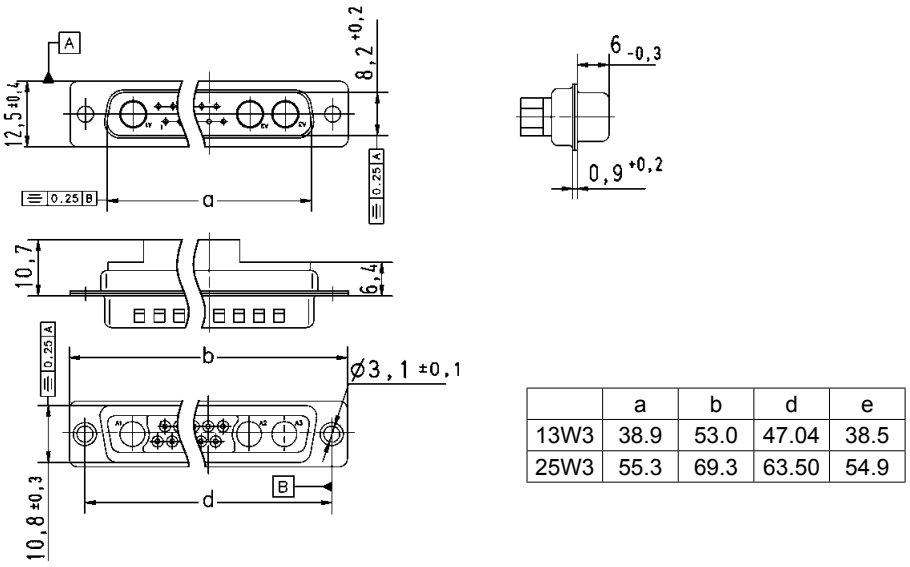
Number of contacts

# 13–25

## Mixed shells for signal crimp contacts

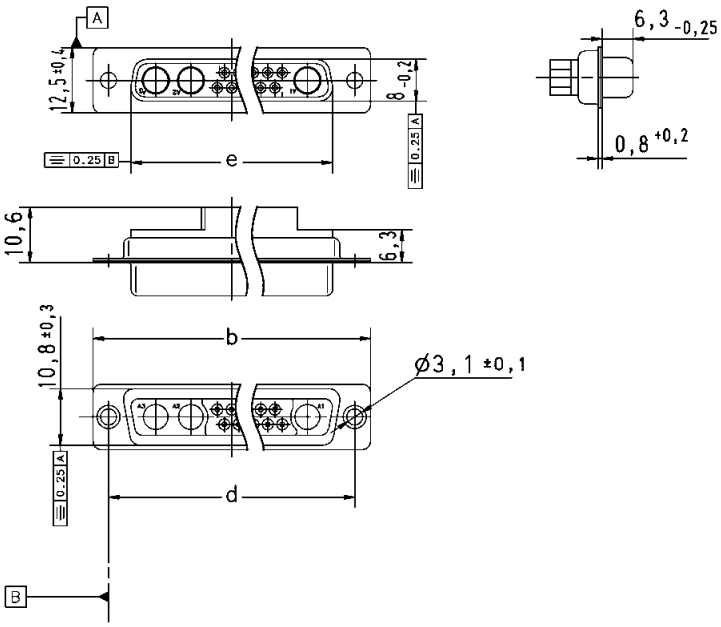
| Identification | No. of contacts[1] | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
|  | 13W3 | 09 69 312 0133 | 09 69 302 0133 |
| | 25W3 | 09 69 412 0253 | 09 69 402 0253 |

### Male connectors




| | a | b | d | e |
|---|---|---|---|---|
| 13W3 | 38.9 | 53.0 | 47.04 | 38.5 |
| 25W3 | 55.3 | 69.3 | 63.50 | 54.9 |

### Female connectors




Dimensions in mm

[1] Explanations see page 05.51
Board drillings see pages 05.78 ff
Order special contacts separately. See pages 05.69 ff



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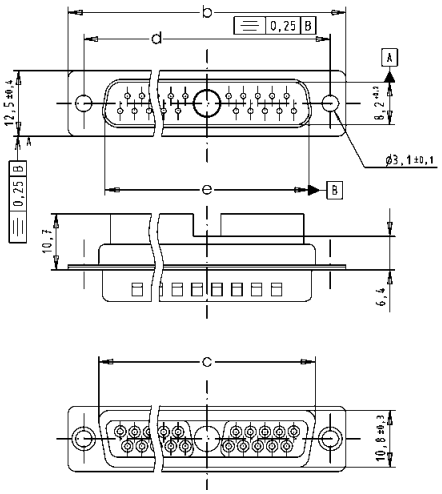
Number of contacts

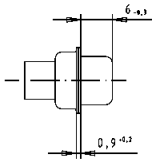
# 11–21

## Mixed shells for signal crimp contacts

| Identification | No. of contacts[1)] | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| | 11W1 | 09 69 212 0111 | 09 69 202 0111 |
| | 21W1 | 09 69 312 0211 | 09 69 302 0211 |

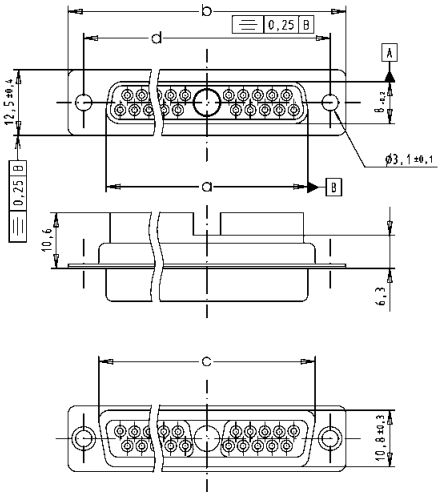
### Male connectors

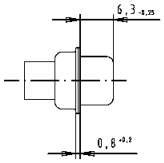



| | a | b | c | d | e |
|---|---|---|---|---|---|
| 11W1 | 24.7 | 39.1 | 27.5 | 33.30 | 25.2 |
| 21W1 | 38.5 | 53.0 | 41.3 | 47.04 | 38.9 |

### Female connectors




Dimensions in mm



[1)] Explanations see page 05.51
Order special contacts separately. See pages 05.69 ff
Board drillings see pages 05.78 ff

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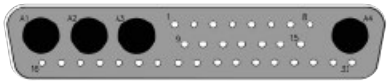
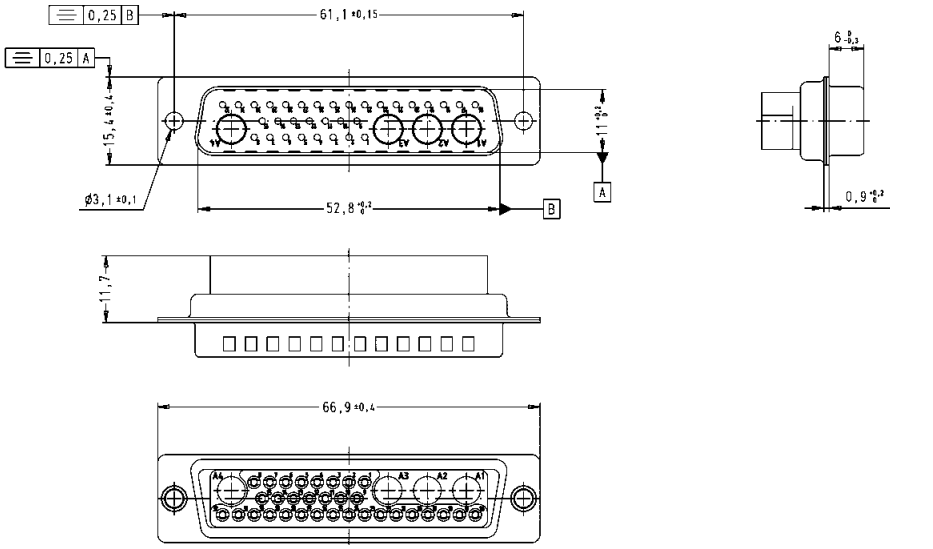
Number of contacts

# 36

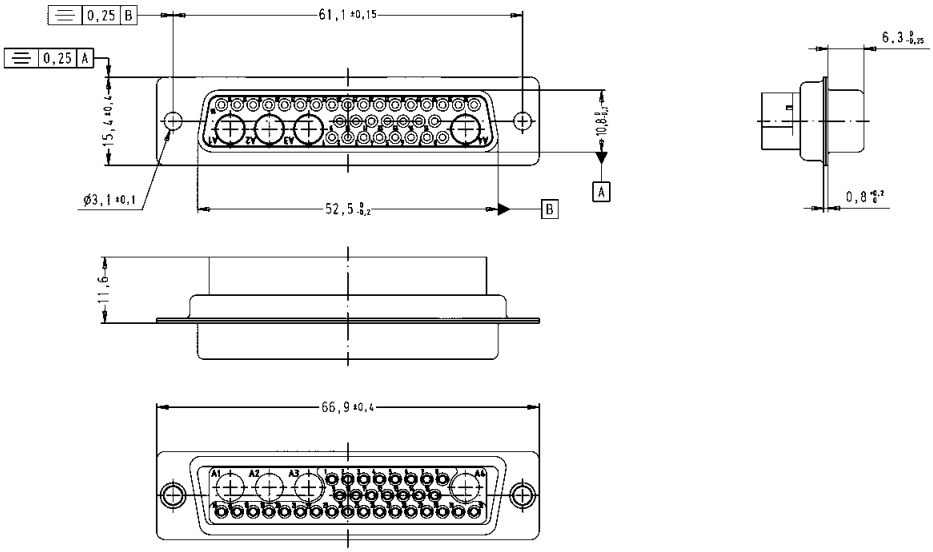
## Mixed shells for signal crimp contacts

| Identification | No. of contacts[1] | Part number | |
|---|---|---|---|
| | | male connector | female connector |
|  | 36W4 | 09 69 512 0364 | 09 69 502 0364 |

### Male connectors




### Female connectors




Dimensions in mm

[1] Explanations see page 05.51
Board drillings see pages 05.78 ff
Order special contacts separately. See pages 05.69 ff



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| | Signal contacts see page 05.70 | Coaxial contacts see pages 05.74 – 05.76 | Power contacts see pages 05.72 + 05.73 | High voltage contacts see page 05.71 | Pneumatic contacts see page 05.77 |
|---|---|---|---|---|---|
| Working current | 5 A | 2 A | 10 A, 20 A, 30 A or 40 A | 10 A DC | – |
| Test voltage $U_{r.m.s.}$ | – | 750 V / 50 Hz | – | 4 kV / 50 Hz | – |
| Operating voltage | – | – | – | ≤ 3 kV | – |
| Contact resistance | – | ≤ 10 mΩ (inner and outer conductor) | ≤ 1 mΩ | ≤ 3 mΩ (outer conductor) | – |
| Impedance | – | 50 / 75 Ω | – | – | – |
| Frequency range | – | 0 - 2 GHz | – | – | – |
| Temperature range | – | -55 °C … +135 °C | -55 °C … +155 °C | -55 °C … +125 °C | -10 °C … +60 °C |
| Mating cycles | | | | | |
| high performance level | ≥ 500 | ≥ 500 | ≥ 500 | – | – |
| standard performance level | – | ≥ 200 | ≥ 200 | ≥ 500 | – |
| Mating force | ≤ 3.4 N | ≤ 7 N/mated pair | ≤ 7 N/mated pair | ≤ 5 N | – |
| Unmating force | ≥ 0.2 N | ≤ 7 N/mated pair | appr. 5 N | appr. 2.5 N | – |
| Max. pressure | – | – | – | – | 7 bars at 20 °C |
| Materials | | | | | |
| Contacts | Copper alloy | Copper alloy | Copper alloy | Copper alloy | German silver |
| Plating for PCB applications* | | | | | |
| Mating side / terminating side | **0.76 µm Au / 0.76 µm Au** | | **0.76 µm Au / 5 µm Sn** or 0.2 µm Au / 5 µm Sn | **1.3 µm Au / 1.3 µm Au** | – |
| Inner conductor mating side / terminating side | – | **1.3 µm Au / 1.3 µm Au** or 0.2 µm Au / 0.2 µm Au | – | – | – |
| Outer conductor mating side / terminating side | – | **0.76 µm Au / 0.2 µm Au** or 0.2 µm Au / 5 µm Sn | – | – | – |
| Retaining clip | – | Copper alloy | Copper alloy | PI | – |
| Insulator | – | PBFE/PBTP/PI | – | PTFE | – |
| O-ring | – | – | – | – | Vitton |

Technical characteristics for shells see page 05.04

* **High performance** or standard performance level





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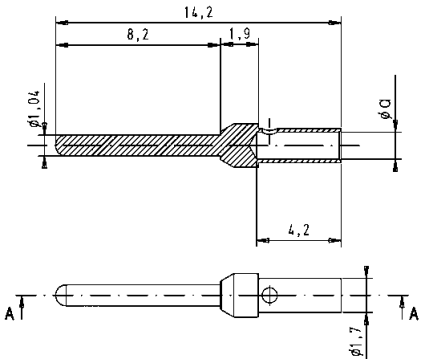
## Turned crimp contacts

| Identification | Wire gauge ($mm^2$) | Part number | | |
|---|---|---|---|---|
| | | Male contacts | Female contacts | High-end female contacts |
| | | Performance level 1* | Performance level 1* | Performance level 1* |
| Individual contacts[1)] | AWG 22-18 0.33-0.82 | 09 67 000 3576 | 09 67 000 3476 | 09 67 000 3676 |
| | AWG 24-20 0.25-0.52 | 09 67 000 8576 | 09 67 000 8476 | 09 67 000 8676 |
| | AWG 26-22 0.13-0.33 | 09 67 000 5576 | 09 67 000 5476 | 09 67 000 5676 |
| | AWG 28-24 0.09-0.25 | 09 67 000 7576 | 09 67 000 7476 | 09 67 000 7676 |

[1)] Minimum order 100 pieces or multiples of 100

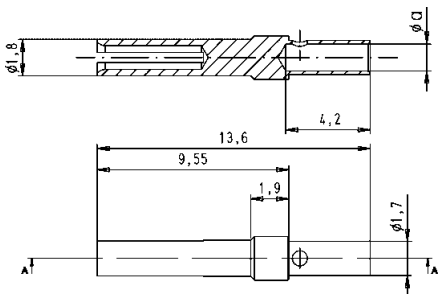
### Male contacts



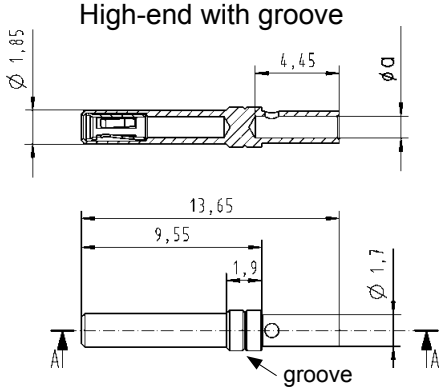

| | a | groove |
|---|---|---|
| AWG 22-18 | 1.34 | none |
| AWG 24-20 | 1.13 | 1 |
| AWG 26-22 | 0.88 | 2 |
| AWG 28-24 | 0.64 | 3 |

### Female contacts

Standard




High-end with groove




* Performance level 1 as per CECC 75301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60512
Use crimp tool with the part no. 09 99 000 0501 and the locator with the part no. 09 99 000 0531. Details see chapter 20



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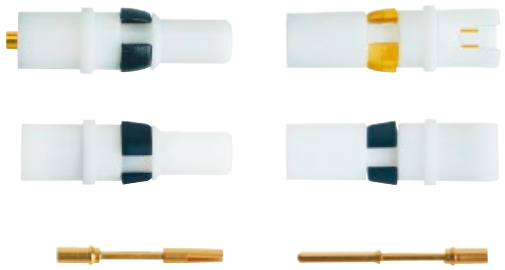


## High voltage contacts for cable applications

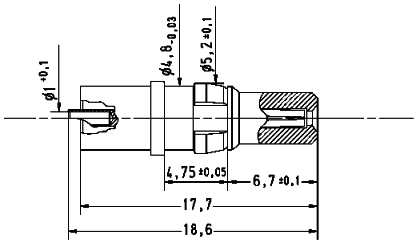
| Identification | Wire gauge (mm²) | Part number | |
|---|---|---|---|
| | | Male contacts Plating: 1.3 µm Au[1] | Female contacts Plating: 1.3 µm Au[1] |
| **Straight versions** | | | |
| with solder termination | AWG 24 - 20 0.25 - 0.56 | 09 69 281 2550 | 09 69 181 2550 |
| with crimp termination[2] | AWG 30 - 24 0.05 - 0.25 | 09 69 282 2550 | 09 69 182 2550 |
| **Right angled versions** | | | |
| with solder termination | AWG 24 - 20 0.25 - 0.56 | 09 69 681 2550 | 09 69 581 2550 |

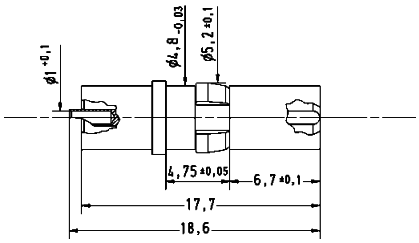
Male contacts

Female contacts

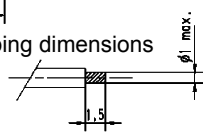
**Straight versions**

with solder termination

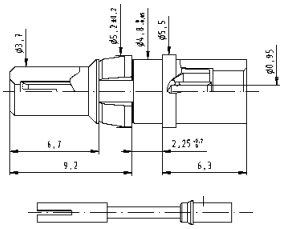


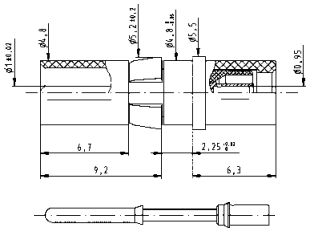




stripping dimensions



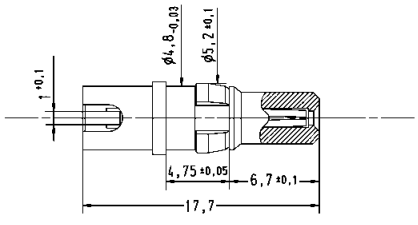

with crimp termination[2]

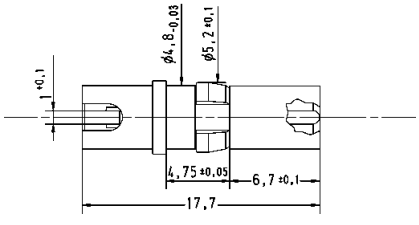




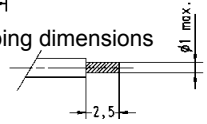
**Right angled versions**

with solder termination




stripping dimensions




Dimensions in mm

[1] for mating and terminating side
[2] Tooling see chapter 20



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## Straight power contacts for cable applications

| Identification | Rating (A) | Part number | |
|---|---|---|---|
| Performance levels ▶ | | Performance level 3 | S4[1] |
| **Solder version** | | | |
| Male contacts | 10 | 09 69 281 7420 | 09 69 281 5420 |
| | 20 | 09 69 281 7421 | 09 69 281 5421 |
| | 30 | 09 69 281 7422 | 09 69 281 5422 |
| | 40 | 09 69 281 7423 | 09 69 281 5423 |
| **Short** male contacts | 20 | 09 69 281 7821 | 09 69 281 5821 |
| | 40 | 09 69 281 7823 | 09 69 281 5823 |
| Female contacts | 10 | 09 69 181 7420 | 09 69 181 5420 |
| | 20 | 09 69 181 7421 | 09 69 181 5421 |
| | 30 | 09 69 181 7422 | 09 69 181 5422 |
| | 40 | 09 69 181 7423 | 09 69 181 5423 |
| **Short** female contacts | 20 | 09 69 181 7821 | 09 69 181 5821 |
| | 40 | 09 69 181 7823 | 09 69 181 5823 |
| **Crimp version**[2] | | | |
| Male contacts | 10 | 09 69 282 7420 | 09 69 282 5420 |
| | 20 | 09 69 282 7421 | 09 69 282 5421 |
| | 30 | 09 69 282 7422 | 09 69 282 5422 |
| | 40 | 09 69 282 7423 | 09 69 282 5423 |
| **Short** male contacts | 20 | 09 69 282 7821 | 09 69 282 5821 |
| | 40 | 09 69 282 7823 | 09 69 282 5823 |
| Female contacts | 10 | 09 69 182 7420 | 09 69 182 5420 |
| | 20 | 09 69 182 7421 | 09 69 182 5421 |
| | 30 | 09 69 182 7422 | 09 69 182 5422 |
| | 40 | 09 69 182 7423 | 09 69 182 5423 |
| **Short** female contacts | 20 | 09 69 182 7821 | 09 69 182 5821 |
| | 40 | 09 69 182 7823 | 09 69 182 5823 |

[1] S4 = 0.76 µm Au or PdNi equivalent
[2] Tooling see chapter 20

Dimensions see page 05.73



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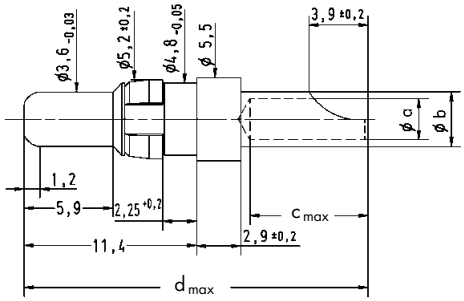
## Straight power contacts for cable applications

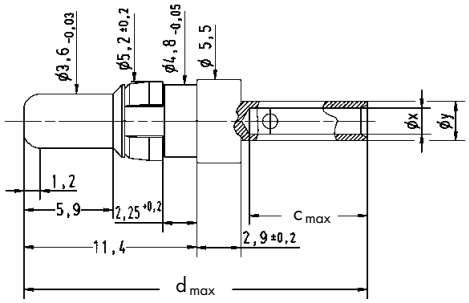
| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Male contacts

solder




crimp

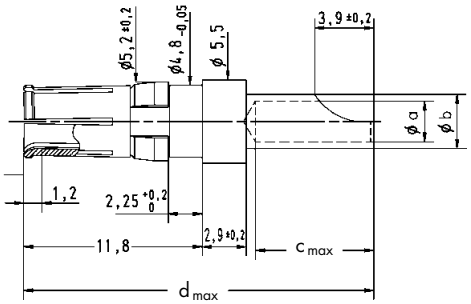



| | Rating (A) | ø a -0.1 | ø b ±0.05 | $c_{max}$ | $d_{max}$ | e | ø x -0.1 | ø y ±0.05 | AWG |
|---|---|---|---|---|---|---|---|---|---|
| | 10 | 1.8 | 2.54 | 7.8 | 23 | 7.5 | 1.7 | 2.6 | 16 - 20 |
| | 20 | 2.7 | 3.63 | 7.8 | 23 | 7.5 | 2.6 | 3.6 | 12 - 14 |
| short version | 20 | 2.7 | 3.63 | 4.7 | 17.4 | 4.5 | 2.6 | 3.6 | 12 - 14 |
| | 30 | 3.5 | 4.40 | 7.8 | 23 | 7.5 | 3.7 | 4.7 | 10 - 12 |
| | 40 | 4.8 | 5.50 | 7.8 | 23 | 7.5 | 4.6 | 5.8 | 8 - 10 |
| short version | 40 | 4.8 | 5.50 | 6.4 | 20 | 6.1 | 4.6 | 5.8 | 8 - 10 |

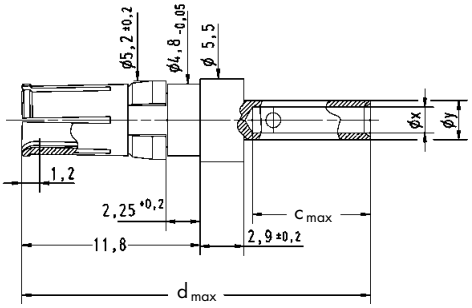
| | Rating (A) | min./max. conductor ø | min./max. conductor cross section [mm²] |
|---|---|---|---|
| | 10 | 0.9 to 1.7 | 0.64 to 2.27 |
| | 20 | 1.8 to 2.6 | 2.54 to 5.31 |
| short version | 20 | 1.8 to 2.6 | 2.54 to 5.31 |
| | 30 | 2.2 to 3.7 | 3.80 to 10.75 |
| | 40 | 2.9 to 4.6 | 6.61 to 16.62 |
| short version | 40 | 2.9 to 4.6 | 6.61 to 16.62 |

### Female contacts

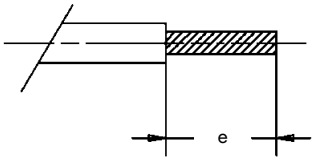
solder




crimp




stripping dimensions for male and female contacts





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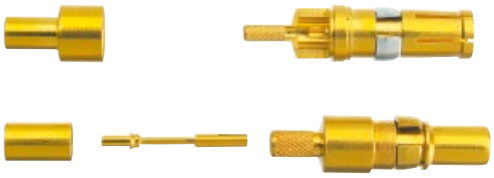
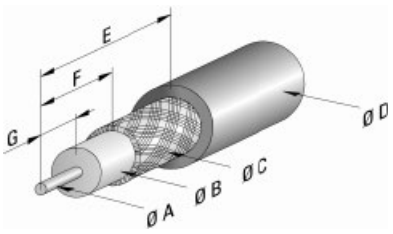


## Coaxial contacts for cable applications

| Identification | Impedance (Ω) | Part number | | | |
|---|---|---|---|---|---|
| | | Straight male contacts | | Straight female contacts | |
| | | Performance level 3 | S4[1)] | Performance level 3 | S4[1)] |
| **Solder / crimp contact** | | | | | |
| for cables RG 174 U, 188 AU, 316 U | 50 | 09 69 281 7140 | 09 69 281 5140 | 09 69 181 7140 | 09 69 181 5140 |
| for cables RG 178 BU, 196 AU, 404 U | 50 | 09 69 281 7141 | 09 69 281 5141 | 09 69 181 7141 | 09 69 181 5141 |
| for cables RG 58 CU, 141 AU | 50 | 09 69 281 7143 | 09 69 281 5143 | 09 69 181 7143 | 09 69 181 5143 |
| for cables RG 179 BU, 187 AU | 75 | 09 69 281 7230 | 09 69 281 5230 | 09 69 181 7230 | 09 69 181 5230 |
| for cables RGD 179 | 75 | 09 69 281 7233 | 09 69 281 5233 | 09 69 181 7233 | 09 69 181 5233 |
| **Crimp / crimp contact** | | | | | |
| for cables RG 174 U, 188 AU, 316 U | 50 | 09 69 282 7140 | 09 69 282 5140 | 09 69 182 7140 | 09 69 182 5140 |
| for cables RG 179 BU, 187 AU | 75 | 09 69 282 7230 | 09 69 282 5230 | 09 69 182 7230 | 09 69 182 5230 |
| for cables RG 59 | 75 | 09 69 282 7232 | 09 69 282 5232 | 09 69 182 7232 | 09 69 182 5232 |
| for cables RGD 179 | 75 | 09 69 282 7233 | 09 69 282 5233 | 09 69 182 7233 | 09 69 182 5233 |

### Harnessing dimensions (mm)




| Part number | Ø A | Ø B | Ø C | Ø D | E | F | G |
|---|---|---|---|---|---|---|---|
| **09 69 181 x140 09 69 281 x140** | 0.85 | 1.9 | 2.3 | 3.2 | 9.5 | 5.0 | 3.0 |
| **09 69 181 x141 09 69 281 x141** | 0.85 | 1.2 | 1.4 | 2.3 | 9.5 | 5.0 | 3.0 |
| **09 69 181 x143 09 69 281 x143** | 1.00 | 3.0 | 4.4 | 5.2 | 9.5 | 5.0 | 3.0 |
| **09 69 181 x230 09 69 281 x230** | 0.50 | 1.9 | 2.3 | 3.2 | 9.5 | 5.0 | 3.0 |
| **09 69 182 x140 09 69 282 x140** | 0.60 | 1.9 | 2.4 | 3.2 | 9.0 | 5.0 | 3.0 |
| **09 69 182 x230 09 69 282 x230** | 0.60 | 1.9 | 2.4 | 3.2 | 9.0 | 5.0 | 3.0 |
| **09 69 182 x232 09 69 282 x232** | 0.95 | 3.8 | 5.1 | 6.2 | 9.0 | 4.3 | 3.7 |
| **09 69 181 x233 09 69 281 x233** | 0.50 | 1.9 | 2.6 | 3.5 | 9.5 | 5.0 | 3.0 |
| **09 69 182 x233 09 69 282 x233** | 0.60 | 1.9 | 2.6 | 3.5 | 9.3 | 4.3 | 3.0 |

[1)] S4 = 0.76 µm Au or PdNi equivalent
Dimensions see pages 05.75 and 05.76
Tooling see chapter 20



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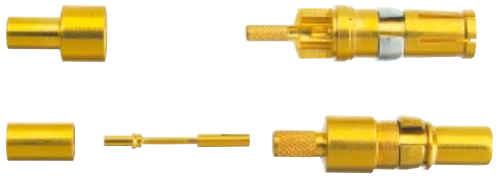
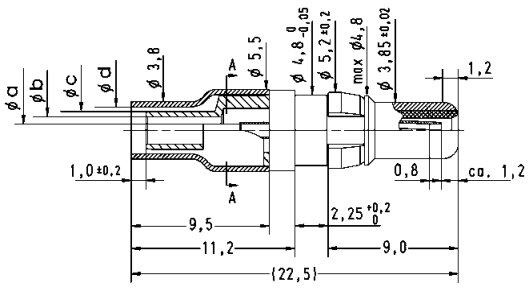


## Coaxial contacts for cable applications

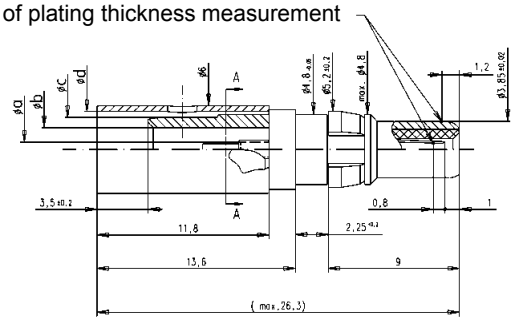
Identification | Drawing | Dimensions in mm

### Male contacts

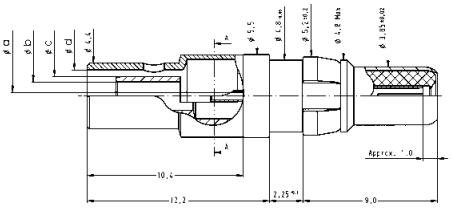
| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 281 x140 | 0.85 | 1.9 | 2.6 | 3.2 |
| 09 69 281 x141 | 0.85 | 1.2 | 1.7 | 2.3 |
| 09 69 281 x230 | 0.50 | 1.9 | 2.6 | 3.2 |



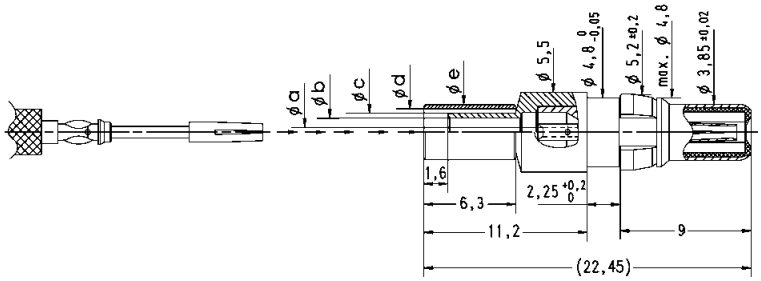

Points of plating thickness measurement



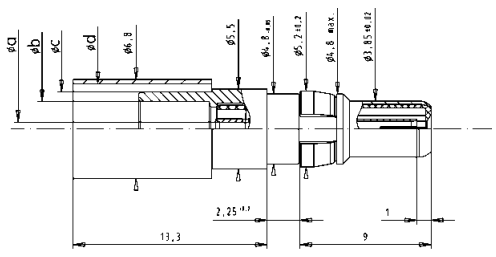
| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 281 x143 | 1.0 | 3.0 | 4.4 | 5.2 |



| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 281 x233 | 0.5 | 1.9 | 2.6 | 3.5 |




| Part number | ø a | ø b | ø c | ø d | ø e |
|---|---|---|---|---|---|
| 09 69 282 x140 | 0.6 | 1.9 | 2.6 | 3.2 | 3.8 |
| 09 69 282 x230 | 0.6 | 1.9 | 2.6 | 3.2 | 3.8 |
| 09 69 282 x233 | 0.6 | 1.9 | 2.6 | 3.5 | 4.4 |



| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 282 x232 | 0.95 | 3.8 | 5.1 | 6.2 |





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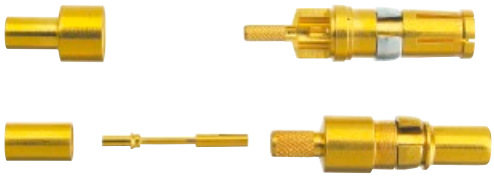
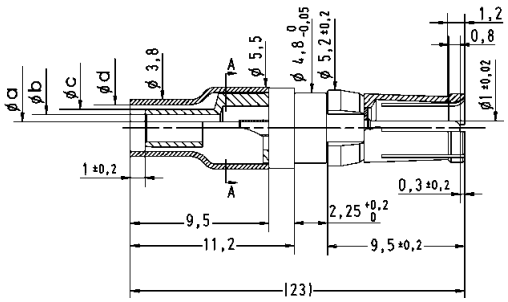


## Coaxial contacts for cable applications

Identification | Drawing | Dimensions in mm

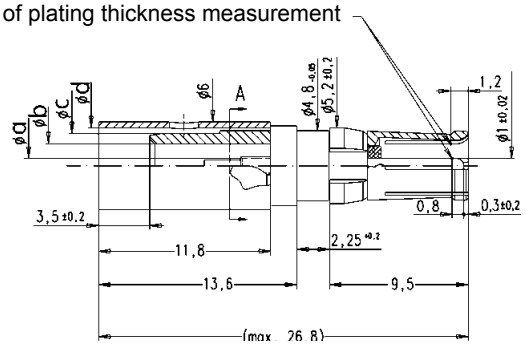
### Female contacts

| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 181 x140 | 0.85 | 1.9 | 2.6 | 3.2 |
| 09 69 181 x141 | 0.85 | 1.2 | 1.7 | 2.3 |
| 09 69 181 x230 | 0.50 | 1.9 | 2.6 | 3.2 |

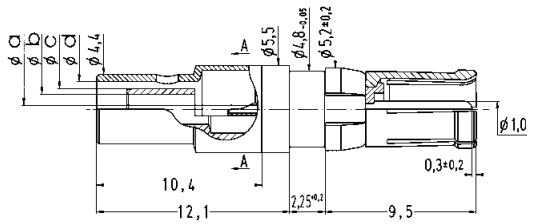



Points of plating thickness measurement

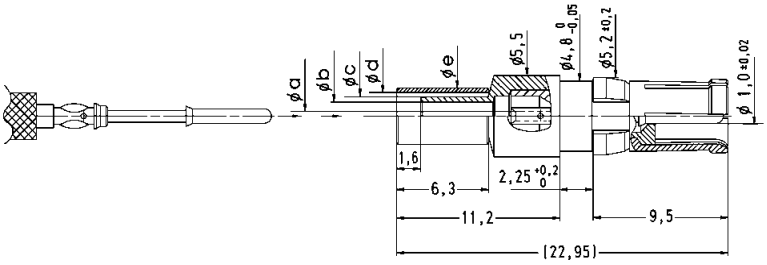
| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 181 x143 | 1.0 | 3.0 | 4.4 | 5.2 |



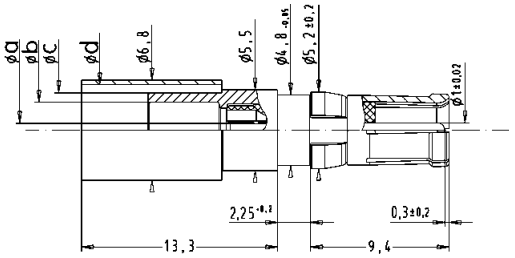

| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 181 x233 | 0.5 | 1.9 | 2.6 | 3.5 |




| Part number | ø a | ø b | ø c | ø d | ø e |
|---|---|---|---|---|---|
| 09 69 182 x140 | 0.6 | 1.9 | 2.6 | 3.2 | 3.8 |
| 09 69 182 x230 | 0.6 | 1.9 | 2.6 | 3.2 | 3.8 |
| 09 69 182 x233 | 0.6 | 1.9 | 2.6 | 3.5 | 4.4 |




| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 182 x232 | 0.95 | 3.8 | 5.1 | 6.2 |



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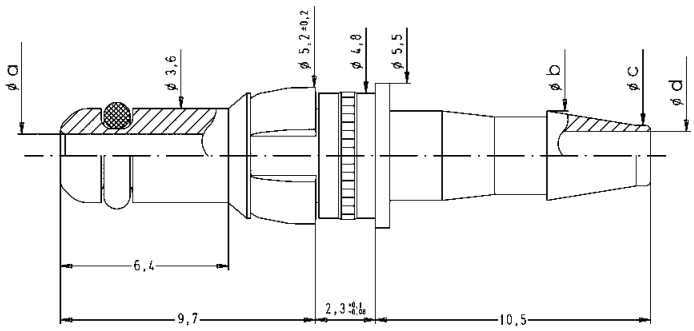
## Pneumatic contacts for cable applications

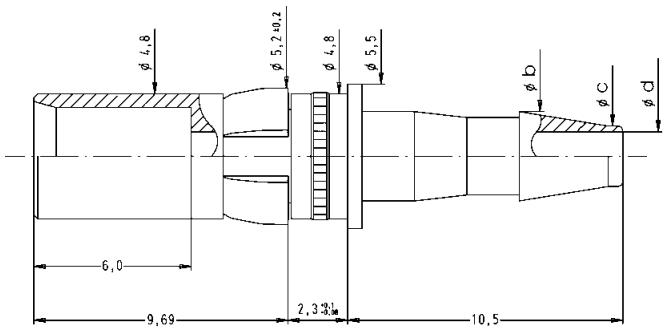
| Identification | Inner diameter air tube (mm) | Part number |
|---|---|---|
| Male contacts | | |
| | 2 | 09 69 287 0060 |
| | 2.6 | 09 69 287 0061 |
| | 3 | 09 69 287 0062 |
| | 4 | 09 69 287 0063 |
| Female contacts | | |
| | 2 | 09 69 187 0060 |
| | 2.6 | 09 69 187 0061 |
| | 3 | 09 69 187 0062 |
| | 4 | 09 69 187 0063 |

Male contacts




| Part number | ø a | ø b | ø c | ø d |
|---|---|---|---|---|
| 09 69 x87 0060 | 1.45 | 2.6 | 1.5 | 0.95 |
| 09 69 x87 0061 | 1.65 | 3.1 | 2.0 | 1.65 |
| 09 69 x87 0062 | 1.65 | 3.4 | 2.3 | 1.85 |
| 09 69 x87 0063 | 1.65 | 4.8 | 3.7 | 2.95 |

Female contacts




Dimensions in mm



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## Board drillings for connectors with straight pcb contacts

### Pcb hole patterns

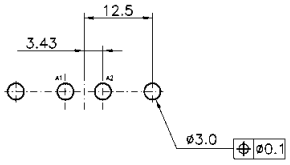
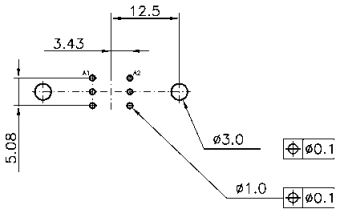
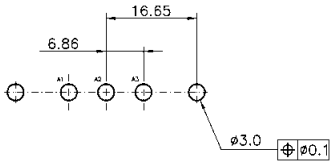
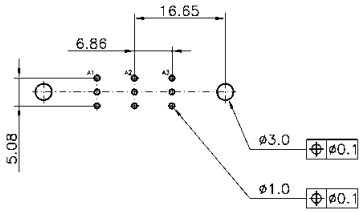
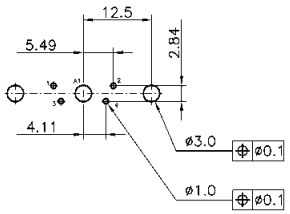
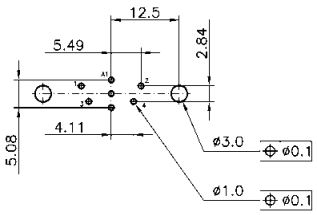
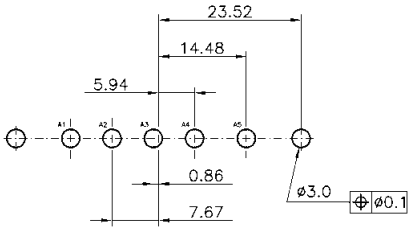
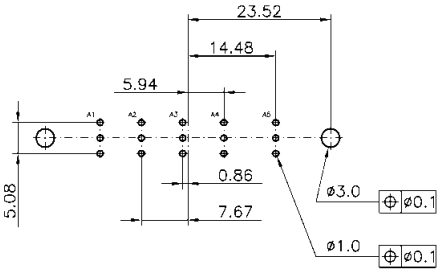
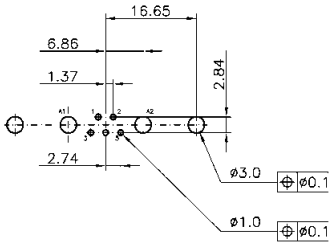
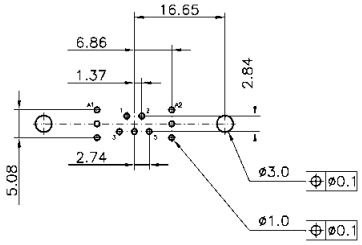
In the next pages, the pcb hole pattern is given for the power and the coaxial contact per connector layout. In the case of the power contact, the drilling hole dimension is not mentioned; the table here under provides relevant information according to the current rating of the contact and its version.

### Power contact diameter and pcb related drilling diameter

| | Straight connectors | | Right angled connectors | |
|---|---|---|---|---|
| Rating | Pin Ø (mm) | Pcb drilling Ø (mm) | Pin Ø (mm) | Pcb drilling Ø (mm) |
| 20 A | 2.60 | 2.9 | 2.85 | 3.15 |
| 30 A | – | – | 3.20 | 3.50 |
| 40 A | 3.75 | 4.0 | 3.75 | 4.05 |

Identification | Drawing | Dimensions in mm

Male connector*

| | Power contact | Coaxial contact |
|---|---|---|
| 2W2 / 2W2C |  |  |
| 3W3 / 3W3C |  |  |
| 5W1 |  |  |
| 5W5 |  |  |
| 7W2 |  |  |

* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



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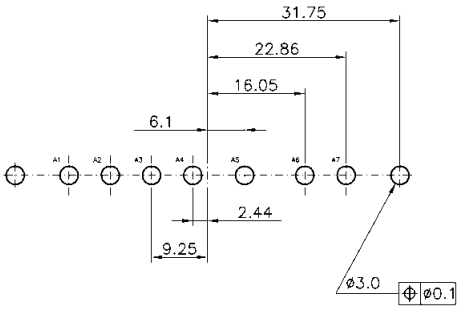
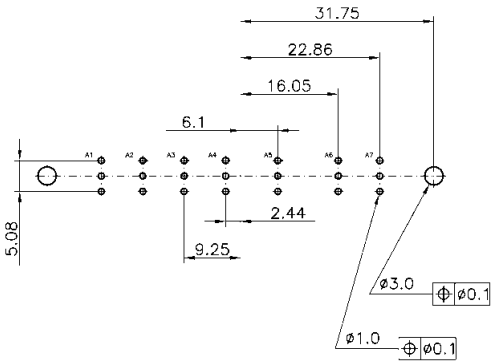
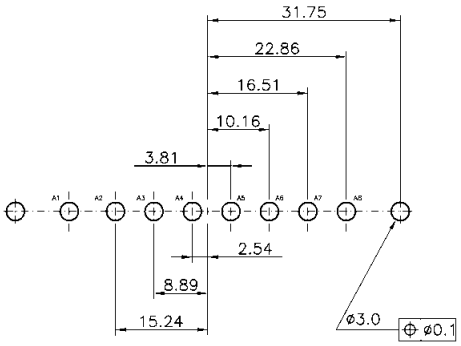
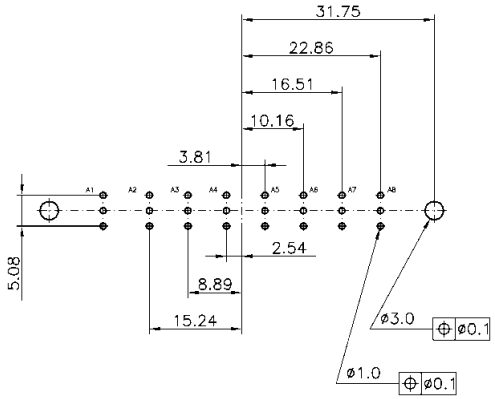
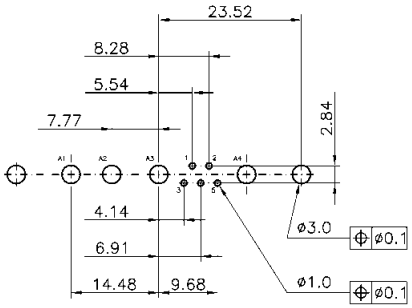
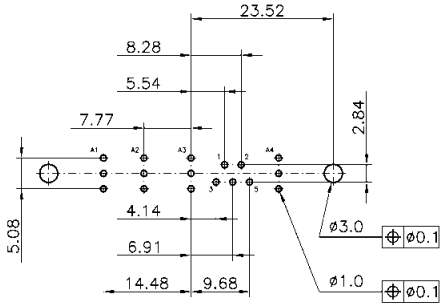
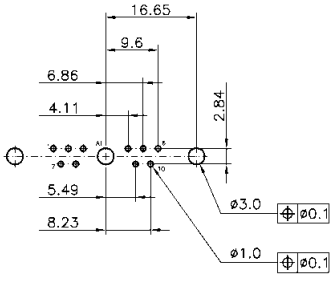
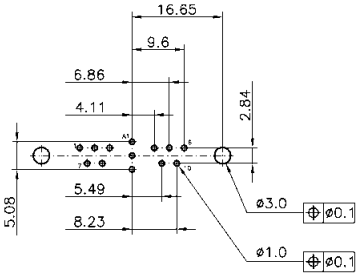
## Board drillings for connectors with straight pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|
| Male connector* | Power contact | Coaxial contact |
| 7W7 |  |  |
| 8W8 |  |  |
| 9W4 |  |  |
| 11W1 |  |  |



* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



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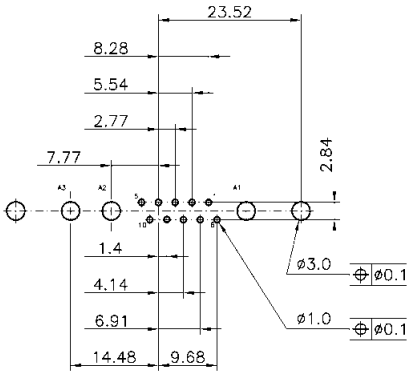
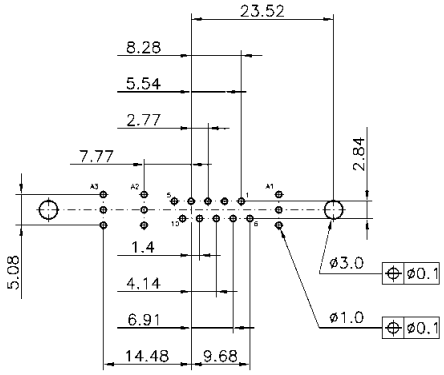
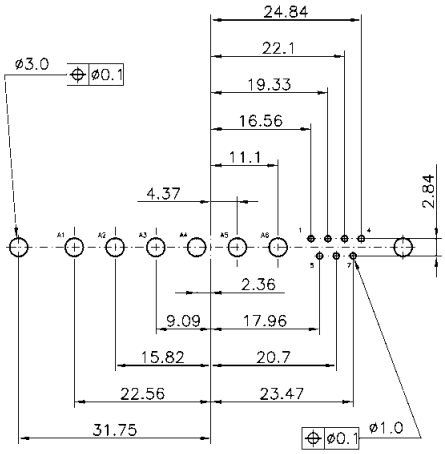
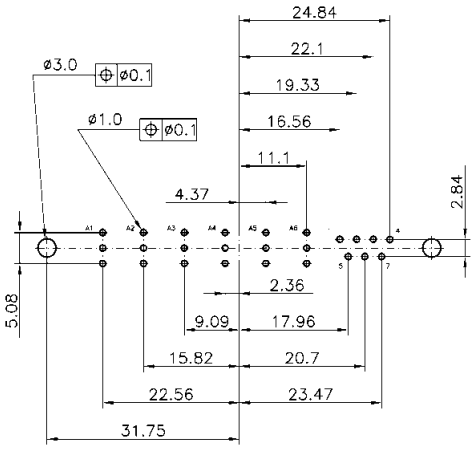
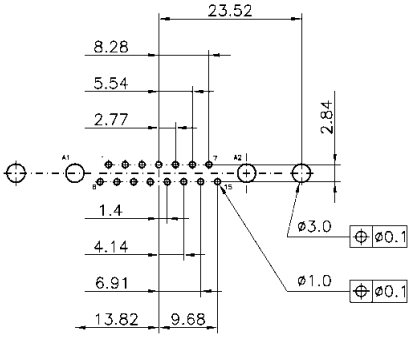
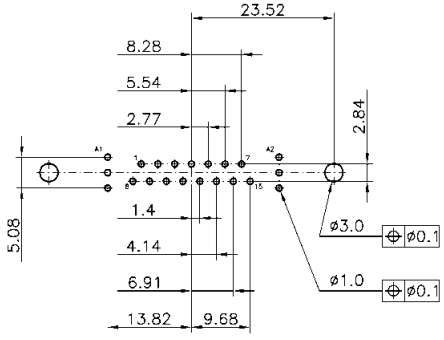
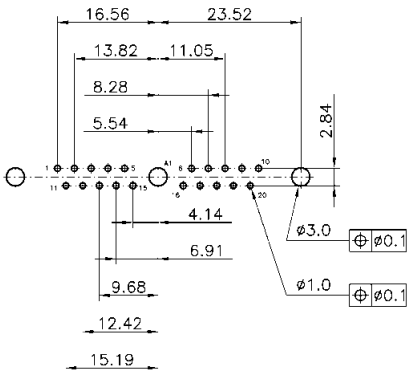
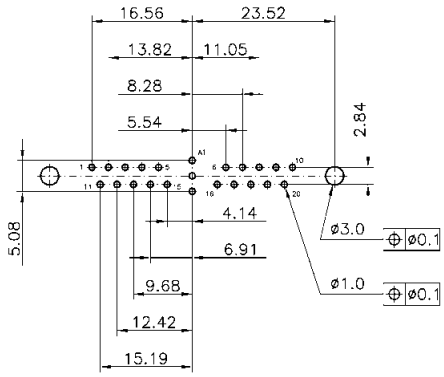
## Board drillings for connectors with straight pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|
| Male connector* | Power contact | Coaxial contact |
| 13W3 |  |  |
| 13W6 |  |  |
| 17W2 |  |  |
| 21W1 |  |  |

* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



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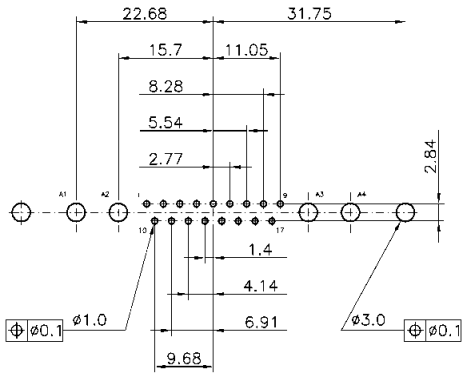
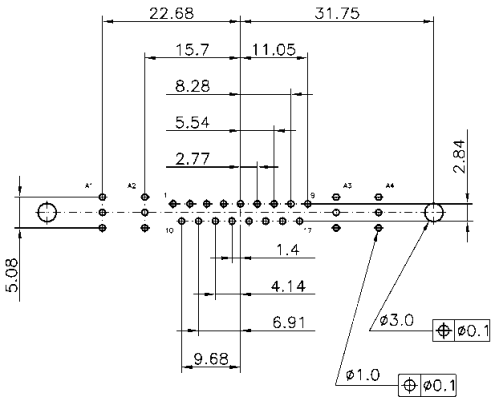
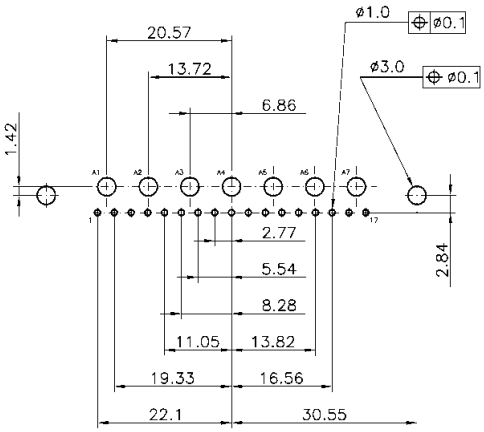
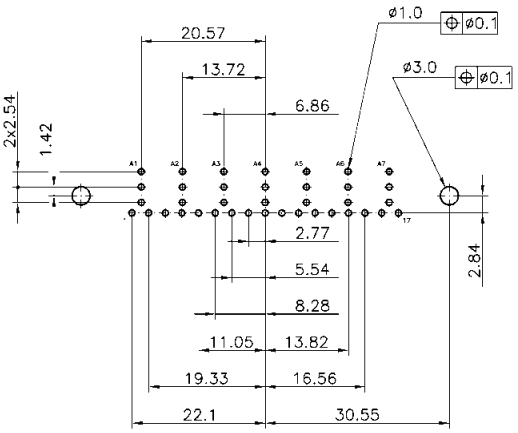
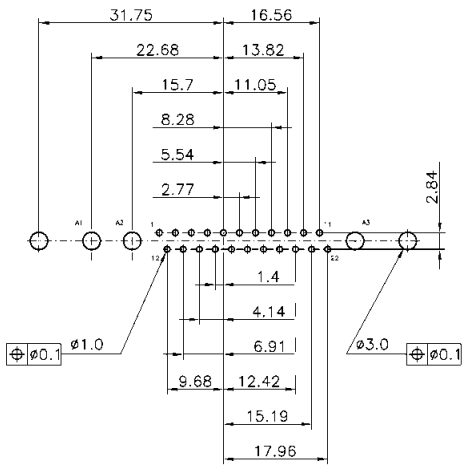
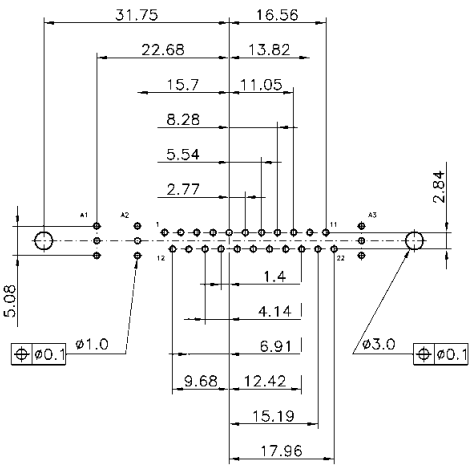
## Board drillings for connectors with straight pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|
| Male connector* | Power contact | Coaxial contact |
| 21WA4 |  |  |
| 24W7 |  |  |
| 25W3 |  |  |

* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.





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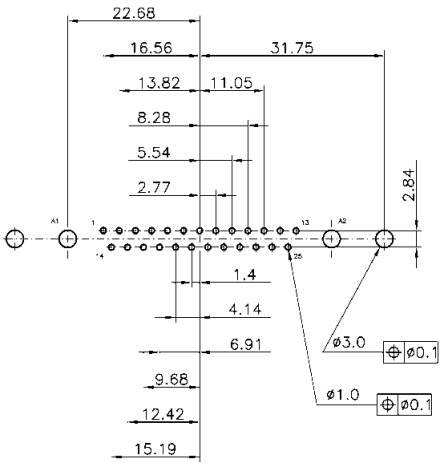
## Board drillings for connectors with straight pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|

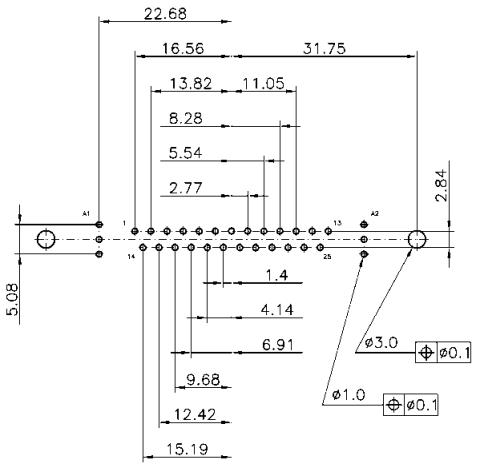
### Male connector*

#### 27W2

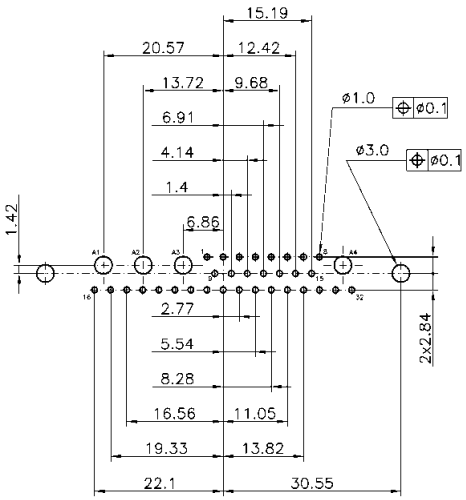
Power contact

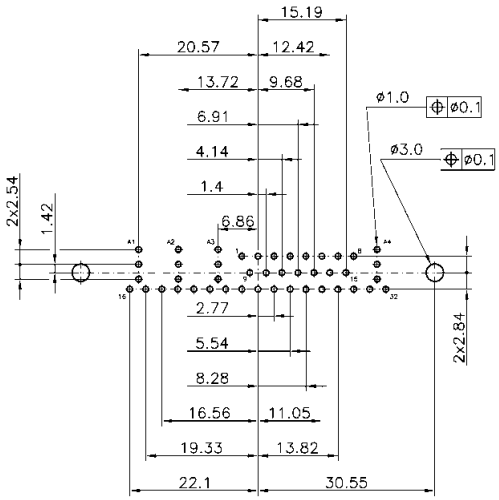



Coaxial contact

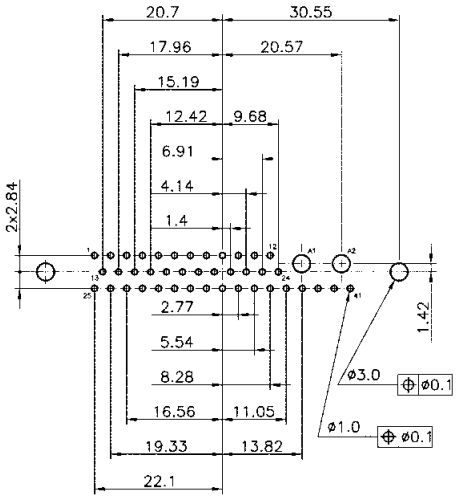


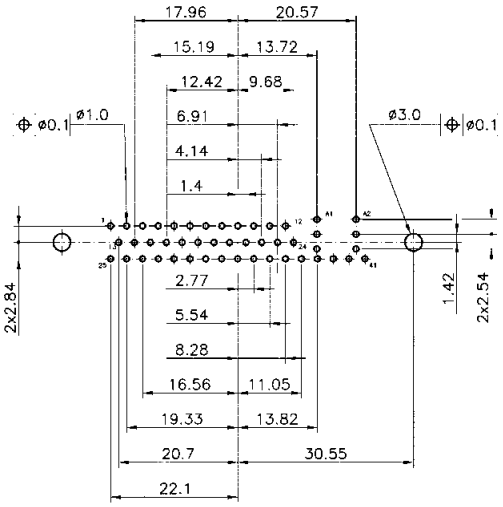

#### 36W4




#### 43W2




* When using a female connector with straight pcb contacts the board drilling pattern must be mirrored in the Y axis.



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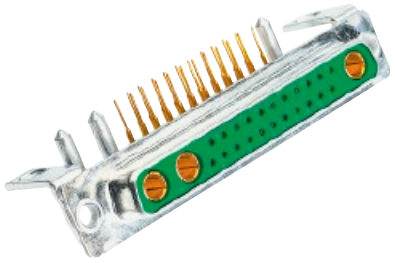
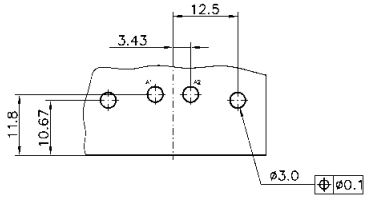
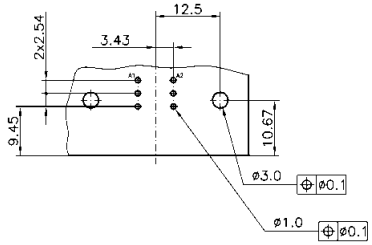
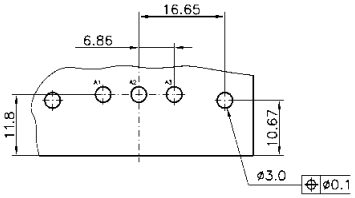
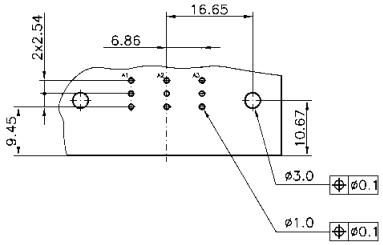
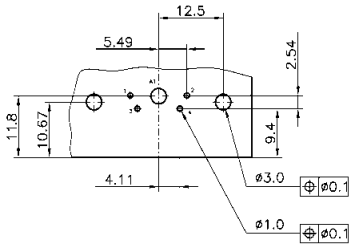
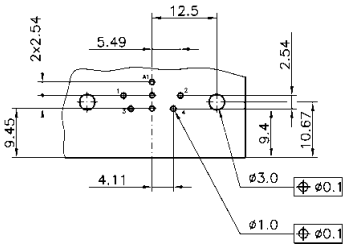
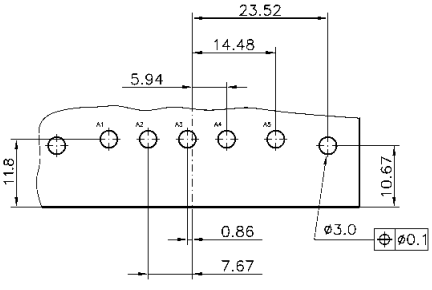
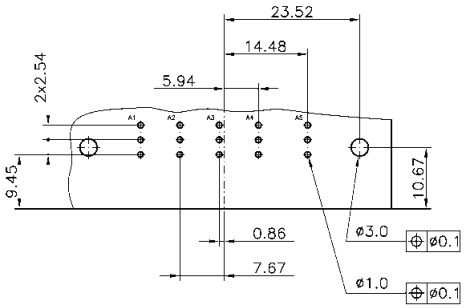
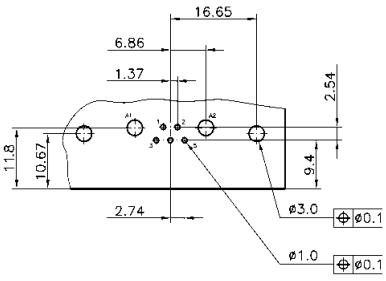
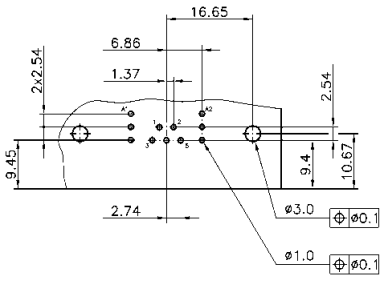


## Board drillings for connectors with right angled pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|
| Male connector* | Power contact | Coaxial contact |
| 2W2 / 2W2C |  |  |
| 3W3 / 3W3C |  |  |
| 5W1 |  |  |
| 5W5 |  |  |
| 7W2 |  |  |

* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.





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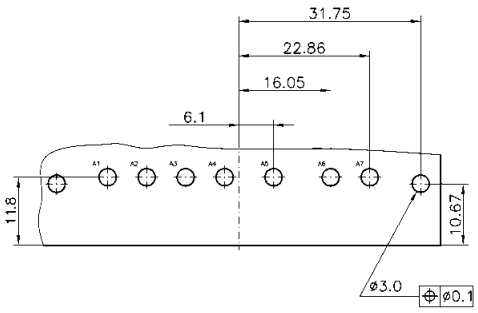
## Board drillings for connectors with right angled pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|

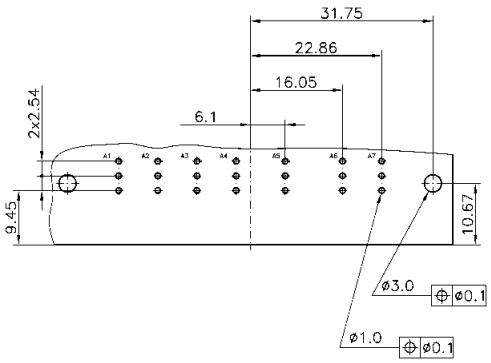
### Male connector*

#### 7W7

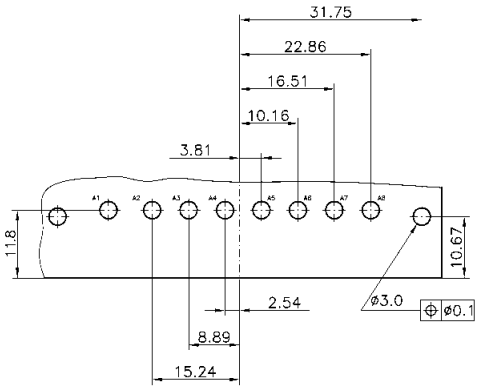
Power contact

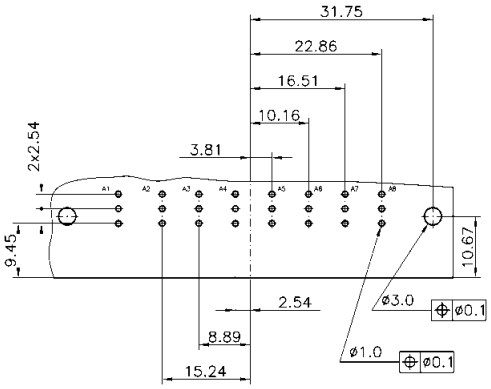



Coaxial contact

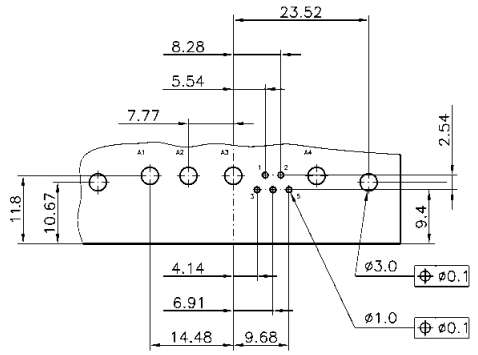


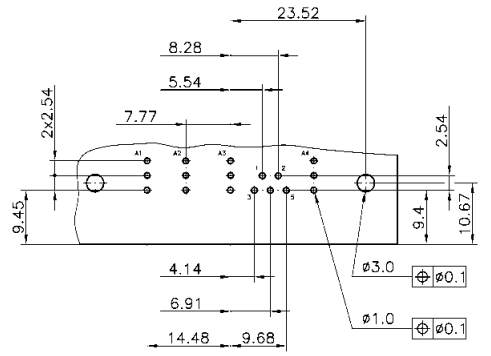

#### 8W8



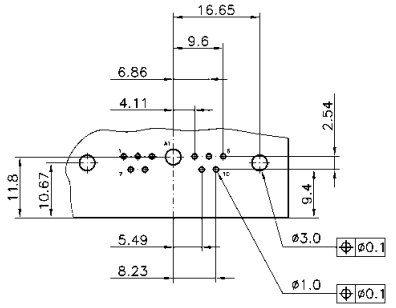



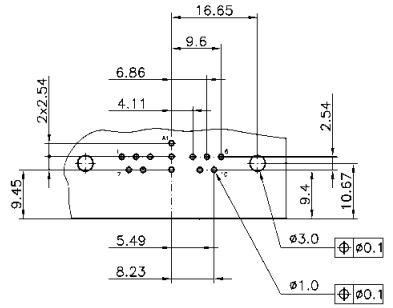

#### 9W4




#### 11W1




* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.



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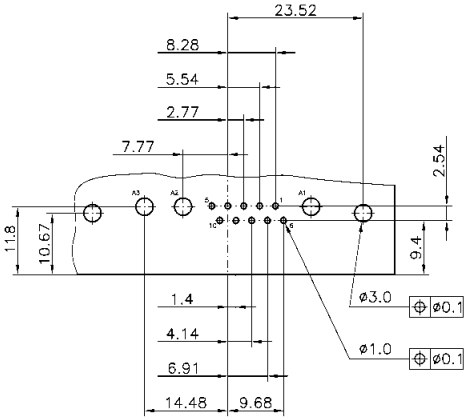
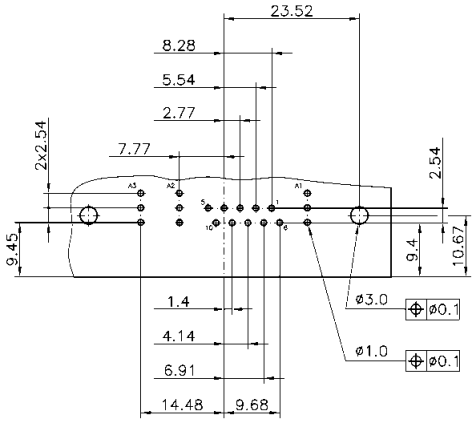
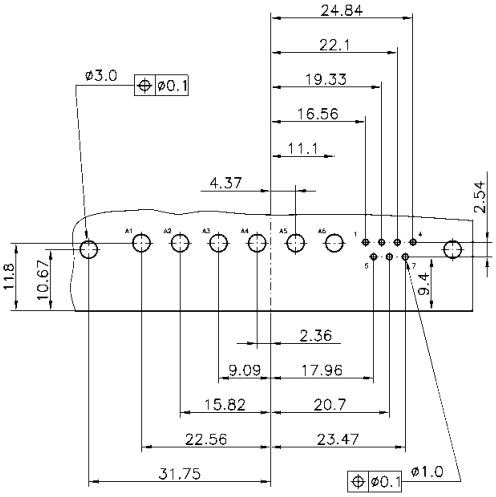
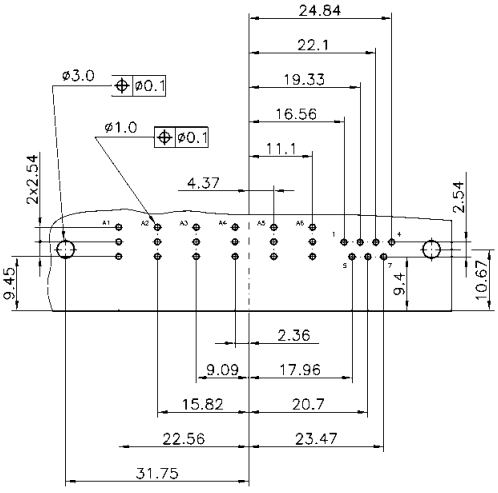
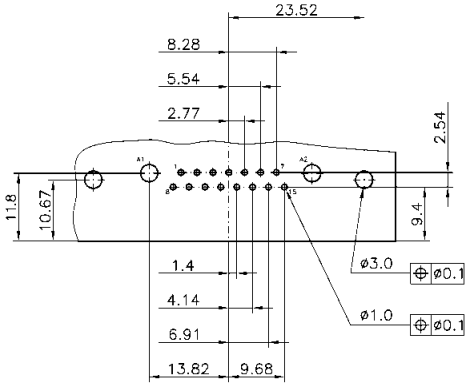
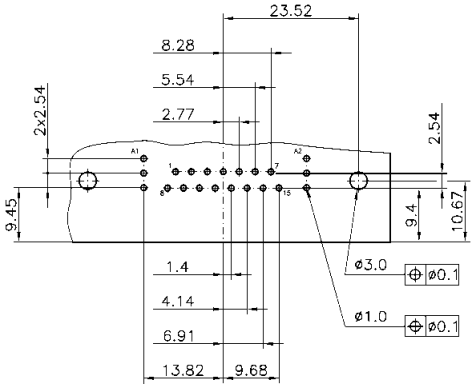
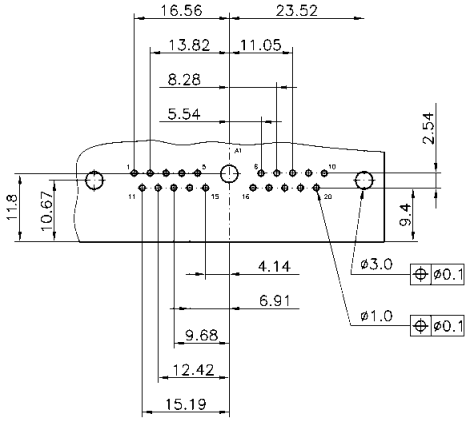
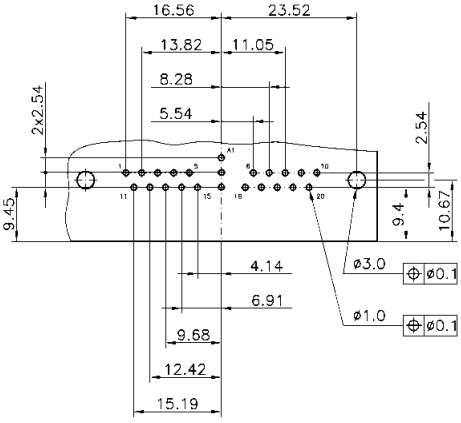
## Board drillings for connectors with right angled pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|
| Male connector* | Power contact | Coaxial contact |
| 13W3 |  |  |
| 13W6 |  |  |
| 17W2 |  |  |
| 21W1 |  |  |

* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.





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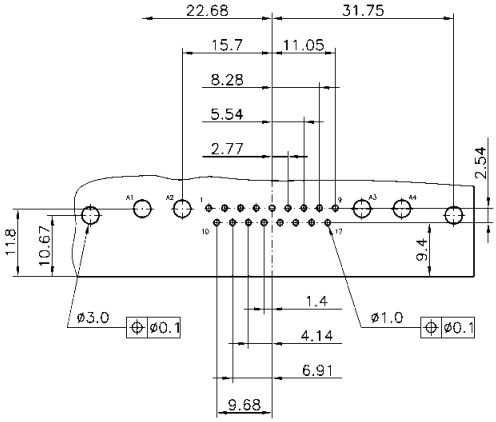
## Board drillings for connectors with right angled pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|

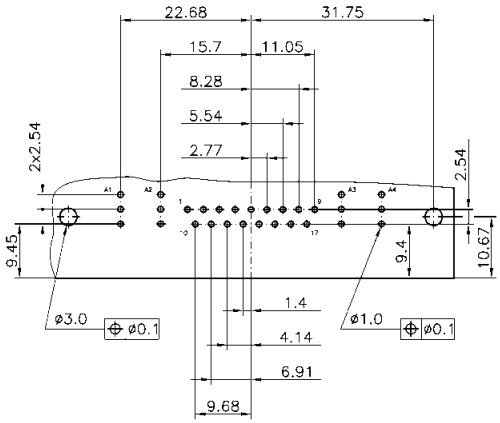
### Male connector*

#### 21WA4

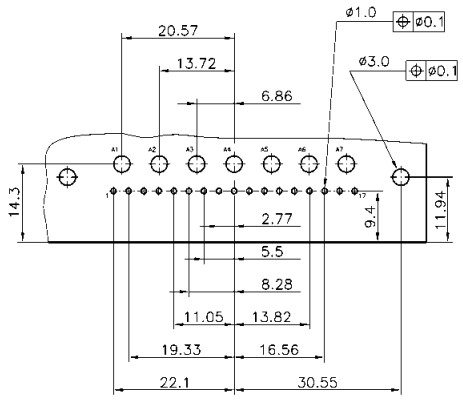
Power contact

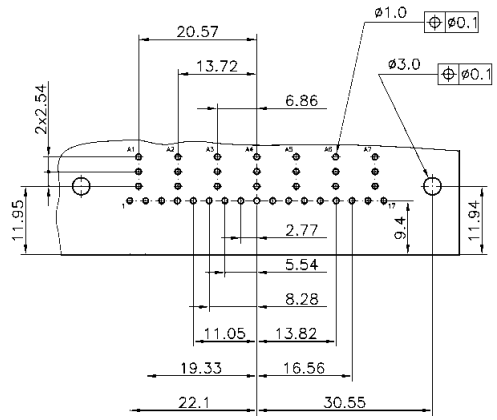



Coaxial contact

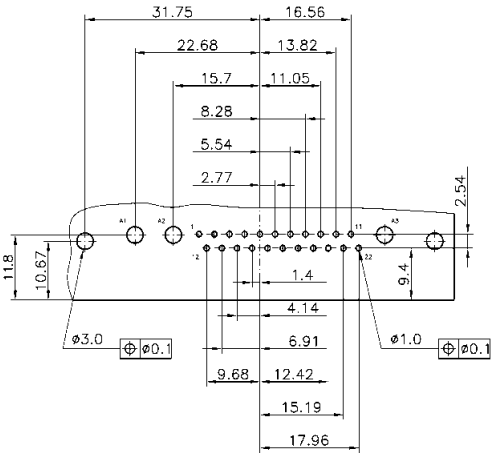


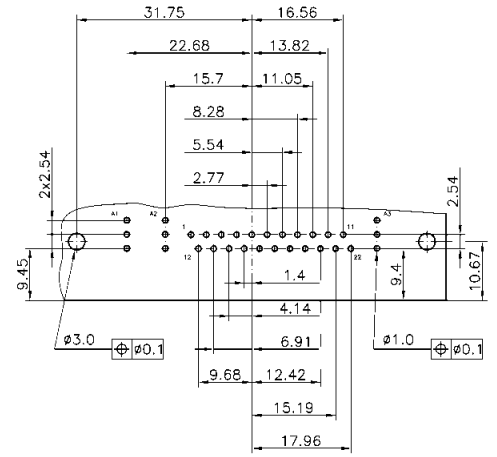

#### 24W7




#### 25W3




* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.



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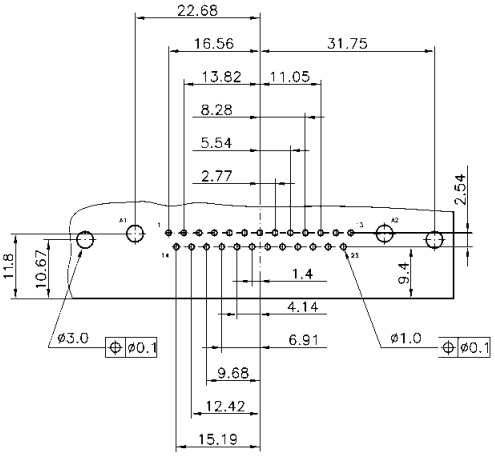
## Board drillings for connectors with right angled pcb contacts

| Identification | Drawing | Dimensions in mm |
|---|---|---|

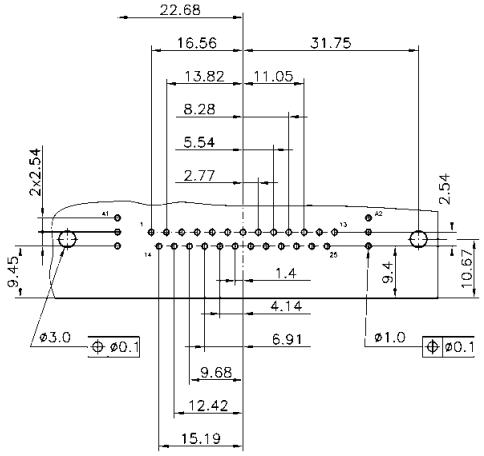
### Male connector*

#### 27W2

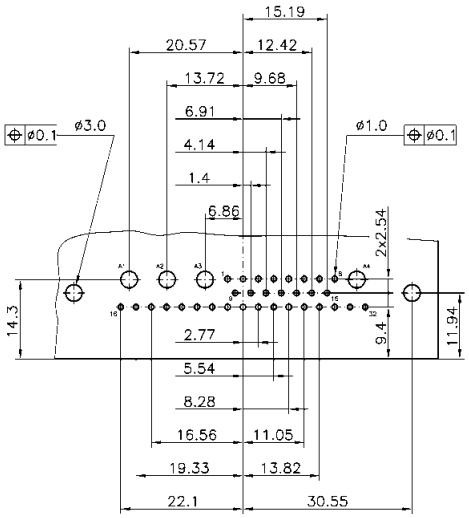
Power contact

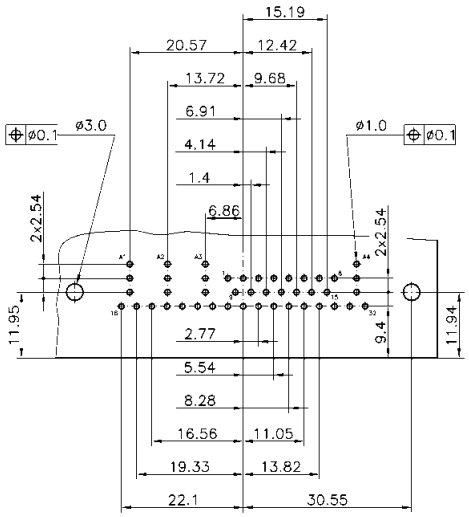



Coaxial contact

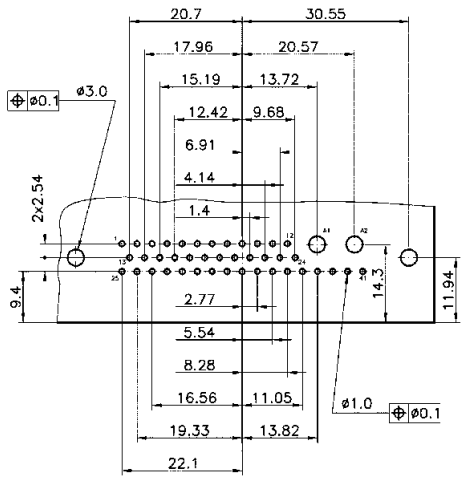


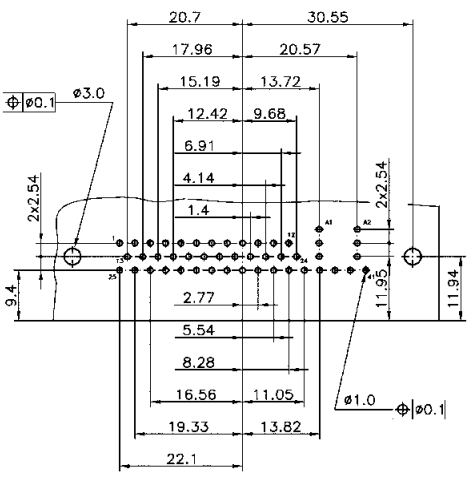

#### 36W4




#### 43W2




* When using a female connector with right angled pcb contacts the board drilling pattern must be mirrored in the Y axis.





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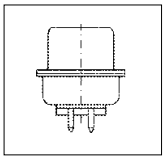
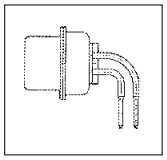
# HARTING customer request form for pcb connectors

## 1 Connector gender and type





☐ Plug (male contacts)
☐ Receptacle (female contacts)

☐ Straight ☐ Right angled

## 2 Contact arrangement

Standard

| | | | |
|---|---|---|---|
| ☐ 2W2 | ☐ 7W7 | ☐ 13W6 | ☐ 25W3 |
| ☐ 3W3 | ☐ 8W8 | ☐ 17W2 | ☐ 27W2 |
| ☐ 5W1 | ☐ 9W4 | ☐ 21W1 | ☐ 36W4 |
| ☐ 5W5 | ☐ 11W1 | ☐ 21WA4 | ☐ 43W2 |
| ☐ 7W2 | ☐ 13W3 | ☐ 24W7 | |

Special configurations (mixed contact genders)

☐ 2W2C ☐ 3W3C

### 2.1 Any signal contacts?

☐ Yes (fill in questions below) ☐ No (go directly to item 2.2)

☐ Right angled 2.54 mm pitch
☐ Other pitch: _____

### 2.2 Any power contacts?

☐ Yes (fill in questions below) ☐ No (go directly to item 2.3)

Current rating

☐ 10 A ☐ 30 A
☐ 20 A ☐ 40 A

Termination type

☐ Solder pin for pcb
☐ Press-in for pcb (30 A, straight version only)

Performance level
[mating side / termination side]

☐ S4 [0.76 µm Au / 0.2 µm Au]
☐ PL 3 [0.2 µm Au / 5.0 µm Sn]

### 2.3 Any coaxial contacts?

☐ Yes (fill in questions below) ☐ No (go directly to item 2.4)

Impedance

☐ 50 Ω
☐ 75 Ω

Performance level
[mating side inner / outer conductor]

☐ S4 [1.3 µm Au / 0.76 µm Au]
☐ PL 3 [0.2 µm Au / 0.2 µm Au]

### 2.4 Any high voltage contacts?

☐ Yes ☐ No (go directly to item 2.5)

### 2.5 Any pneumatic contacts?

☐ Yes (fill in questions below) ☐ No (go directly to item 3)

Tube inner diameter / suitable compressed air tube

☐ 2 mm / PU-2 ☐ 2.6 mm / PU-N4* 2.5
☐ 3 mm / PU-3 ☐ 4 mm / PU-4



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# HARTING customer request form for pcb connectors

## 3 Pcb mounting accessories (select appropriate fixing accessories)

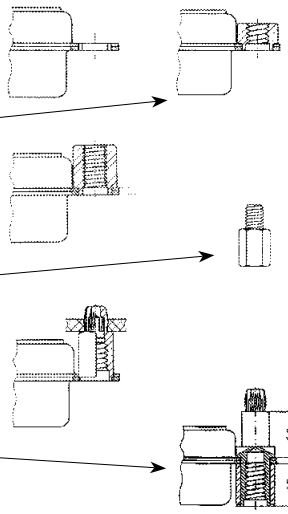
### 3.1 Right angled version

- ☐ Through hole
- ☐ Nut 4-40 UNC
- ☐ Nut M3
- ☐ Metal bracket
- ☐ Snap clip

Screw lock

- ☐ fixed ☐ removable
- ☐ 4-40 UNC ☐ M3

### 3.2 Straight version



- ☐ Through hole
- ☐ Nut 4-40 UNC
- ☐ Nut M3
- ☐ Spacer 4-40 UNC
- ☐ Spacer M3
- ☐ Screw lock 4-40 UNC
- ☐ Spacer 4-40 UNC + clip
- ☐ Spacer M3 + clip

Spacer + clip and screw lock

- ☐ M3 ☐ 4-40 UNC

## 4 Additional information

Pcb thickness: ***(if possible provide pcb layout with plating specifications)***

Operating temperature: ☐ standard ☐ SMC compatible

Is hot plugging required ☐ No ☐ Yes Short description: _____

Is blind mating feature required? ☐ No ☐ Yes (provide precise requirements)

Name: _____ Drawing: ☐ no ☐ yes

Company: _____ Samples: ☐ no ☐ yes, quantity

Address: _____ Volume (pcs./year): _____

Phone: _____ Special requirements: _____

Fax: _____

E-Mail: _____



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## Interference – Yesterdays problem!

In a fast developing technological environment the management of electromagnetic interference is becoming more challenging.

Therefore HARTING developed a range of filter solutions to help designers of electronic equipments to achieve the demanding goal of electromagnetic compatibility.

HARTING offers a wide range of solutions by the integration of a filter inside one of the most standard I/O ports on the market; the D-Sub.

From standard simple ferrite-filter solution to complex customized high performance filters, you will be able to find in the HARTING filter D-Sub range the adequate solution to protect your application from any introduction or radiation of noise through D-Sub port apertures.

## Advantages

Wide range:

- 9, 15, 25 and 37 contact versions
- Various terminations such as solder buckets, straight and right angled solder pins
- A large range of accessories
- High performance (C-filter) as well as simple, quick and cost effective solutions (ferrite-filter)

Compatible with standard wave and lead-free reflow soldering (C-filter)

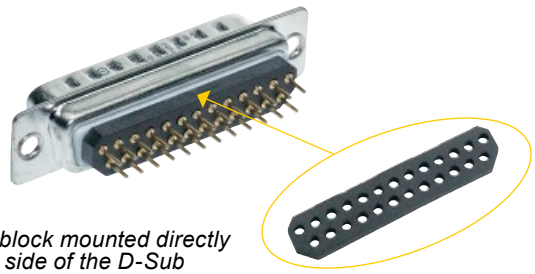
Same layout and shell dimensions as standard D-Sub connectors, no modification of PCB design necessary

Elimination of ringing, crosstalk phenomenon thanks to specific multilayer PCB used in C-filter design.

Flexible filter structure allowing a wide range of customization:

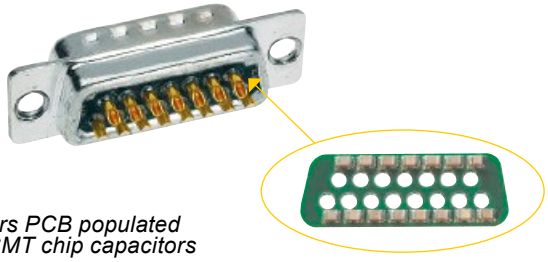
- Filter value (even pin by pin approach)
- Pi-filter
- Dielectric withstanding and working voltage
- Specific ESD / lightening protection

## HARTINGs broad Filter range



*Ferrite block mounted directly on rear side of the D-Sub*

**Ferrite-filter**
Ferrite-filter D-Subs providing a low level of filtering thanks to simple blocks of inductive ferrite attached to the back end of the connectors.
Providing a few dB attenuation only at high frequencies HARTING ferrite-filter D-Subs represent a cost effective solution in applications where the emission level is close to the limit.



*4 layers PCB populated with SMT chip capacitors*

**C-filter**
To address higher EMI disturbances HARTING propose a comprehensive range of C-filter D-Sub connectors. HARTING C-filter D-Sub integrates a patented 4 layer printed circuit board equipped with chip capacitors. This patented solution provides complete protection of the I/O port due to the filtering performance of the capacitors and the screening effect of the PCB. Further more the 4 layers PCB also limits the ability of interference to enter the equipment through the D-Sub aperture. Available in 4 standard filter values 47, 470, 1000 and 3900 pF HARTING C-filter D-Subs represent for all designers a smart filtering solution allowing replacement of a “defective” port by a filtered one without any change of the PCB design.

**Filter adapter**
To support engineers in the diagnosis of EMI disturbances HARTING has developed, in addition to its filter series a range of male/female filter D-Sub adapters.
These back-to-back adapters can be used as testing tools and replaced later on in production directly by a filtered D-Sub connector.



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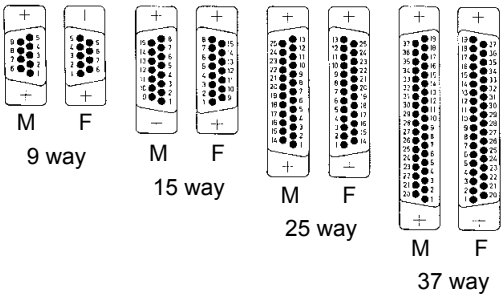
| | |
|---|---|
| Number of contacts | 9, 15, 25, 37 |
| Working current | 7.5 A max. |
| Working voltage | 250 V AC max. |
| Dielectric withstanding voltage | 500 V AC for 1 minute |
| Contact resistance | ≤ 15 mΩ |
| Insulation resistance | ≥ 1000 MΩ |
| Temperature range | -55 °C … +105 °C |
| Terminations | a) Solder buckets AWG 20<br>b) Solder pins for P.C.B. holes Ø 1 ± 0.05 mm<br>c) Solder pins, angled 90° for P.C.B. holes Ø 1 ± 0.05 mm |
| **Materials** | |
| Insulation | PBT, flame retardant acc. to UL 94-V0 |
| Contacts | Copper alloy |
| **Contact surface** | |
| Performance level | Performance level 3, as per IEC 60807-2, IEC 60512-25-2 |
| Metal shell | Steel (tin-plated) |

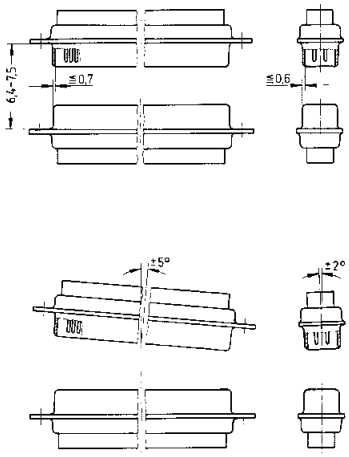
## Contact arrangement

View from termination side




M = Male connector
F = Female connector

## Mating conditions as per CECC 75301




## Minimum insertion loss

| Frequency [MHz] | Attenuation [dB] |
|---|---|
| 1 | 0.5 |
| 10 | 1.0 |
| 50 | 2.5 |
| 100 | 3.0 |
| 500 | 3.5 |
| 1000 | 4.0 |





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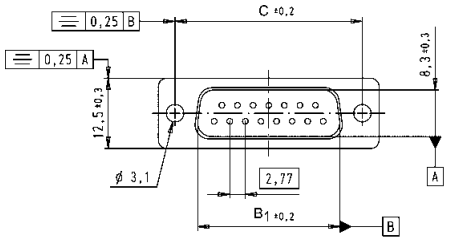
Number of contacts

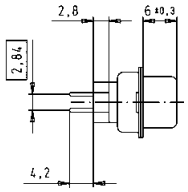
# 9–25

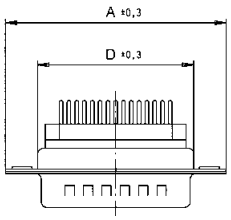
## Solder pins, straight, through hole

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with ferrite-filter | 9 | 09 64 122 7800 | 09 64 112 7800 |
| | 15 | 09 64 222 7800 | 09 64 212 7800 |
| | 25 | 09 64 322 7800 | 09 64 312 7800 |

Male connector

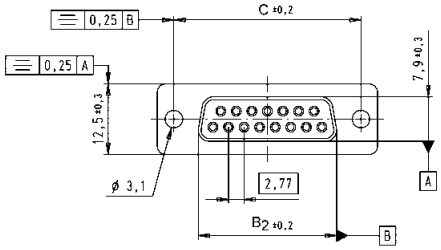


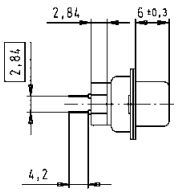



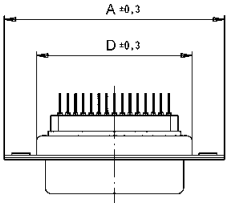




| No. of contacts | A | $B_1$ | $B_2$ | C | D |
|---|---|---|---|---|---|
| 9 | 30.8 | 16.92 | 16.3 | 25.0 | 19.2 |
| 15 | 39.2 | 25.25 | 24.6 | 33.3 | 27.7 |
| 25 | 53.1 | 38.96 | 38.3 | 47.1 | 41.1 |

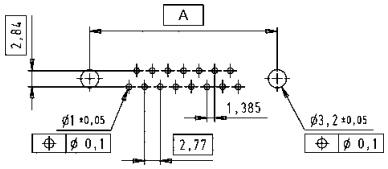
Female connector




Board drillings




Dimensions in mm



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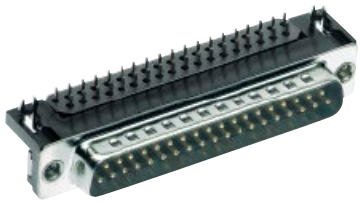
Number of contacts

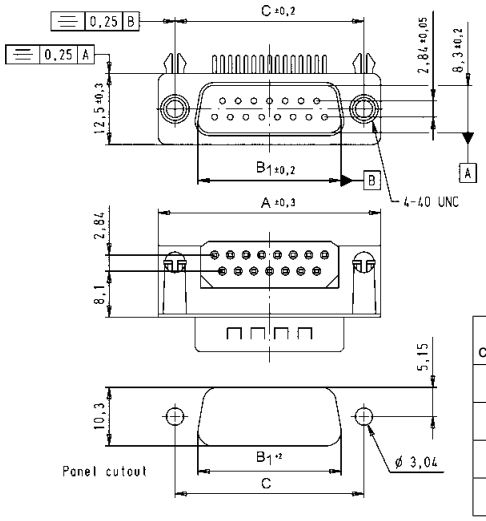
# 9–37



## Solder pins, right angled, board lock and clinch nut

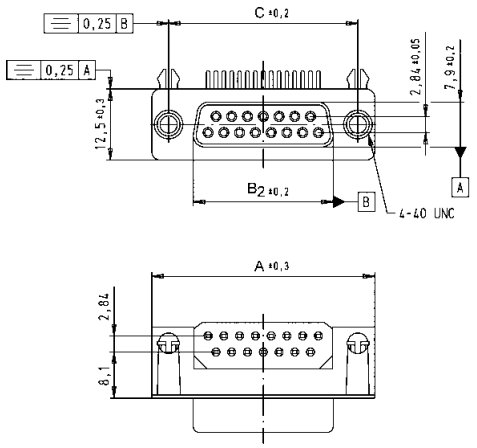
| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with ferrite-filter | 9 | 09 64 123 7802 | 09 64 113 7802 |
| | 15 | 09 64 223 7802 | 09 64 213 7802 |
| | 25 | 09 64 323 7802 | 09 64 313 7802 |
| | 37 | 09 64 423 7802 | 09 64 413 7802 |

Male connector

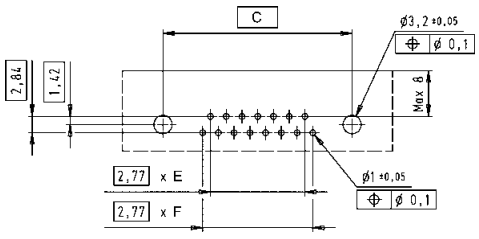



| No. of contacts | A | $B_1$ | $B_2$ | C | E | F |
|---|---|---|---|---|---|---|
| 9 | 30.8 | 16.92 | 16.3 | 25.0 | 3 | 4 |
| 15 | 39.2 | 25.25 | 24.6 | 33.3 | 6 | 7 |
| 25 | 53.1 | 38.96 | 38.3 | 47.1 | 11 | 12 |
| 37 | 69.4 | 55.42 | 54.8 | 63.5 | 17 | 18 |

Female connector




Board drillings




Dimensions in mm



Downloaded from Arrow.com.

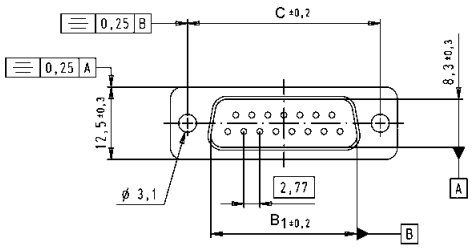
Number of contacts

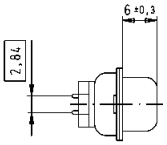
# 9–37

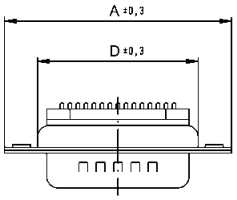
## Solder buckets, through hole

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with ferrite-filter | 9 | 09 64 121 7800 | 09 64 111 7800 |
| | 15 | 09 64 221 7800 | 09 64 211 7800 |
| | 25 | 09 64 321 7800 | 09 64 311 7800 |
| | 37 | 09 64 421 7800 | 09 64 411 7800 |

Male connector

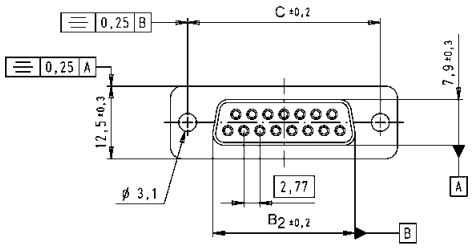


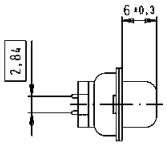



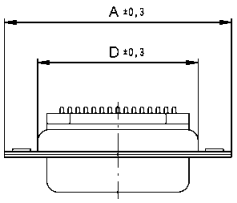




| No. of contacts | A | $B_1$ | $B_2$ | C | D |
|---|---|---|---|---|---|
| 9 | 30.8 | 16.92 | 16.3 | 25.0 | 19.2 |
| 15 | 39.2 | 25.25 | 24.6 | 33.3 | 27.7 |
| 25 | 53.1 | 38.96 | 38.3 | 47.1 | 41.1 |
| 37 | 69.4 | 55.42 | 54.8 | 63.5 | 57.3 |

Female connector




Dimensions in mm



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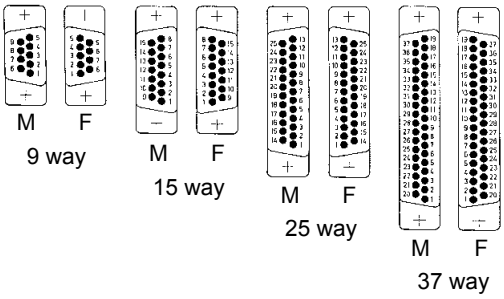
| | |
|---|---|
| Number of contacts | 9, 15, 25, 37 |
| Working current | 7.5 A max. (connectors)<br>6.5 A max. (filter adapters) |
| Working voltage | 100 V max. for standard capacitance values – higher working voltages are available as specific. |
| Dielectric withstanding voltage | 250 V DC max. – higher dielectric withstanding voltages are available as specific (see page 05.112) |
| Contact resistance | ≤ 10 mΩ |
| Insulation resistance | ≥ 1000 MΩ |
| Temperature range | -55 °C … +125 °C (connectors)<br>Heat deflection temperature limit according to DIN 53461: … +255 °C<br><br>-20 °C … +125 °C (filter adapters) |
| Terminations | a) Solder buckets max. 0.8 mm²<br>b) Solder pins Ø 0.6 mm for P.C.B. holes Ø 0.8/1 mm<br>c) Solder pins, angled 90° Ø 0.6 mm for P.C.B. holes Ø 0.8/1 mm |
| **Materials** | |
| Insulation | PCT, glass-fibre filled, flame retardant acc. to UL 94-V0<br>Colour: natural |
| Contacts | Copper alloy<br>Male and female contacts are turned |
| **Contact surface** | |
| Contact zone | Selectively plated according to performance level |
| Performance level | Performance level 2, as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60512 |
| Metal shell | Steel |

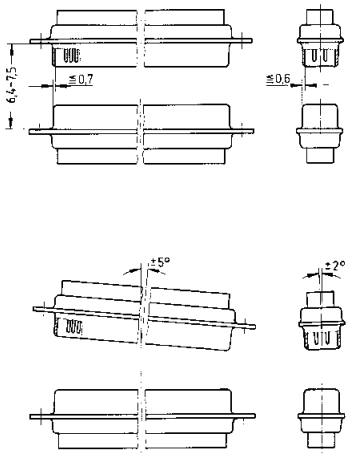
## Contact arrangement

View from termination side




M = Male connector
F = Female connector

## Mating conditions as per CECC 75301




Pi filters are only available for male connectors





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## Attenuation characteristics for standard capacitance values

### Min. insertion loss

| Capacitance [pF][1) ] / Frequency [MHz] | Attenuation (in dB) vs. frequency [MHz] | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 5 | 10 | 50 | 100 | 500 | 1000 |
| 47 | | | | | | 30 | 35 |
| 470 | | | 1 | 11 | 16 | 35 | 32 |
| 1000 | | 1 | 3 | 12 | 24 | 38 | 30 |
| 3900 | 1 | 6 | 11 | 25 | 35 | 38 | 32 |

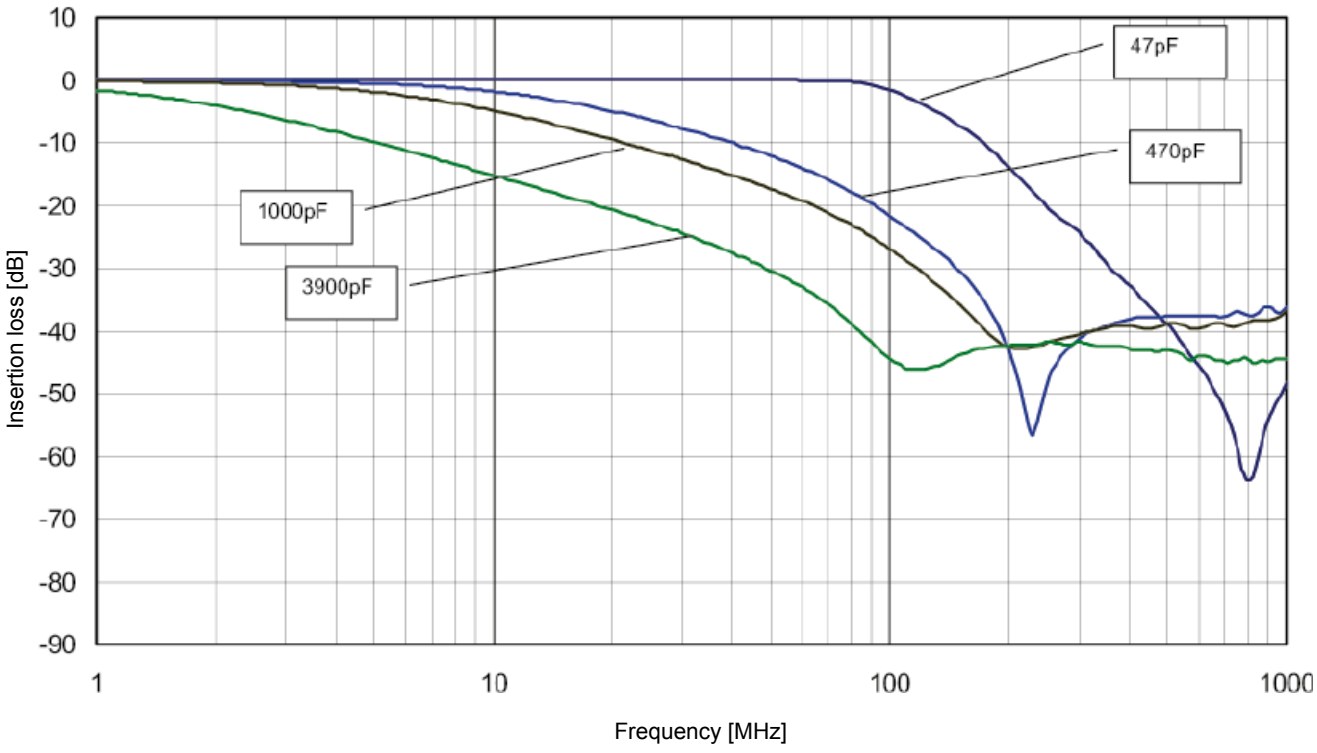
[1)] Capacitance tolerance = ± 20 % (For other capacitor values see pages 05.112 ff).

Measured in 50 Ω system according to MIL-STD-220, no load.

Working voltage: 100 V max. for standard capacitance values – higher working voltages are available as specific.

Dielectric withstanding voltage: 250 V DC max. – higher dielectric withstanding voltages are available as specific (see page 05.112)

### Typical insertion loss for different filters (measured)



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Number of contacts

# 9–37

## Filter adapters

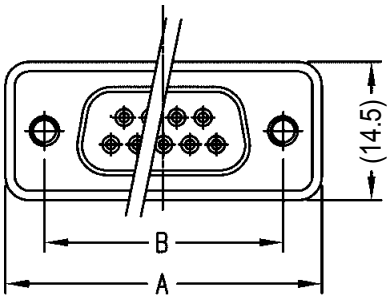
| Identification | No. of contacts | Part number |
|---|---|---|
| Male / female filter adapters with C filter | | |
| | 9 | 09 64 100 72 . . |
| | 15 | 09 64 200 72 . . |
| | 25 | 09 64 300 72 . . |
| | 37 | 09 64 400 72 . . |

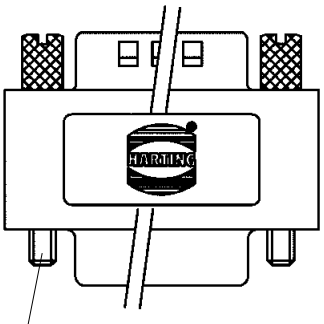
Please insert digit for capacitance

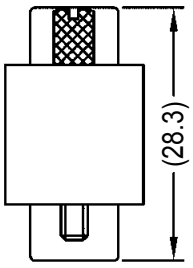
- 47 pF ▶ 10
- 470 pF ▶ 20
- 1000 pF ▶ 30
- 3900 pF ▶ 40

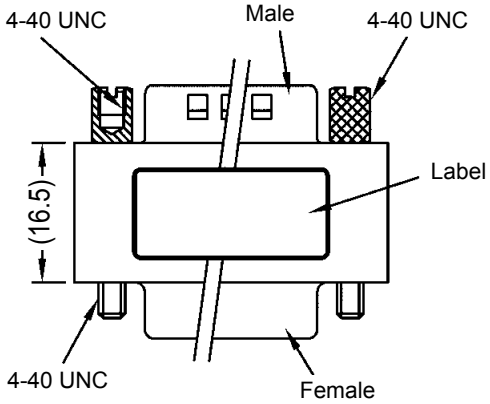
## Dimensions

| | A | B |
|---|---|---|
| 9 | 32.8 | 24.99 |
| 15 | 41.1 | 33.32 |
| 25 | 55.0 | 47.04 |
| 37 | 71.3 | 63.50 |




Screws are not pre-mounted to allow mounting from any ends

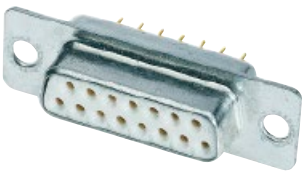
Dimensions in mm



Downloaded from Arrow.com.

Number of contacts

# 9–37



## Turned solder pins, straight, through hole

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with **47 pF** C filter | 9 | 09 64 122 7210 | 09 64 112 7210 |
| | 15 | 09 64 222 7210 | 09 64 212 7210 |
| | 25 | 09 64 322 7210 | 09 64 312 7210 |
| | 37 | 09 64 422 7210 | 09 64 412 7210 |
| Connectors with **470 pF** C filter | 9 | 09 64 122 7220 | 09 64 112 7220 |
| | 15 | 09 64 222 7220 | 09 64 212 7220 |
| | 25 | 09 64 322 7220 | 09 64 312 7220 |
| | 37 | 09 64 422 7220 | 09 64 412 7220 |
| Connectors with **1000 pF** C filter | 9 | 09 64 122 7230 | 09 64 112 7230 |
| | 15 | 09 64 222 7230 | 09 64 212 7230 |
| | 25 | 09 64 322 7230 | 09 64 312 7230 |
| | 37 | 09 64 422 7230 | 09 64 412 7230 |
| Connectors with **3900 pF** C filter | 9 | 09 64 122 7240 | 09 64 112 7240 |
| | 15 | 09 64 222 7240 | 09 64 212 7240 |
| | 25 | 09 64 322 7240 | 09 64 312 7240 |
| | 37 | 09 64 422 7240 | 09 64 412 7240 |



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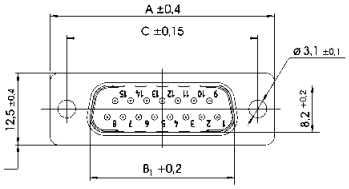
Number of contacts

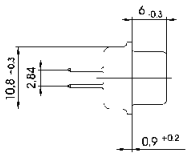
# 9–37

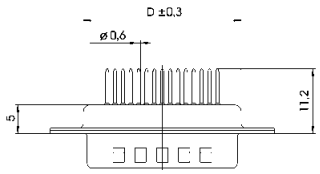
## Turned solder pins, straight, through hole

| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Male connector

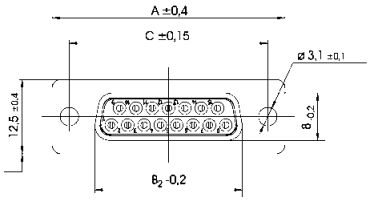


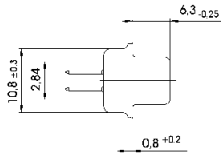



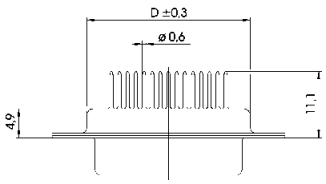




| No. of contacts | A | $B_1$ | $B_2$ | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|
| 9 | 30.8 | 16.9 | 16.4 | 25.00 | 19.3 | 1.37 | 2.74 | 12.50 |
| 15 | 39.1 | 25.2 | 24.7 | 33.30 | 27.5 | 1.37 | 2.74 | 16.65 |
| 25 | 53.0 | 38.9 | 38.5 | 47.04 | 41.3 | 1.40 | 2.77 | 23.52 |
| 37 | 69.3 | 55.3 | 54.9 | 63.50 | 57.7 | 1.40 | 2.77 | 31.75 |

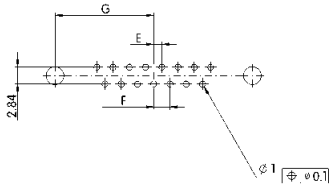
### Female connector




### Board drillings

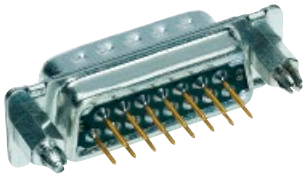


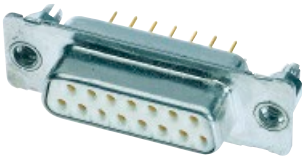



Downloaded from Arrow.com.

Number of contacts

# 9–37





## Turned solder pins, straight, straight board clips

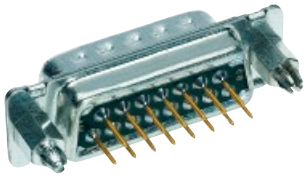
| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with **47 pF** C filter | 9 | 09 64 122 721 . | 09 64 112 721 . |
| | 15 | 09 64 222 721 . | 09 64 212 721 . |
| | 25 | 09 64 322 721 . | 09 64 312 721 . |
| | 37 | 09 64 422 721 . | 09 64 412 721 . |
| Connectors with **470 pF** C filter | 9 | 09 64 122 722 . | 09 64 112 722 . |
| | 15 | 09 64 222 722 . | 09 64 212 722 . |
| | 25 | 09 64 322 722 . | 09 64 312 722 . |
| | 37 | 09 64 422 722 . | 09 64 412 722 . |
| Connectors with **1000 pF** C filter | 9 | 09 64 122 723 . | 09 64 112 723 . |
| | 15 | 09 64 222 723 . | 09 64 212 723 . |
| | 25 | 09 64 322 723 . | 09 64 312 723 . |
| | 37 | 09 64 422 723 . | 09 64 412 723 . |
| Connectors with **3900 pF** C filter | 9 | 09 64 122 724 . | 09 64 112 724 . |
| | 15 | 09 64 222 724 . | 09 64 212 724 . |
| | 25 | 09 64 322 724 . | 09 64 312 724 . |
| | 37 | 09 64 422 724 . | 09 64 412 724 . |
| Please insert digit for flange thread<br>4-40 UNC ▶ 5<br>M3 ▶ 6 | | | |

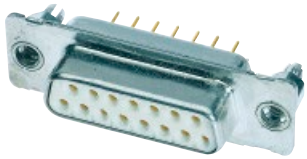


Downloaded from Arrow.com.

Number of contacts

# 9–37

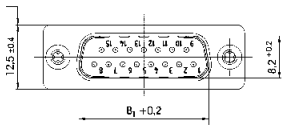
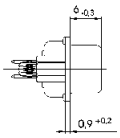
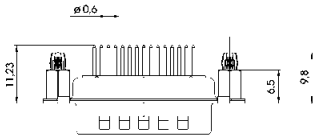
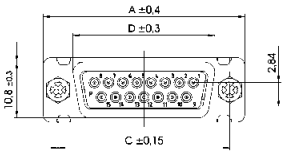




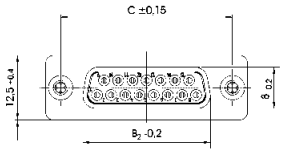
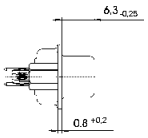
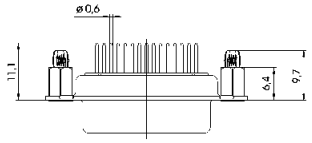
## Turned solder pins, straight, straight board clips

| Identification | Drawing | Dimensions in mm |
|---|---|---|

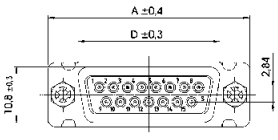
Male connector

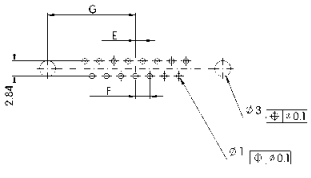
Female connector

| No. of contacts | A | $B_1$ | $B_2$ | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|
| 9 | 30.8 | 16.9 | 16.4 | 25.00 | 19.3 | 1.37 | 2.74 | 12.50 |
| 15 | 39.1 | 25.2 | 24.7 | 33.30 | 27.5 | 1.37 | 2.74 | 16.65 |
| 25 | 53.0 | 38.9 | 38.5 | 47.04 | 41.3 | 1.40 | 2.77 | 23.52 |
| 37 | 69.3 | 55.3 | 54.9 | 63.50 | 57.7 | 1.40 | 2.77 | 31.75 |



Board drillings





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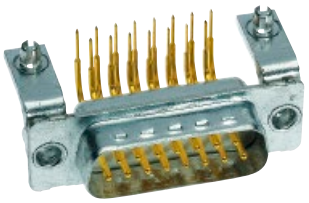
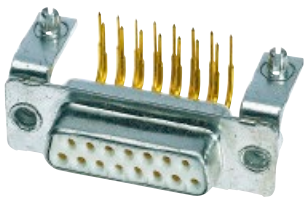
Number of contacts

# 9–37

## Turned solder pins, right angled, bracket, board lock and clinch nut

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with **47 pF** C filter | 9 | 09 64 124 721 . | 09 64 114 721 . |
| | 15 | 09 64 224 721 . | 09 64 214 721 . |
| | 25 | 09 64 324 721 . | 09 64 314 721 . |
| | 37 | 09 64 424 721 . | 09 64 414 721 . |
| Connectors with **470 pF** C filter | 9 | 09 64 124 722 . | 09 64 114 722 . |
| | 15 | 09 64 224 722 . | 09 64 214 722 . |
| | 25 | 09 64 324 722 . | 09 64 314 722 . |
| | 37 | 09 64 424 722 . | 09 64 414 722 . |
| Connectors with **1000 pF** C filter | 9 | 09 64 124 723 . | 09 64 114 723 . |
| | 15 | 09 64 224 723 . | 09 64 214 723 . |
| | 25 | 09 64 324 723 . | 09 64 314 723 . |
| | 37 | 09 64 424 723 . | 09 64 414 723 . |
| Connectors with **3900 pF** C filter | 9 | 09 64 124 724 . | 09 64 114 724 . |
| | 15 | 09 64 224 724 . | 09 64 214 724 . |
| | 25 | 09 64 324 724 . | 09 64 314 724 . |
| | 37 | 09 64 424 724 . | 09 64 414 724 . |
| Please insert digit for flange thread<br>4-40 UNC ▶ 2<br>M3 ▶ 3 | | | |



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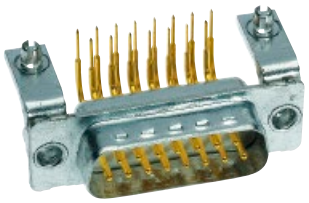
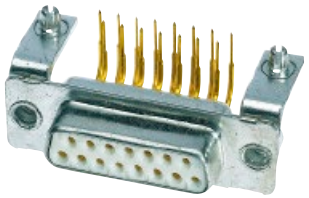
Number of contacts

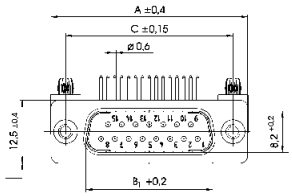
# 9–37

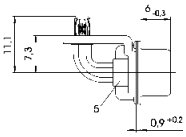



Turned solder pins, right angled, bracket, board lock and clinch nut

| Identification | Drawing | Dimensions in mm |
|---|---|---|

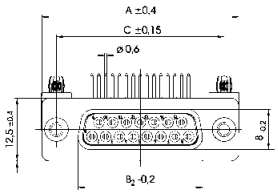
## Male connector

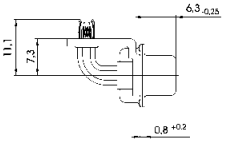


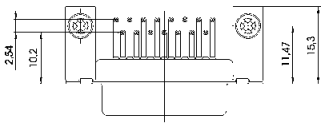



| No. of contacts | A | $B_1$ | $B_2$ | C | E | F |
|---|---|---|---|---|---|---|
| 9 | 30.8 | 16.9 | 16.4 | 25.00 | 1.37 | 2.74 |
| 15 | 39.1 | 25.2 | 24.7 | 33.30 | 1.37 | 2.74 |
| 25 | 53.0 | 38.9 | 38.5 | 47.04 | 1.40 | 2.77 |
| 37 | 69.3 | 55.3 | 54.9 | 63.50 | 1.40 | 2.77 |

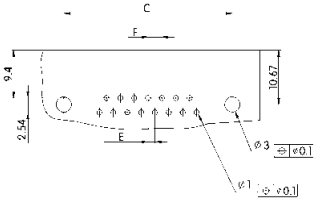
## Female connector




## Board drillings



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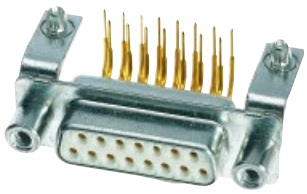
Number of contacts

# 9–37



## Turned solder pins, right angled, bracket, board lock and female screw

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with **47 pF** C filter | 9 | 09 64 124 721 . | 09 64 114 721 . |
| | 15 | 09 64 224 721 . | 09 64 214 721 . |
| | 25 | 09 64 324 721 . | 09 64 314 721 . |
| | 37 | 09 64 424 721 . | 09 64 414 721 . |
| Connectors with **470 pF** C filter | 9 | 09 64 124 722 . | 09 64 114 722 . |
| | 15 | 09 64 224 722 . | 09 64 214 722 . |
| | 25 | 09 64 324 722 . | 09 64 314 722 . |
| | 37 | 09 64 424 722 . | 09 64 414 722 . |
| Connectors with **1000 pF** C filter | 9 | 09 64 124 723 . | 09 64 114 723 . |
| | 15 | 09 64 224 723 . | 09 64 214 723 . |
| | 25 | 09 64 324 723 . | 09 64 314 723 . |
| | 37 | 09 64 424 723 . | 09 64 414 723 . |
| Connectors with **3900 pF** C filter | 9 | 09 64 124 724 . | 09 64 114 724 . |
| | 15 | 09 64 224 724 . | 09 64 214 724 . |
| | 25 | 09 64 324 724 . | 09 64 314 724 . |
| | 37 | 09 64 424 724 . | 09 64 414 724 . |
| Please insert digit for flange thread<br>4-40 UNC ▶ 4<br>M3 ▶ 5 | | | |



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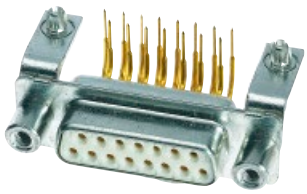
Number of contacts

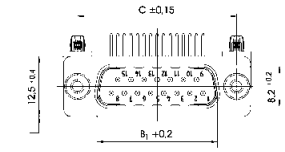
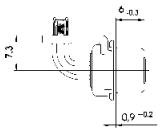
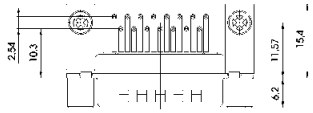
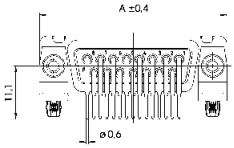
# 9–37



Turned solder pins, right angled, bracket, board lock and female screw

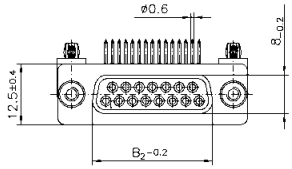
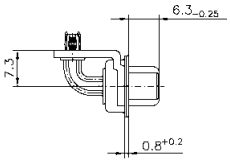
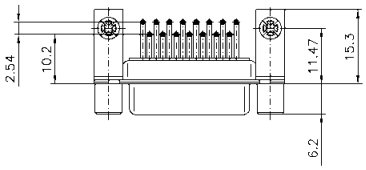
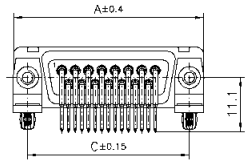
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

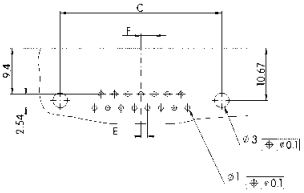





| No. of contacts | A | $B_1$ | $B_2$ | C | E | F |
|---|---|---|---|---|---|---|
| 9 | 30.8 | 16.9 | 16.4 | 25.00 | 1.37 | 2.74 |
| 15 | 39.1 | 25.2 | 24.7 | 33.30 | 1.37 | 2.74 |
| 25 | 53.0 | 38.9 | 38.5 | 47.04 | 1.40 | 2.77 |
| 37 | 69.3 | 55.3 | 54.9 | 63.50 | 1.40 | 2.77 |

## Female connector

## Board drillings





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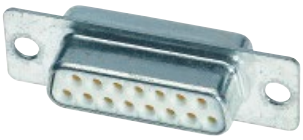
Number of contacts

# 9–37



## Solder buckets, through hole

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with **47 pF** C filter | 9 | 09 64 121 7210 | 09 64 111 7210 |
| | 15 | 09 64 221 7210 | 09 64 211 7210 |
| | 25 | 09 64 321 7210 | 09 64 311 7210 |
| | 37 | 09 64 421 7210 | 09 64 411 7210 |
| Connectors with **470 pF** C filter | 9 | 09 64 121 7220 | 09 64 111 7220 |
| | 15 | 09 64 221 7220 | 09 64 211 7220 |
| | 25 | 09 64 321 7220 | 09 64 311 7220 |
| | 37 | 09 64 421 7220 | 09 64 411 7220 |
| Connectors with **1000 pF** C filter | 9 | 09 64 121 7230 | 09 64 111 7230 |
| | 15 | 09 64 221 7230 | 09 64 211 7230 |
| | 25 | 09 64 321 7230 | 09 64 311 7230 |
| | 37 | 09 64 421 7230 | 09 64 411 7230 |
| Connectors with **3900 pF** C filter | 9 | 09 64 121 7240 | 09 64 111 7240 |
| | 15 | 09 64 221 7240 | 09 64 211 7240 |
| | 25 | 09 64 321 7240 | 09 64 311 7240 |
| | 37 | 09 64 421 7240 | 09 64 411 7240 |



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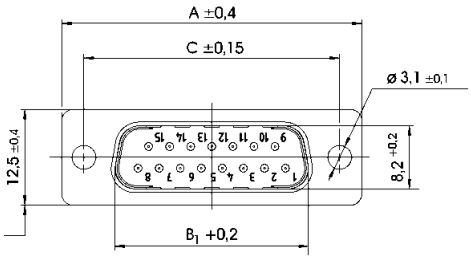
Number of contacts

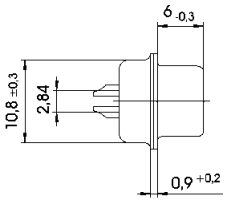
# 9–37

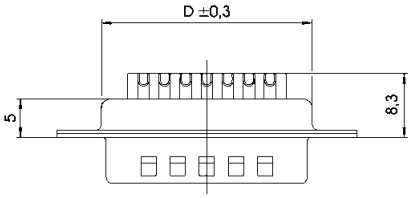
## Solder buckets, through hole

| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Male connector

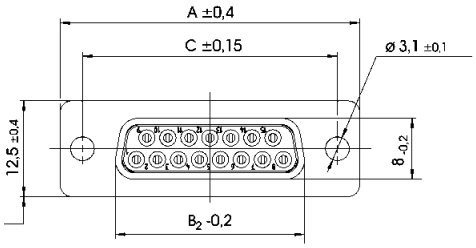


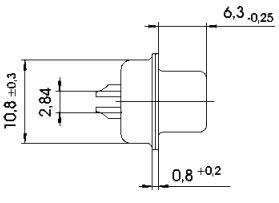



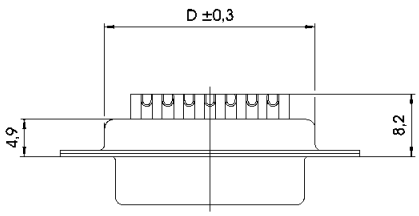




| No. of contacts | A | $B_1$ | $B_2$ | C | D |
|---|---|---|---|---|---|
| 9 | 30.8 | 16.9 | 16.4 | 25.00 | 19.3 |
| 15 | 39.1 | 25.2 | 24.7 | 33.30 | 27.5 |
| 25 | 53.0 | 38.9 | 38.5 | 47.04 | 41.3 |
| 37 | 69.3 | 55.3 | 54.9 | 63.50 | 57.7 |

### Female connector




Panel cut outs see page 05.110



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Number of contacts

# 9–37

## Solder buckets, clinch nut

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | male connectors | female connectors |
| Connectors with **47 pF** C filter | 9 | 09 64 121 721 . | 09 64 111 721 . |
| | 15 | 09 64 221 721 . | 09 64 211 721 . |
| | 25 | 09 64 321 721 . | 09 64 311 721 . |
| | 37 | 09 64 421 721 . | 09 64 411 721 . |
| Connectors with **470 pF** C filter | 9 | 09 64 121 722 . | 09 64 111 722 . |
| | 15 | 09 64 221 722 . | 09 64 211 722 . |
| | 25 | 09 64 321 722 . | 09 64 311 722 . |
| | 37 | 09 64 421 722 . | 09 64 411 722 . |
| Connectors with **1000 pF** C filter | 9 | 09 64 121 723 . | 09 64 111 723 . |
| | 15 | 09 64 221 723 . | 09 64 211 723 . |
| | 25 | 09 64 321 723 . | 09 64 311 723 . |
| | 37 | 09 64 421 723 . | 09 64 411 723 . |
| Connectors with **3900 pF** C filter | 9 | 09 64 121 724 . | 09 64 111 724 . |
| | 15 | 09 64 221 724 . | 09 64 211 724 . |
| | 25 | 09 64 321 724 . | 09 64 311 724 . |
| | 37 | 09 64 421 724 . | 09 64 411 724 . |
| Please insert digit for flange thread<br>4-40 UNC ▶ 7<br>M3 ▶ 8 | | | |



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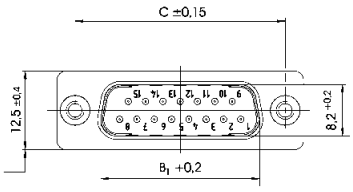
Number of contacts

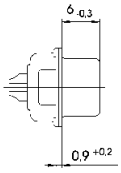
# 9–37

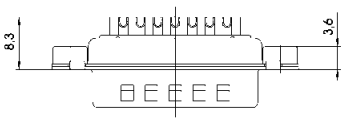
## Solder buckets, clinch nut

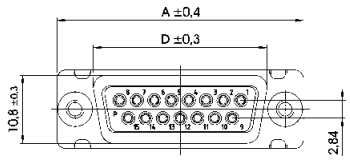
| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Male connector



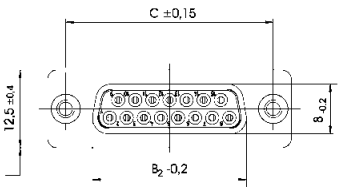



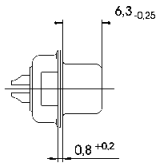



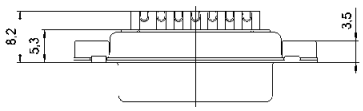



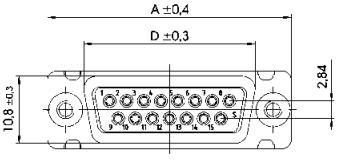

| No. of contacts | A | $B_1$ | $B_2$ | C | D |
|---|---|---|---|---|---|
| 9 | 30.8 | 16.9 | 16.4 | 25.00 | 19.3 |
| 15 | 39.1 | 25.2 | 24.7 | 33.30 | 27.5 |
| 25 | 53.0 | 38.9 | 38.5 | 47.04 | 41.3 |
| 37 | 69.3 | 55.3 | 54.9 | 63.50 | 57.7 |

### Female connector




Panel cut outs see page 05.110



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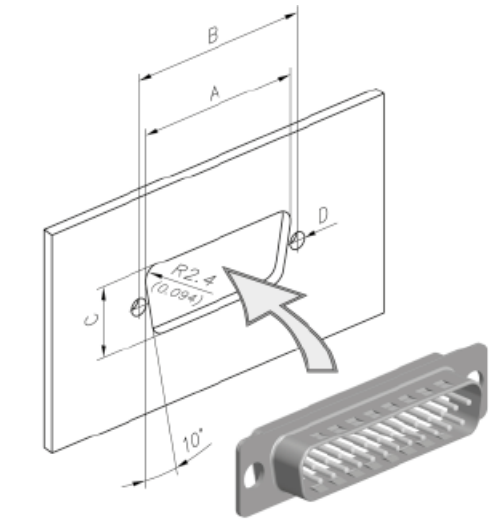
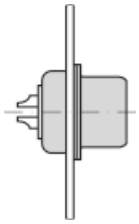
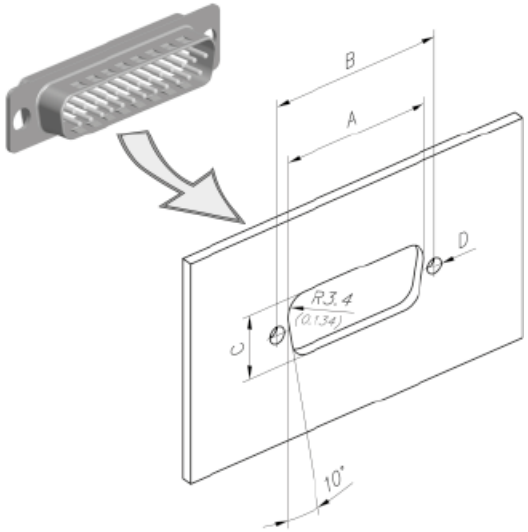
# Panel cut outs / panel mountings

## Panel cut outs

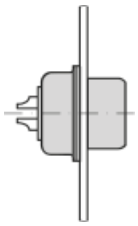



Front mounting



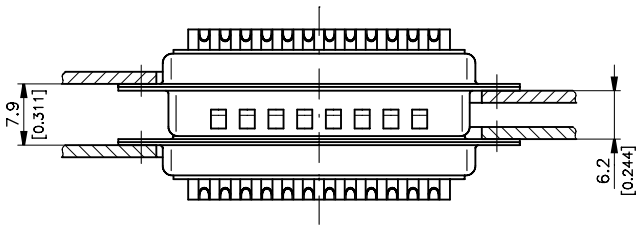


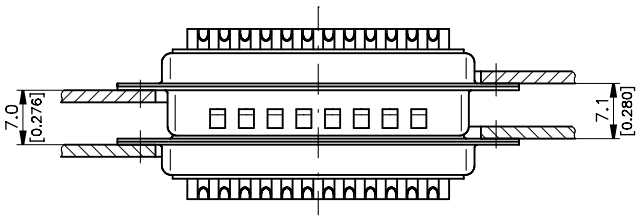

Rear mounting



| No. of contacts | Mounting assembly | A ± 0.2 | B ± 0.2 | C ± 0.2 |
|---|---|---|---|---|
| 9 | Front | 22.2 | 25.0 | 12.3 |
| | Rear | 20.5 | 25.0 | 11.4 |
| 15 | Front | 30.5 | 33.3 | 12.3 |
| | Rear | 28.8 | 33.3 | 11.4 |
| 25 | Front | 44.3 | 47.0 | 12.3 |
| | Rear | 42.5 | 47.0 | 11.4 |
| 37 | Front | 60.7 | 63.5 | 12.3 |
| | Rear | 59.1 | 63.5 | 11.4 |

## Panel mountings




For float mounting option please contact your local HARTING representative.

Dimensions in mm



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# General information

With the innovative EMC platform approach, this enables customers to select their optimum filter requirements, contact per contact. Allowing not only to segregate the filtering per contact but also to mix the type of filter used. This is then cast in a single competitive product (in a standard D-Sub shell).

The biggest advantage of the HARTING technology is that multiple filter assemblies can be configured to create different filter designs: C, Pi, L and T types. Since any value of capacitor can be placed on any contact, a wide range of configurations can be built, it is even possible to have an individual pin unfiltered if necessary.

Furthermore, ***Pi filters can be supplied in a standard connector size shell***. In addition, protection against lightening and transient voltage can be included upon request.

In the next few pages, you will find all the necessary information plus a selection guide to help you to choose your appropriate solution.

**or**

+

- C filter
- L filter
- Pi filter
- ESD protection
- Lightening protection
- Combination

With any capacitance on any pin in **a standard D-Sub shell**.

All types of filter mixed D-Sub are also available on request.





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# General information

## Filter possibilities

### C filter:

Non exhaustive list of C filter values that HARTING can supply (for specials see page 05.114 ff)

| C filter capacitance in pF | Minimum insertion loss Attenuation [dB] vs frequency [MHz] | | | | | | | | Max. working voltage | Max. dielectric withstanding |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.1 | 1 | 5 | 10 | 50 | 100 | 500 | 1000 | | |
| 47 | | | | | | | 30 | 35 | 500 V DC | 750 V DC |
| 100 | | | | | 1 | 3 | 40 | 35 | 500 V DC | 750 V DC |
| 150 | | | | | 1 | 6 | 45 | 35 | 500 V DC | 750 V DC |
| 180 | | | | | 1 | 10 | 40 | 32 | 500 V DC | 750 V DC |
| 270 | | | | 1 | 3 | 12 | 35 | 32 | 500 V DC | 750 V DC |
| 330 | | | | 1 | 7 | 13 | 35 | 32 | 500 V DC | 750 V DC |
| 470 | | | | 1 | 10 | 15 | 35 | 32 | 500 V DC | 750 V DC |
| 820 | | | | 2 | 10 | 18 | 30 | 30 | 500 V DC | 750 V DC |
| 1000 | | | 1 | 3 | 12 | 20 | 34 | 30 | 500 V DC | 750 V DC |
| 1800 | | | 2 | 6 | 17 | 30 | 35 | 32 | 500 V DC | 750 V DC |
| 3900 | | 1 | 6 | 11 | 25 | 35 | 35 | 32 | 500 V DC | 750 V DC |
| 4700 | | 1 | 9 | 13 | 30 | 38 | 35 | 32 | 500 V DC | 750 V DC |
| 5600 | | 2 | 10 | 14 | 30 | 32 | 32 | 32 | 500 V DC | 750 V DC |
| 10000 | | 1 | 10 | 15 | 30 | 32 | 30 | 30 | 200 V DC | 500 V DC |
| 33000 | 1 | 9 | 19 | 29 | 32 | 34 | 39 | 32 | 100 V DC | 150 V DC |
| 47000 | 1 | 11 | 23 | 30 | 32 | 32 | 35 | 32 | 100 V DC | 150 V DC |
| 100000 | 2 | 18 | 32 | 40 | 34 | 34 | 36 | 35 | 25 V DC | 40 V DC |

### Pi filter:

Non exhaustive list of Pi filter values that HARTING can supply (for specials see page 05.114 ff)

| Pi filter capacitance in pF | Minimum insertion loss Attenuation [dB] vs frequency [MHz] | | | | | | | | Max. working voltage | Max. dielectric withstanding |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.1 | 1 | 5 | 10 | 50 | 100 | 500 | 1000 | | |
| 94 | | | | | | 2 | 35 | 50 | 200 V DC | 500 V DC |
| 200 | | | | | 1 | 8 | 50 | 40 | 200 V DC | 500 V DC |
| 440 | | | | 1 | 8 | 16 | 50 | 40 | 200 V DC | 500 V DC |
| 940 | | | | 2 | 12 | 24 | 50 | 40 | 200 V DC | 500 V DC |
| 2000 | | | 2 | 7 | 17 | 40 | 45 | 40 | 200 V DC | 500 V DC |
| 4400 | | | 5 | 10 | 28 | 60 | 45 | 40 | 200 V DC | 500 V DC |
| 9400 | | 2 | 10 | 15 | 48 | 50 | 45 | 40 | 200 V DC | 500 V DC |
| 20000 | | 5 | 14 | 20 | 50 | 60 | 52 | 48 | 100 V DC | 250 V DC |
| 94000 | 2 | 15 | 32 | 50 | 51 | 52 | 48 | 42 | 50 V DC | 125 V DC |
| 200000 | 7 | 21 | 48 | 65 | 55 | 52 | 48 | 42 | 16 V DC | 25 V DC |



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# General information

## Other protection possibilities

### ESD protection

(Electro Static Discharge protection)

For equipment to comply with:

- IEC-1000-4-2; levels 1 to 4 (Contact discharge test)
- RTCA-160 D; section 25

| Typical parasitic capacitance (pF) | Max. clamp voltage (V) | Working voltage (V) |
|---|---|---|
| 0.5 $V_{rms}$ @ 1 KHz | @ I = 1 A @ 8/20 µS | @ I = 10 µA |
| 1750 | 7.5 | 3 |
| 1250 | 13 | 5 |
| 650 | 22 | 12 |
| 430 | 33 | 18 |
| 220 | 48 | 26 |
| 200 | 51 | 30 |

### EMP protection

(Electro Magnetic Pulse protection)

For equipment to comply with:

- MIL-STD-461 C: requirements CS 06, CS 10, CS 11, RS 05
- IEC-1000-4-4; EFT TESTS
- RTCA-160 D; section 17

| Typical parasitic capacitance (pF) | Max. clamp voltage (V) | Working voltage (V) |
|---|---|---|
| 0.5 $V_{rms}$ @ 1 KHz | @ I = 10 A @ 8/20 µS | @ I = 10 µA |
| 5675 | 9 | 3 |
| 3620 | 15 | 5 |
| 1500 | 26 | 14 |
| 820 | 34 | 18 |
| 275 | 50 | 26 |

### Lightening protection

For equipment to comply with:

- IEC-1000-4-5; levels 1 and 2 (1.2 µ / 50 µS)
- RTCA-160 D; section 22 (pin injection, level 1)

| Typical parasitic capacitance (pF) | Max. clamp voltage (V) | Working voltage (V) |
|---|---|---|
| 0.5 $V_{rms}$ @ 1 KHz | @ I = 30 A @ 8/20 µS | @ I = 10 µA |
| 5500 | 12 | 3 |
| 3175 | 18 | 5 |
| 2000 | 21 | 9 |
| 1680 | 30 | 14 |
| 900 | 38 | 18 |
| 720 | 60 | 26 |
| 600 | 63 | 30 |





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# HARTING customer request form

Our innovative technology offers all the possibilities you may need.

For customer solutions, please contact your local HARTING representative.

Here is a summary of the information we need to develop a customer solution:

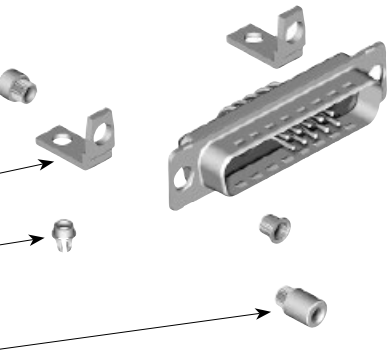
## Connector

| | | |
|---|---|---|
| Standard D-Sub | Gender | ☐ Male ☐ Female |
| | No. of contacts | ☐ 9 ☐ 15 ☐ 25 ☐ 37 ☐ 50 |
| | Termination | ☐ Solder bucket ☐ Straight pcb |
| | | ☐ R/A Eur, 2.54 mm ☐ R/A US, 2.84 mm |
| Mixed D-Sub | Gender | ☐ Male ☐ Female |
| | Contact arrangement | ☐ 3W3 ☐ 3W3C ☐ Other _____ |
| | Power contact rating | ☐ 10 A ☐ 20 A ☐ 30 A ☐ 40 A |
| | Termination | ☐ Solder bucket ☐ Straight pcb |
| | | ☐ R/A pcb (please specify the board drillings) |

## Flange thread and board locking options

**Right angled version**

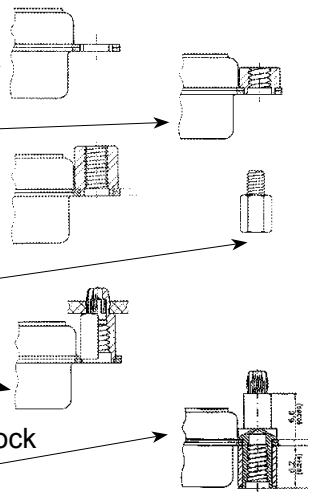
☐ Through hole
☐ Clinch nut 4-40 UNC
☐ Clinch nut M3
☐ Bracket
☐ Board lock
☐ Female screw lock 4-40 UNC
☐ Female screw lock M3



**Straight version**

☐ Through hole
☐ Clinch nut 4-40 UNC
☐ Clinch nut M3
☐ Spacer 4-40 UNC
☐ Spacer M3
☐ Female screw lock 4-40 UNC
☐ Spacer 4-40 UNC + board lock
☐ Spacer M3 + board lock

Spacer + board lock and female screw lock
☐ M3 ☐ 4-40 UNC





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# HARTING customer request from

## Filter

What working voltage is used? _____

What is the maximum dielectric withstanding voltage needed? _____

Type of filter _____ (C filter, Pi filter*, L filter …)

Capacitance _____

Are there other protections needed? ☐ No ☐ Yes ☐ ESD ☐ Transient ☐ EMP ☐ Lightening

If a pin-to-pin selection has to be done, please state the details Pin 1: ?, Pin 2: ?, …

_____

| | |
|---|---|
| Name: | Drawing: ☐ no ☐ yes |
| Company: | Samples: ☐ no ☐ yes, quantity |
| Address: | Volume (pcs./year): |
| | |
| Phone: | Special requirements: |
| Fax: | |
| E-Mail: | |





* only available for male connectors

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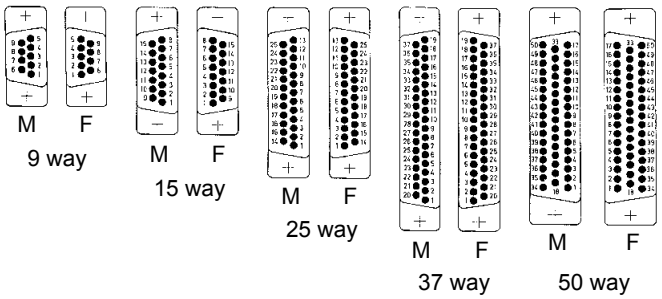
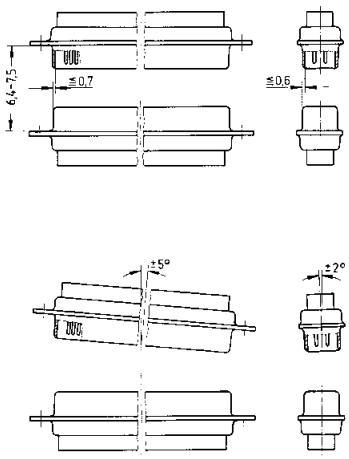
| | |
|---|---|
| **Number of contacts** | 9, 15, 25, 37, 50<br>UL recognized |
| **Working current** | 5 A |
| **Test voltage**<br>between 2 contacts / contact and shell | 1200 V for 1 minute |
| **Clearance and creepage** | ≥ 1.0 mm |
| **Contact resistance** | |
| Straight contact | ≤ 10 mΩ |
| Angled contact | ≤ 25 mΩ |
| Angled contact 50-pole | ≤ 35 mΩ |
| **Insulation resistance** | |
| between contacts | ≥ 5000 MΩ |
| **Dielectric strength** | 50 kV/mm |
| **Temperature range** | -25 °C … +70 °C |
| **Protection** | IP67<br>(per DIN 40 050 / IEC 529) |
| **Termination** | |
| Solder cup | max. AWG 20 |
| Solder pin straight | 0.6 mm diameter |
| Solder pin angled | 0.6 mm diameter |
| **Material** | |
| Shell | Brass, tin plated |
| Insulator and plastic watertight frame | Thermoplastic,<br>glass-fibre filled, UL 94-V0 |
| Metal watertight frame | Nickel plated zinc die cast |
| Contact material | Machined copper alloy |
| **Contact surface** | |
| Contact zone | S4 = 0.76 µm (30 µinch) Au<br>or PdNi equivalent |
| Waterproofing element | Silicone |
| **Mechanical** | |
| Mating cycles | ≥ 500 |
| Mating force per signal contact | ≤ 3.4 N |
| Unmating force per signal contact | ≥ 0.2 N |

## Contact arrangement View from termination side




M = Male connector
F = Female connector

## Mating conditions as per DIN 41 652



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# Notes





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Number of contacts

# 9–50

## IP67, turned solder cups

| Identification | No. of contacts | Part number |
|---|---|---|
| | | S4[1)] |
| Male connector<br>metal shell with dimples | 9 | 09 67 409 5615 |
| | 15 | 09 67 415 5615 |
| | 25 | 09 67 425 5615 |
| | 37 | 09 67 437 5615 |
| | 50 | 09 67 450 5615 |
| Female connector<br>metal shell | 9 | 09 67 409 4715 |
| | 15 | 09 67 415 4715 |
| | 25 | 09 67 425 4715 |
| | 37 | 09 67 437 4715 |
| | 50 | 09 67 450 4715 |

[1)] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent



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Number of contacts

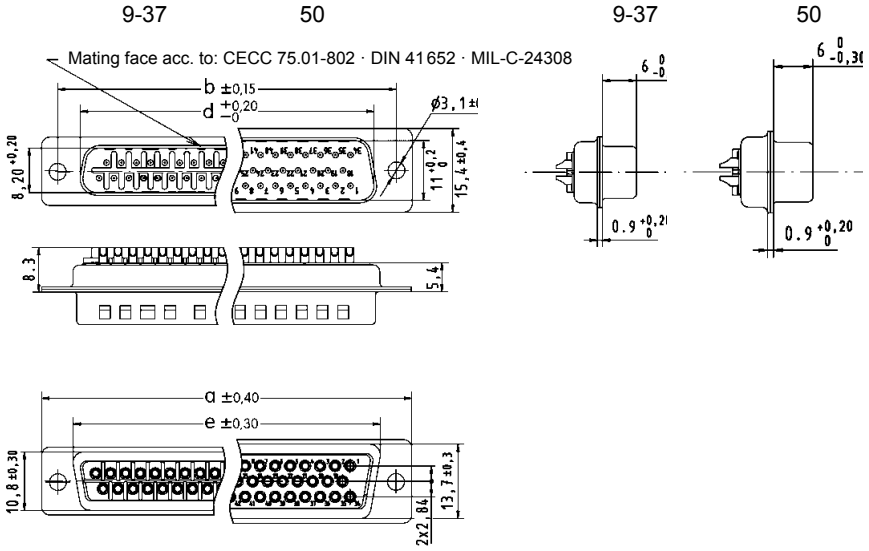
# 9–50

IP67, turned solder cups

| Identification | Drawing | Dimensions in mm |
|---|---|---|

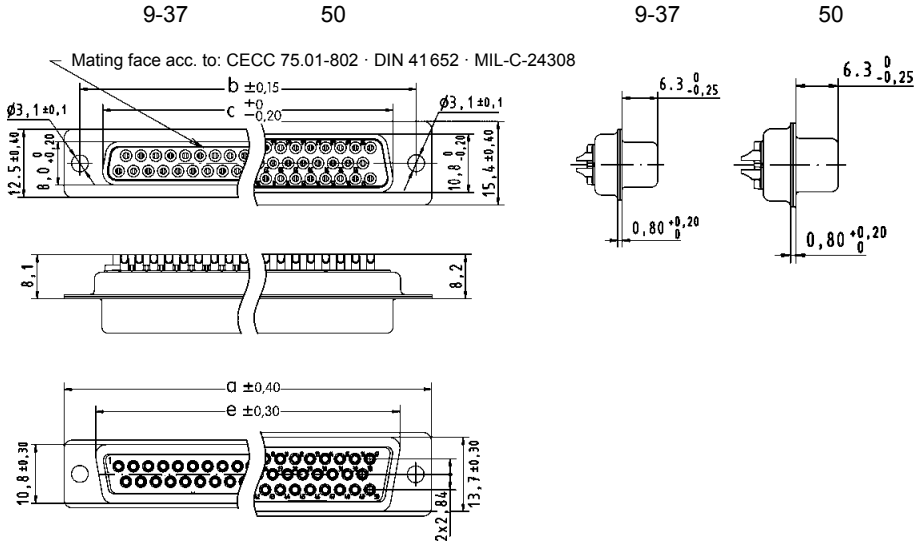
## Male connector

9 – 50 contacts




## Female connector

9 – 50 contacts




| | a | b | c | d | e |
|---|---|---|---|---|---|
| 9 | 30.8 | 25.00 | 16.4 | 16.9 | 19.3 |
| 15 | 39.1 | 33.30 | 24.7 | 25.2 | 27.5 |
| 25 | 53.0 | 47.04 | 38.5 | 38.9 | 41.3 |
| 37 | 69.3 | 63.50 | 54.9 | 55.3 | 57.7 |
| 50 | 66.9 | 61.10 | 52.5 | 52.8 | 55.3 |



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Number of contacts

# 9–25

## IP67, turned solder cups, with rear plastic mounting plate

| Identification | No. of contacts | Part number S4[1] |
|---|---|---|
| **Male connector**<br>metal shell with dimples | | |
| | 9 | 09 67 509 . 615 |
| | 15 | 09 67 515 . 615 |
| | 25 | 09 67 525 . 615 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 7 | | |
| M3 ▶ 9 | | |
| **Female connector**<br>metal shell | | |
| | 9 | 09 67 509 . 715 |
| | 15 | 09 67 515 . 715 |
| | 25 | 09 67 525 . 715 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 6 | | |
| M3 ▶ 8 | | |

[1] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent



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Number of contacts

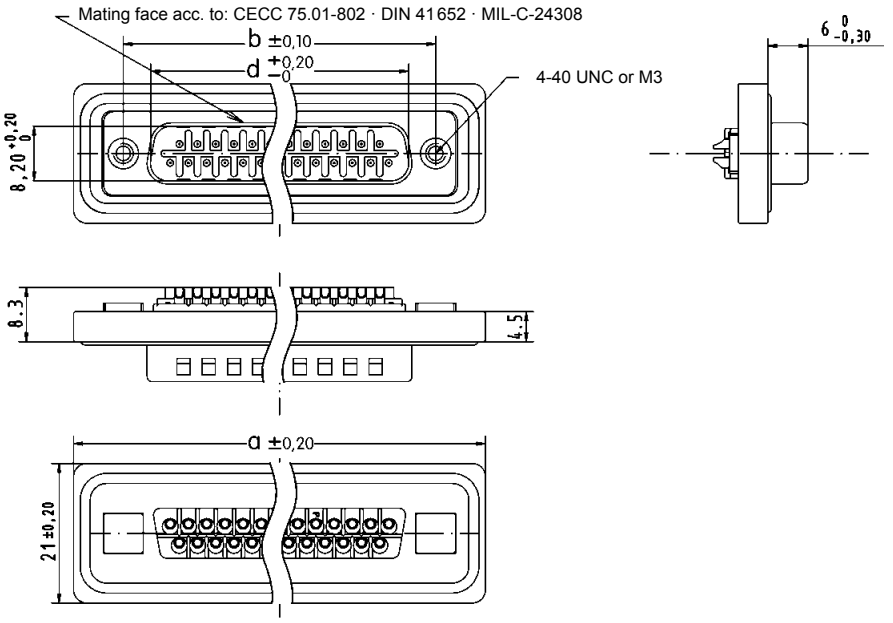
# 9–25

IP67, turned solder cups, with rear plastic mounting plate

| Identification | Drawing | Dimensions in mm |
|---|---|---|

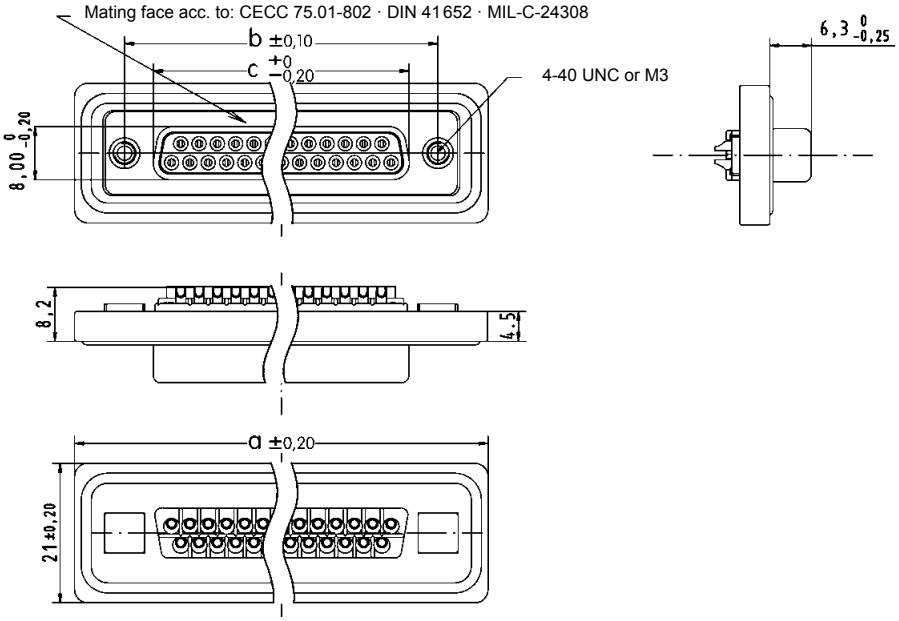
## Male connector

9 – 25 contacts




## Female connector

9 – 25 contacts




| | a | b | c | d |
|---|---|---|---|---|
| 9 | 40.0 | 25.00 | 16.4 | 16.9 |
| 15 | 48.3 | 33.30 | 24.7 | 25.2 |
| 25 | 62.0 | 47.04 | 38.5 | 38.9 |



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Number of contacts

# 9–25

IP67, turned solder cups, with front plastic mounting plate

| Identification | No. of contacts | Part number S4[1)] |
|---|---|---|
| **Male connector** metal shell with dimples | | |
| | 9 | 09 67 709 . 615 |
| | 15 | 09 67 715 . 615 |
| | 25 | 09 67 725 . 615 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ | 7 | |
| M3 ▶ | 9 | |
| **Female connector** metal shell | | |
| | 9 | 09 67 709 . 715 |
| | 15 | 09 67 715 . 715 |
| | 25 | 09 67 725 . 715 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ | 6 | |
| M3 ▶ | 8 | |

[1)] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent



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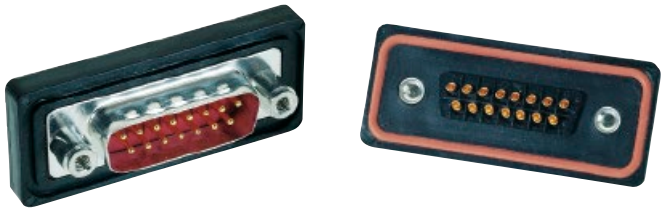
Number of contacts

# 9–25

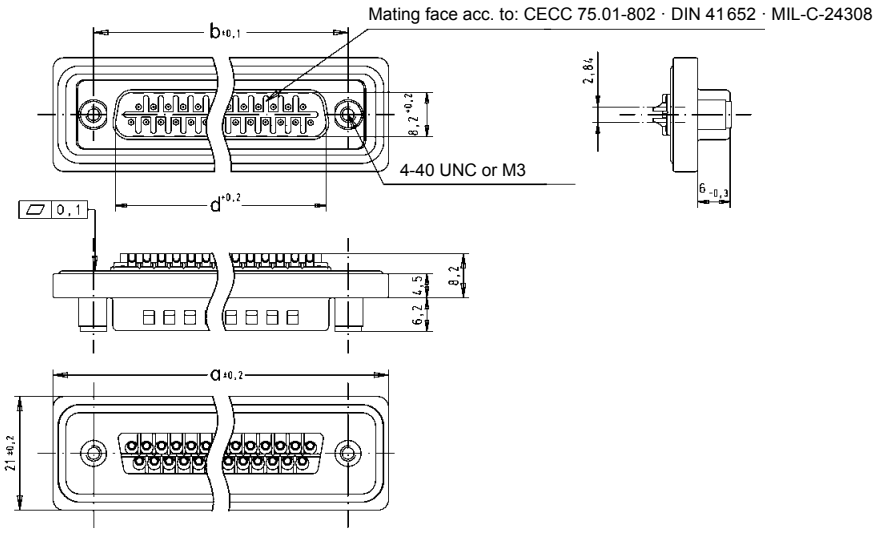


IP67, turned solder cups, with front plastic mounting plate

| Identification | Drawing | Dimensions in mm |
|---|---|---|

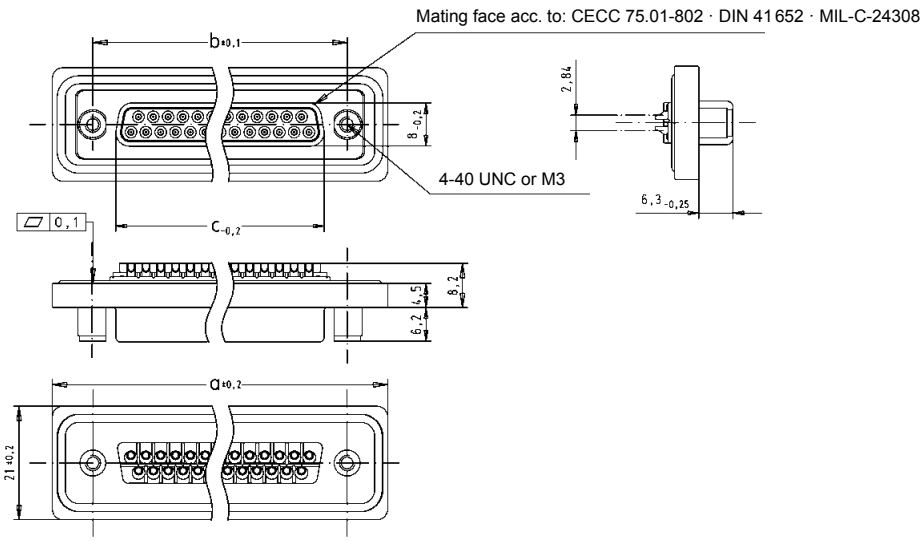
## Male connector

9 – 25 contacts




## Female connector

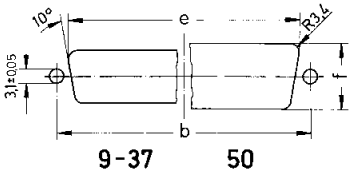
9 – 25 contacts




| | a | b | c | d |
|---|---|---|---|---|
| 9 | 40.0 | 25.00 | 16.4 | 16.9 |
| 15 | 48.3 | 33.30 | 24.7 | 25.2 |
| 25 | 62.0 | 47.04 | 38.5 | 38.9 |

## Panel cut out for front/rear mount

Values are taken from the CECC 75301-802




Front mount

| | $b_{\pm 0.13}$ | $e_{\pm 0.2}$ | $f_{\pm 0.2}$ |
|---|---|---|---|
| 9 | 25.0 | 22.2 | 12.3 |
| 15 | 33.3 | 30.5 | 12.3 |
| 25 | 47.0 | 44.3 | 12.3 |

Rear mount

| | $b_{\pm 0.13}$ | $e_{\pm 0.2}$ | $f_{\pm 0.2}$ |
|---|---|---|---|
| 9 | 25.0 | 20.5 | 11.4 |
| 15 | 33.3 | 28.8 | 11.4 |
| 25 | 47.0 | 42.5 | 11.4 |



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Number of contacts

# 9–50

## IP67, turned solder cups, with rear metal mounting plate

| Identification | No. of contacts | Part number S4[1] |
|---|---|---|
| **Male connector** metal shell with dimples | | |
| | 9 | 09 67 609 . 615 |
| | 15 | 09 67 615 . 615 |
| | 25 | 09 67 625 . 615 |
| | 37 | 09 67 637 . 615 |
| | 50 | 09 67 650 . 615 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 7 | | |
| M3 ▶ 9 | | |
| **Female connector** metal shell | | |
| | 9 | 09 67 609 . 715 |
| | 15 | 09 67 615 . 715 |
| | 25 | 09 67 625 . 715 |
| | 37 | 09 67 637 . 715 |
| | 50 | 09 67 650 . 715 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 6 | | |
| M3 ▶ 8 | | |

[1] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent



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Number of contacts

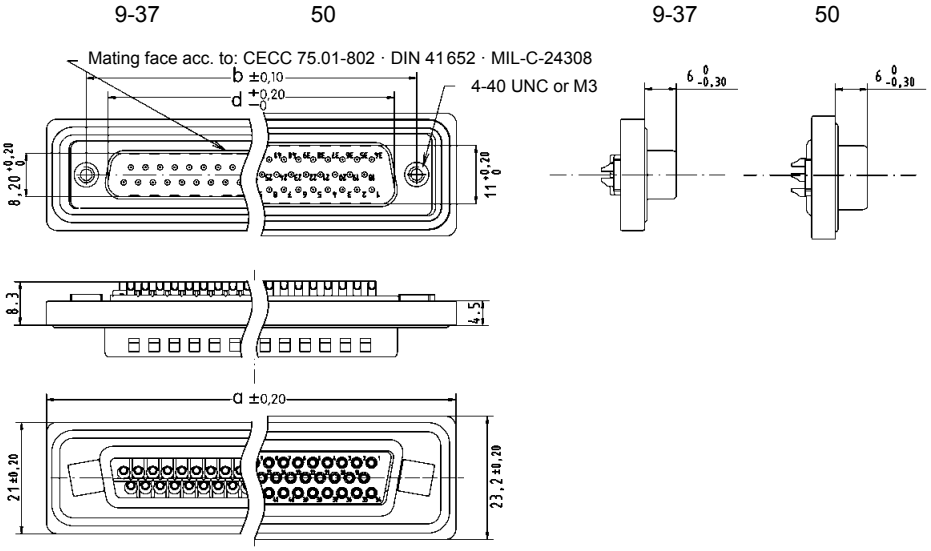
# 9–50

IP67, turned solder cups, with rear metal mounting plate

| Identification | Drawing | Dimensions in mm |
|---|---|---|

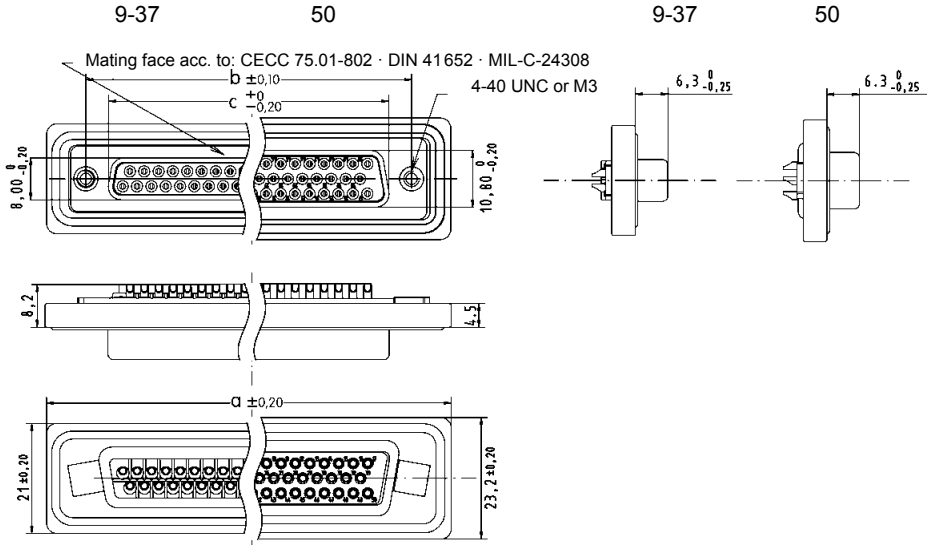
## Male connector

9 – 50 contacts




## Female connector

9 – 50 contacts




| | a | b | c | d |
|---|---|---|---|---|
| 9 | 40,0 | 25,00 | 16,4 | 16,9 |
| 15 | 48,3 | 33,30 | 24,7 | 25,2 |
| 25 | 62,0 | 47,04 | 38,5 | 38,9 |
| 37 | 78,5 | 63,50 | 54,9 | 55,3 |
| 50 | 76,1 | 61,10 | 52,5 | 52,8 |



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Number of contacts

# 9–50

IP67, turned solder cups, with front metal mounting plate

| Identification | No. of contacts | Part number |
|---|---|---|
| | | S4[1] |
| **Male connector** metal shell with dimples | | |
| | 9 | 09 67 809 . 615 |
| | 15 | 09 67 815 . 615 |
| | 25 | 09 67 825 . 615 |
| | 37 | 09 67 837 . 615 |
| | 50 | 09 67 850 . 615 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 7 | | |
| M3 ▶ 9 | | |
| **Female connector** metal shell | | |
| | 9 | 09 67 809 . 715 |
| | 15 | 09 67 815 . 715 |
| | 25 | 09 67 825 . 715 |
| | 37 | 09 67 837 . 715 |
| | 50 | 09 67 850 . 715 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 6 | | |
| M3 ▶ 8 | | |

[1] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent



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Number of contacts

# 9–50

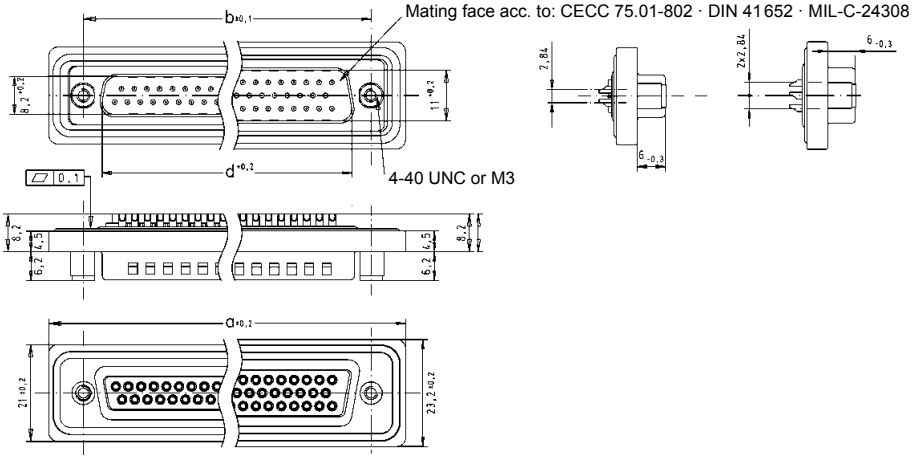
IP67, turned solder cups, with front metal mounting plate

| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

9 – 50 contacts

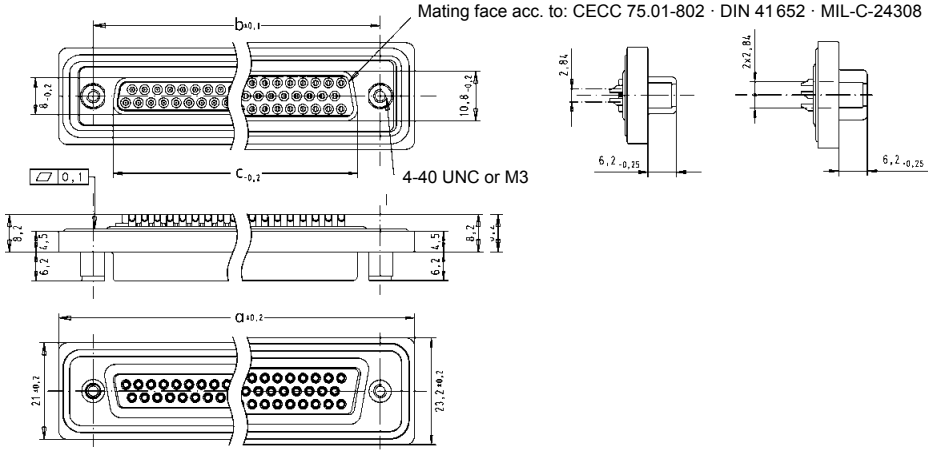
9-37 50 9-37 50




## Female connector

9 – 50 contacts

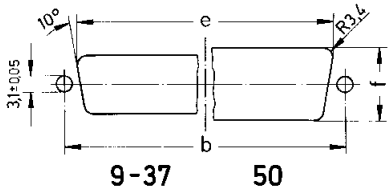
9-37 50 9-37 50




| | a | b | c | d |
|---|---|---|---|---|
| 9 | 40.0 | 25.00 | 16.4 | 16.9 |
| 15 | 48.3 | 33.30 | 24.7 | 25.2 |
| 25 | 62.0 | 47.04 | 38.5 | 38.9 |
| 37 | 78.5 | 63.50 | 54.9 | 55.3 |
| 50 | 76.1 | 61.10 | 51.3 | 52.8 |

## Panel cut out for front/rear mount

Values are taken from the CECC 75301-802




Front mount

| | $b_{\pm 0.13}$ | $e_{\pm 0.2}$ | $f_{\pm 0.2}$ |
|---|---|---|---|
| 9 | 25.0 | 22.2 | 12.3 |
| 15 | 33.3 | 30.5 | 12.3 |
| 25 | 47.0 | 44.3 | 12.3 |
| 37 | 63.5 | 60.7 | 12.3 |
| 50 | 61.1 | 58.3 | 15.1 |

Rear mount

| | $b_{\pm 0.13}$ | $e_{\pm 0.2}$ | $f_{\pm 0.2}$ |
|---|---|---|---|
| 9 | 25.0 | 20.5 | 11.4 |
| 15 | 33.3 | 28.8 | 11.4 |
| 25 | 47.0 | 42.5 | 11.4 |
| 37 | 63.5 | 59.1 | 11.4 |
| 50 | 61.1 | 56.3 | 14.1 |



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Number of contacts

# 9–25

IP67, straight turned solder pins,
with rear plastic mounting plate, spacer and board lock



| Identification | No. of contacts | Part number S4[1)] |
|---|---|---|
| **Male connector**<br>metal shell with dimples | | |
| | 9 | 09 67 509 . 675 |
| | 15 | 09 67 515 . 675 |
| | 25 | 09 67 525 . 675 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ | 7 | |
| M3 ▶ | 9 | |
| **Female connector**<br>metal shell | | |
| | 9 | 09 67 509 . 775 |
| | 15 | 09 67 515 . 775 |
| | 25 | 09 67 525 . 775 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ | 6 | |
| M3 ▶ | 8 | |

[1)] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent



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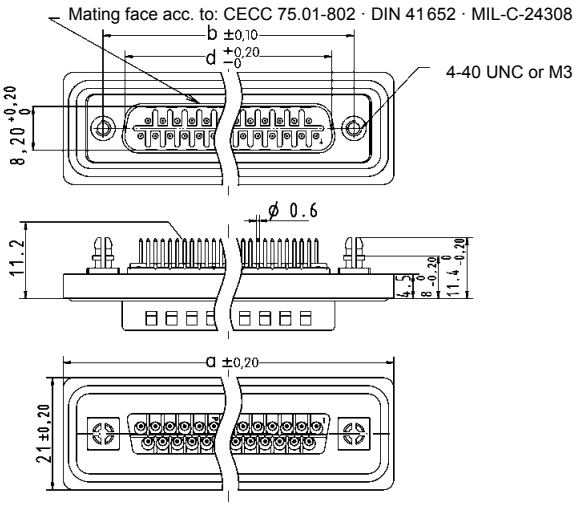
Number of contacts

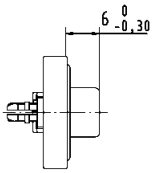
# 9–25

IP67, straight turned solder pins,
with rear plastic mounting plate, spacer and board lock

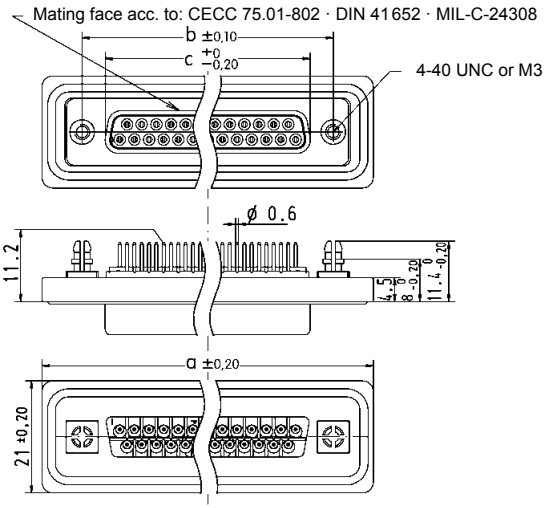
| Identification | Drawing | Dimensions in mm |
|---|---|---|

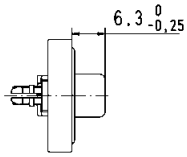
## Male connector
9 – 25 contacts



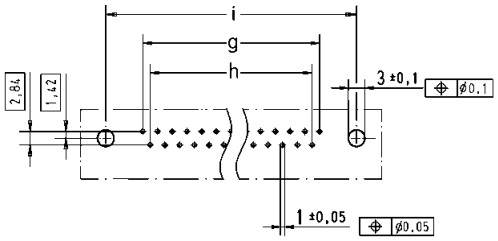

## Female connector
9 – 25 contacts




| | a | b | c | d | g | h | i |
|---|---|---|---|---|---|---|---|
| 9 | 40.0 | 25.00 | 16.4 | 16.9 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 | 25.0 |
| 15 | 48.3 | 33.30 | 24.7 | 25.2 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 | 33.3 |
| 25 | 62.0 | 47.04 | 38.5 | 38.9 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 | 47.0 |

## Board drillings



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Number of contacts

# 9–50

IP67, straight turned solder pins,
with rear metal mounting plate, spacer and board lock



| Identification | No. of contacts | Part number S4[1)] |
|---|---|---|
| **Male connector**<br>metal shell with dimples | | |
| | 9 | 09 67 609 . 675 |
| | 15 | 09 67 615 . 675 |
| | 25 | 09 67 625 . 675 |
| | 37 | 09 67 637 . 675 |
| | 50 | 09 67 650 . 675 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 7 | | |
| M3 ▶ 9 | | |
| **Female connector**<br>metal shell | | |
| | 9 | 09 67 609 . 775 |
| | 15 | 09 67 615 . 775 |
| | 25 | 09 67 625 . 775 |
| | 37 | 09 67 637 . 775 |
| | 50 | 09 67 650 . 775 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 6 | | |
| M3 ▶ 8 | | |

[1)] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent



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Number of contacts

# 9–50

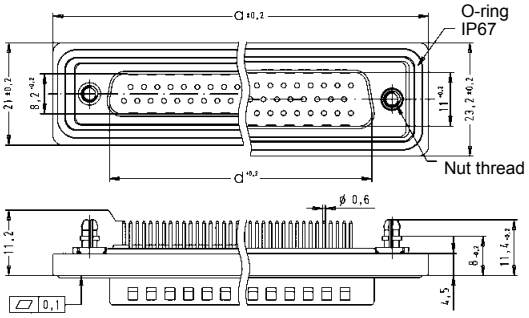
IP67, straight turned solder pins,
with rear metal mounting plate, spacer and board lock

| Identification | Drawing | Dimensions in mm |
|---|---|---|

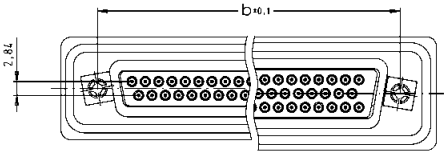
## Male connector

9 – 50 contacts

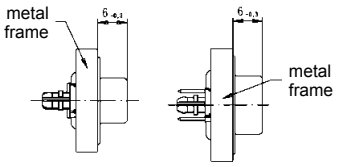
9-37 50





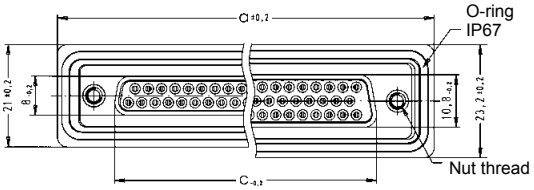



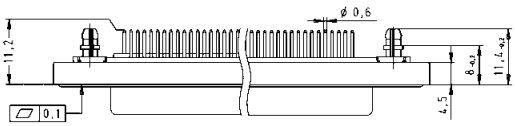
9-37 50

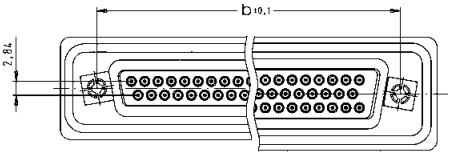


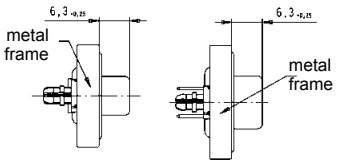

## Female connector

9 – 50 contacts



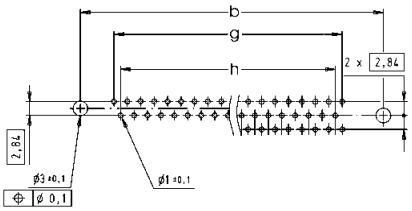








| | a | b | c | d | g | h |
|---|---|---|---|---|---|---|
| 9 | 40.0 | 25.00 | 16.4 | 16.9 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 |
| 15 | 48.3 | 33.30 | 24.7 | 25.2 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 |
| 25 | 62.0 | 47.04 | 38.5 | 38.9 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 |
| 37 | 78.5 | 63.50 | 54.9 | 55.3 | 18 x 2.76 = 49.68 | 17 x 2.76 = 46.92 |
| 50 | 76.1 | 61.10 | 52.5 | 52.8 | 16 x 2.76 = 44.16 | 15 x 2.76 = 41.40 |

## Board drillings



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Number of contacts

# 9–25

IP67, angled turned solder pins,
with rear plastic mounting plate, bracket and board lock



| Identification | No. of contacts | Part number S4[1)] |
|---|---|---|
| **Male connector**<br>metal shell with dimples | | |
| | 9 | 09 67 509 . 658 |
| | 15 | 09 67 515 . 658 |
| | 25 | 09 67 525 . 658 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ | 7 | |
| M3 ▶ | 9 | |
| **Female connector**<br>metal shell | | |
| | 9 | 09 67 509 . 758 |
| | 15 | 09 67 515 . 758 |
| | 25 | 09 67 525 . 758 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ | 6 | |
| M3 ▶ | 8 | |



[1)] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent

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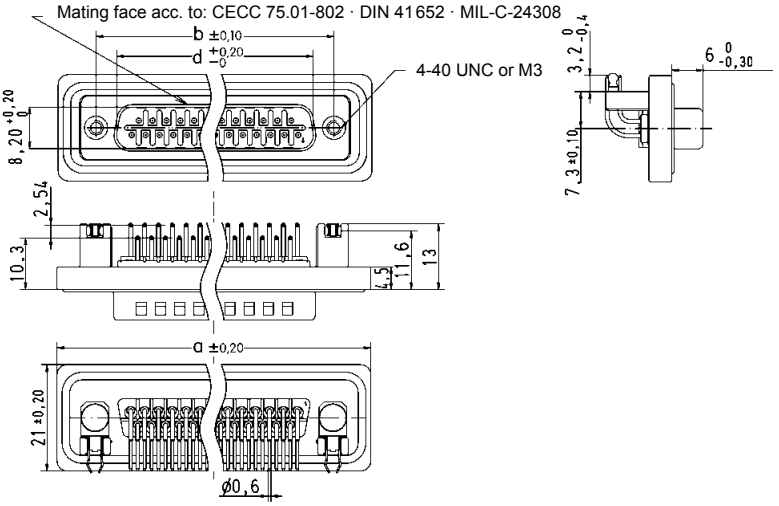
Number of contacts

# 9–25

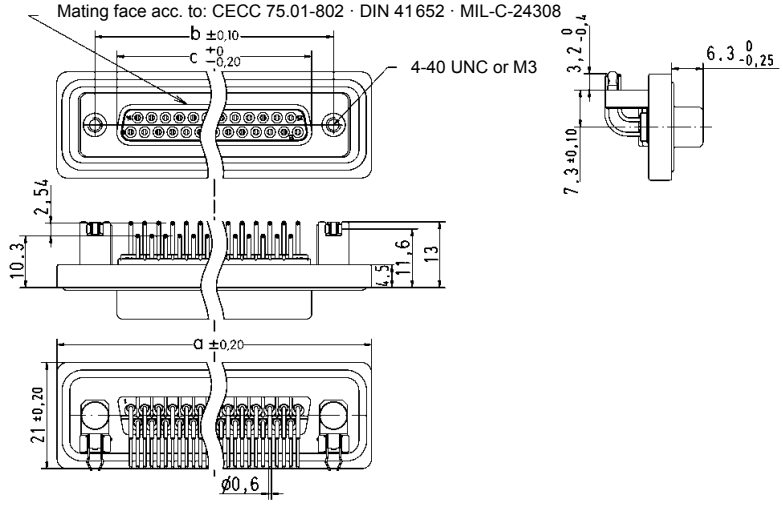
IP67, angled turned solder pins,
with rear plastic mounting plate, bracket and board lock

| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector
9 – 25 contacts

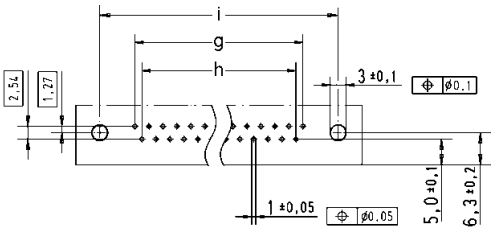



## Female connector
9 – 25 contacts




| | a | b | c | d | g | h | i |
|---|---|---|---|---|---|---|---|
| 9 | 40.0 | 25.00 | 16.4 | 16.9 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 | 25.0 |
| 15 | 48.3 | 33.30 | 24.7 | 25.2 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 | 33.3 |
| 25 | 62.0 | 47.04 | 38.5 | 38.9 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 | 47.0 |

## Board drillings



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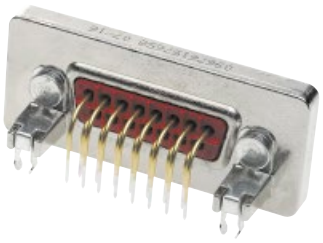
Number of contacts

# 9–50



IP67, angled turned solder pins,
with rear metal mounting plate, bracket and board lock



| Identification | No. of contacts | Part number |
|---|---|---|
| | | S4[1)] |
| **Male connector** | | |
| metal shell with dimples | | |
| | 9 | 09 67 609 . 658 |
| | 15 | 09 67 615 . 658 |
| | 25 | 09 67 625 . 658 |
| | 37 | 09 67 637 . 658 |
| | 50 | 09 67 650 . 658 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 7 | | |
| M3 ▶ 9 | | |
| **Female connector** | | |
| metal shell | | |
| | 9 | 09 67 609 . 758 |
| | 15 | 09 67 615 . 758 |
| | 25 | 09 67 625 . 758 |
| | 37 | 09 67 637 . 758 |
| | 50 | 09 67 650 . 758 |
| Please insert digit for flange thread | | |
| 4-40 UNC ▶ 6 | | |
| M3 ▶ 8 | | |

[1)] S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent



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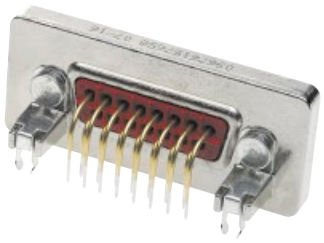
Number of contacts

# 9–50

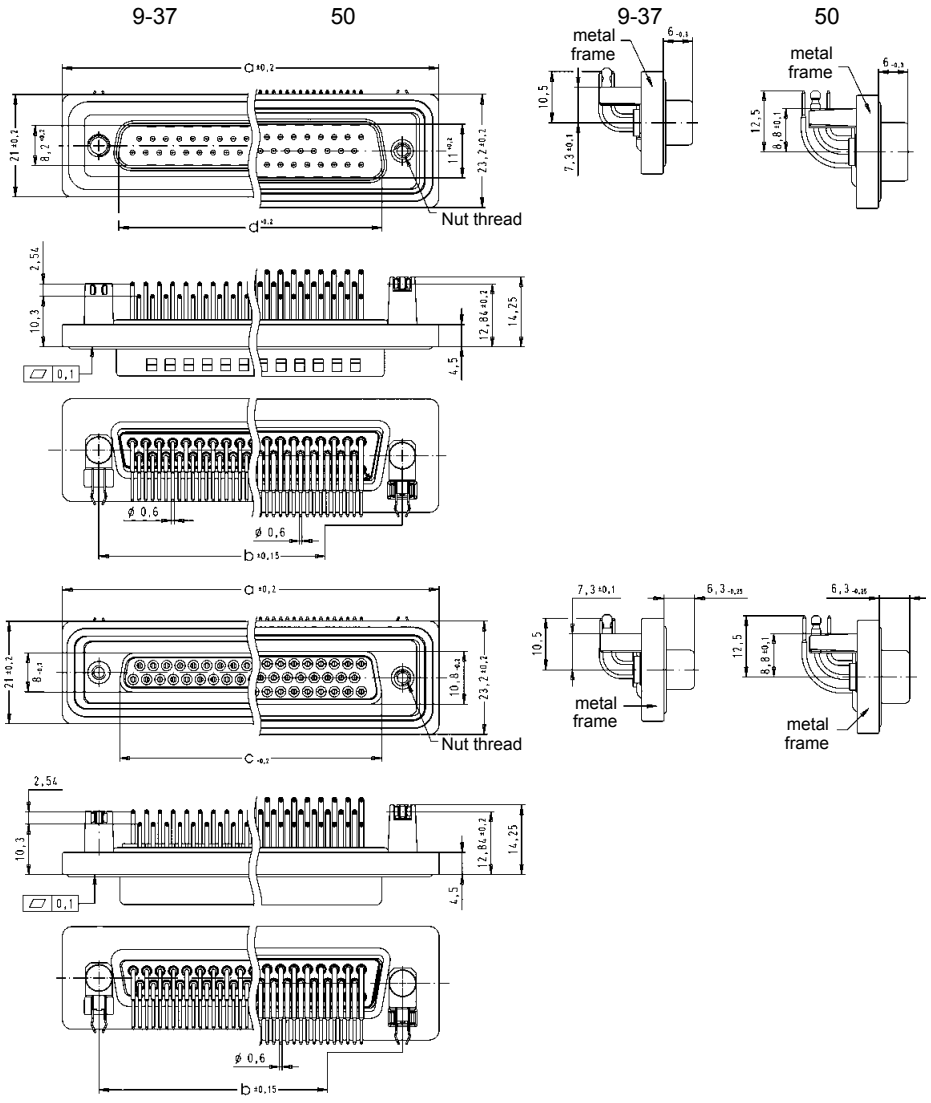


IP67, angled turned solder pins,
with rear metal mounting plate, bracket and board lock

| Identification | Drawing | Dimensions in mm |
|---|---|---|

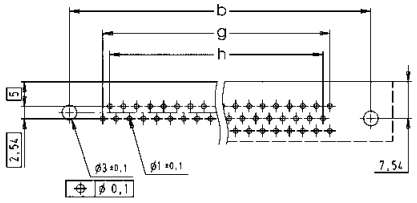
## Male connector
9 – 50 contacts

## Female connector
9 – 50 contacts




| | a | b | c | d | g | h |
|---|---|---|---|---|---|---|
| 9 | 40.0 | 25.00 | 16.4 | 16.9 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 |
| 15 | 48.3 | 33.30 | 24.7 | 25.2 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 |
| 25 | 62.0 | 47.04 | 38.5 | 38.9 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 |
| 37 | 78.5 | 63.50 | 54.9 | 55.3 | 18 x 2.76 = 49.68 | 17 x 2.76 = 46.92 |
| 50 | 76.1 | 61.10 | 52.5 | 52.8 | 16 x 2.76 = 44.16 | 15 x 2.76 = 41.40 |

## Board drillings



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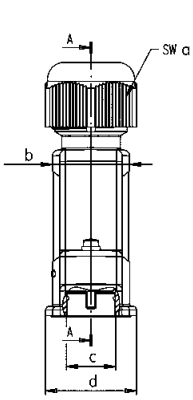
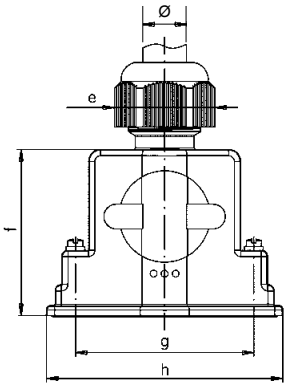
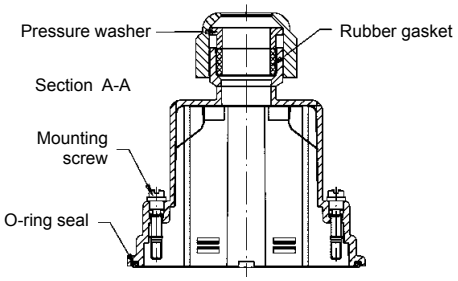
# IP67 plastic hoods
# IP67 metallized plastic hoods
# for rear mount

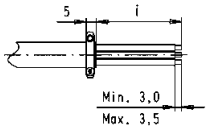
| Identification | No. of contacts | Part number |
|---|---|---|
| **Hood**[1] | | |
| Black thermoplastic | | |
| | 9 | 09 67 009 043 . |
| | 15 | 09 67 015 043 . |
| | 25 | 09 67 025 043 . |
| | 37 | 09 67 037 043 . |
| | 50 | 09 67 050 043 . |
| Metallized thermo-plastic | | |
| | 9 | 09 67 009 053 . |
| | 15 | 09 67 015 053 . |
| | 25 | 09 67 025 053 . |
| | 37 | 09 67 037 053 . |
| | 50 | 09 67 050 053 . |
| Please insert digit for screw option | | |
| Locking screw, thread 4-40 UNC ▶ 8 | | |
| Locking screw, thread M3 ▶ 9 | | |

Drawing

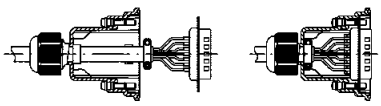



Stripping dimensions



Mounting instructions:

– The peeled back cable braiding must not extend over the cable clamp, in order not to damage the gasket or to impair its performance.
– Pull back cable until cable clamp snaps into shielding plate.
– Snap connector into hood.

| | a | b | c | d | e | f | g | h | i | Ø min. | Ø max. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9 | 20 | 16.5 | 13.0 | 20.2 | 22.1 | 36.4 | 25.0 | 39.8 | 18.0 | 6.0 | 8.0 |
| 15 | 24 | 16.5 | 13.0 | 20.2 | 26.6 | 36.4 | 33.3 | 48.5 | 18.0 | 6.0 | 10.5 |
| 25 | 24 | 20.3 | 13.0 | 24.0 | 26.6 | 43.6 | 47.0 | 62.3 | 45.0 | 8.0 | 12.0 |
| 37 | 24 | 20.3 | 13.0 | 24.0 | 26.6 | 52.1 | 63.5 | 78.6 | 60.0 | 8.0 | 12.0 |
| 50 | 29 | 22.0 | 16.0 | 27.6 | 32.1 | 52.1 | 61.1 | 75.7 | 60.0 | 9.0 | 14.0 |

[1] Not to be used with 9 to 50-pole crimp connectors



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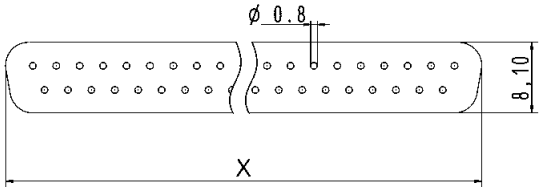
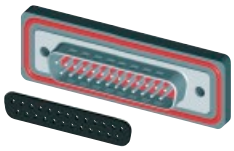
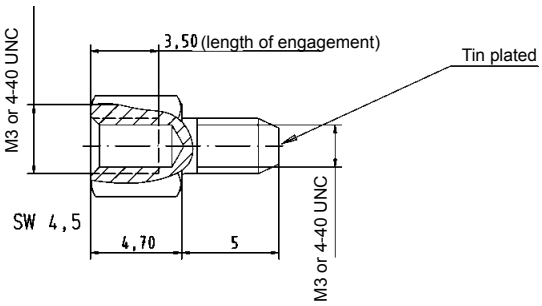
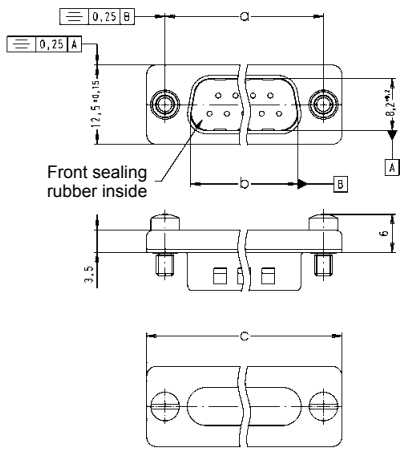
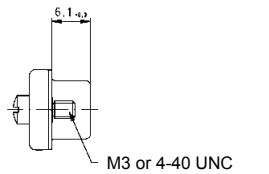
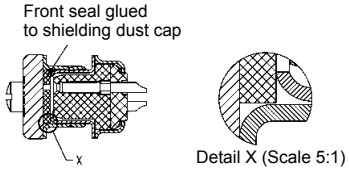
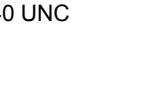
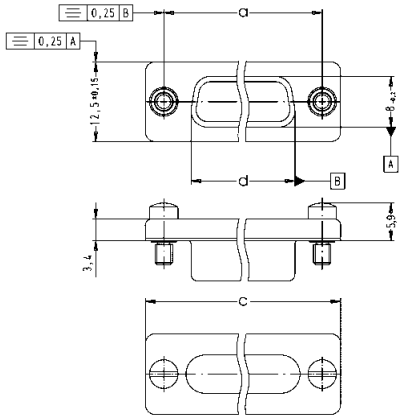
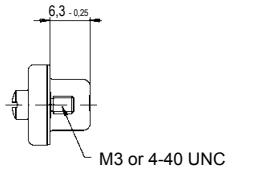
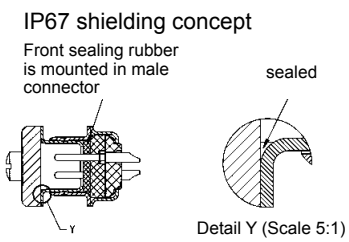
## Accessories for IP67 connectors

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Front sealing rubber**[1] IP67 | 9 | 09 67 002 9001 |   | x: 9 = 16.7; 15 = 24.8; 25 = 38.8 |
| | 15 | 09 67 002 9002 | | |
| | 25 | 09 67 002 9003 | | |
| Mounting example  | | | | |
| **Female screw lock and spacing washer**[2] M3 | | 09 67 002 9006 |   | |
| 4-40 UNC | | 09 67 002 9007 | | |
| [2] Order 2 for each connector | | | | |
| **Dust cap** for female connectors[3] M3 | 9 | 09 67 002 9055 |     IP67 shielding concept   | a: 9 = 25.00; 15 = 33.30; 25 = 47.04 — b: 16.9; 25.2; 38.9 — c: 30.8; 39.1; 53.0 — d: 16.4; 24.7; 38.5 |
| | 15 | 09 67 002 9056 | | |
| | 25 | 09 67 002 9057 | | |
| 4-40 UNC  | 9 | 09 67 002 9050 | | |
| | 15 | 09 67 002 9051 | | |
| | 25 | 09 67 002 9052 | | |
| [3] With inside glued front sealing rubber | | | | |
| for male connectors[4] M3 | 9 | 09 67 002 9065 |     IP67 shielding concept   | |
| | 15 | 09 67 002 9066 | | |
| | 25 | 09 67 002 9067 | | |
| 4-40 UNC | 9 | 09 67 002 9060 | | |
| | 15 | 09 67 002 9061 | | |
| | 25 | 09 67 002 9062 | | |
| [4] Order separately the front sealing rubber for an IP67 performance | | | | |

[1] The front sealing rubber is to be used with hood 09 67 0xx 0436 and 09 67 0xx 0437 when a mated system needs to have the IP67 performance; in this case, the front sealing rubber is positioned in the IP67 male connector prior to the mating operation with the facing IP67 connector; it provides a full protection of the contacts at the mated area by preventing possible ingress of liquids or dust between the shells.



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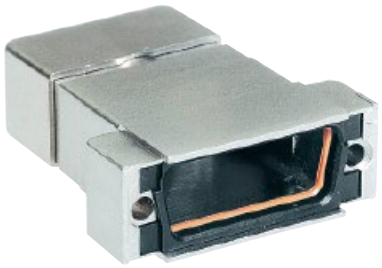
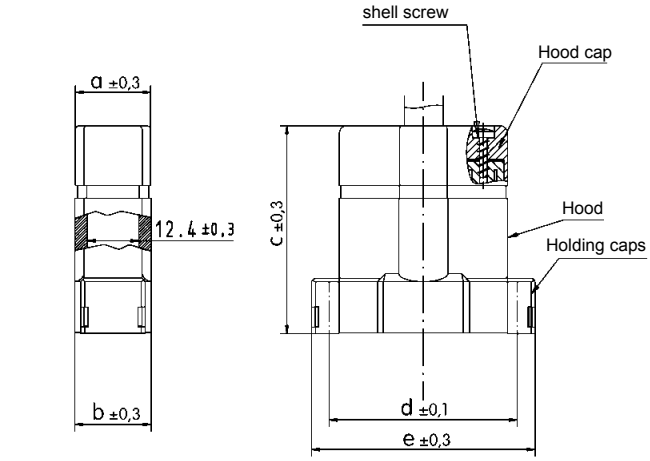
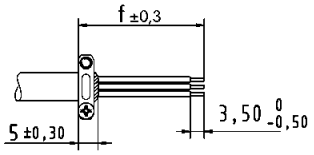


## IP67 plastic hoods
## IP67 metallized plastic hoods

| Identification | No. of contacts | Part number |
|---|---|---|
| **Hood** | | |
| Black thermoplastic | | |
| | 9 | 09 67 009 0436 |
| | 15 | 09 67 015 0436 |
| | 25 | 09 67 025 0436 |
| Metallized thermoplastic | | |
| | 9 | 09 67 009 0437 |
| | 15 | 09 67 015 0437 |
| | 25 | 09 67 025 0437 |

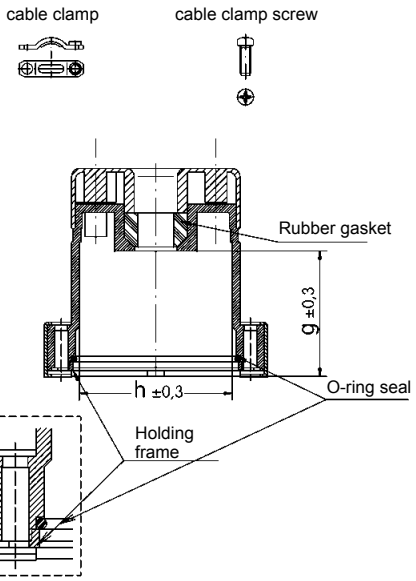
Dimensions in mm




Mounting instructions

The stripped braid should not be fold back to avoid damaging the cable clamp and reducing its performance.




| | a | b | c | d | e | f | g | h |
|---|---|---|---|---|---|---|---|---|
| 9 | 15.6 | 15.6 | 41.0 | 25.00 | 33.6 | 23.0 | 25.0 | 17.0 |
| 15 | 15.6 | 15.6 | 46.8 | 33.30 | 42.0 | 27.5 | 30.8 | 25.1 |
| 25 | 18.8 | 19.1 | 52.0 | 47.04 | 55.7 | 31.5 | 33.8 | 38.8 |



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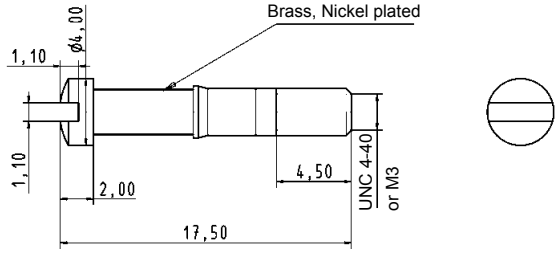
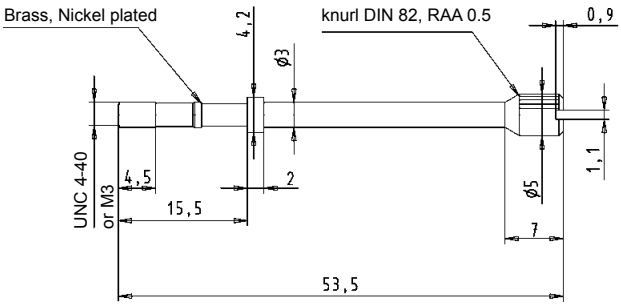
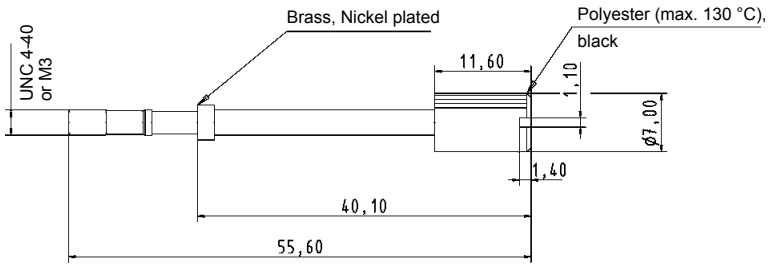
## Accessories for IP67 hoods

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Short locking screw<br>4-40 UNC | 09 67 002 9008 |  | |
| Short locking screw<br>M3 | 09 67 002 9009 | | |
| Knurled<br>locking screw<br>4-40 UNC | 09 67 002 9010 |  | |
| Knurled<br>locking screw<br>M3 | 09 67 002 9011 | | |
| Knurled<br>locking screw<br>4-40 UNC<br>with plastic cap | 09 67 002 9012 |  | |
| Knurled<br>locking screw<br>M3<br>with plastic cap | 09 67 002 9013 | | |



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# HARTING – Guarantee a secure connection

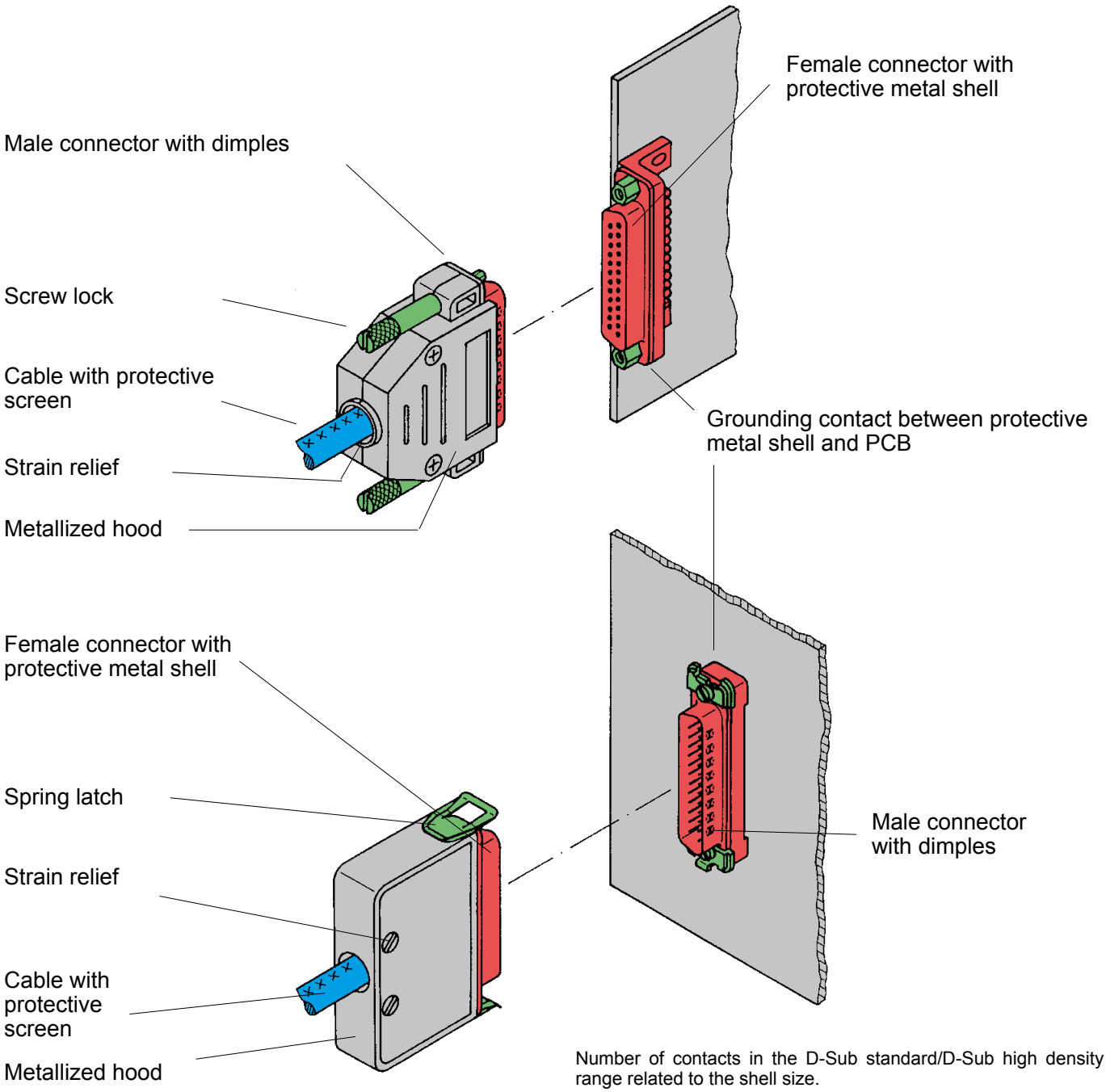
Modern electronic applications demand a high degree of mechanical and electrical security.

To meet these requirements, continuous screening from the cable to the PCB via the connector is achieved by using state of the art components to DIN 41652.

HARTING offer many solutions. These utilise various combinations of male and female connectors with hoods, featuring either screw locking or latching facilities.

Only 2 examples are shown:

- Continuous security screening and grounding with screw locking and metallized hood.
- Continuous grounding and vibration proof latching system with metallized hood.




Number of contacts in the D-Sub standard/D-Sub high density range related to the shell size.

| Shell size | D-Sub standard | D-Sub high density |
|---|---|---|
| 1 | 9 | 15 |
| 2 | 15 | 26 |
| 3 | 25 | 44 |
| 4 | 37 | 62 |
| 5 | 50 | 78 |



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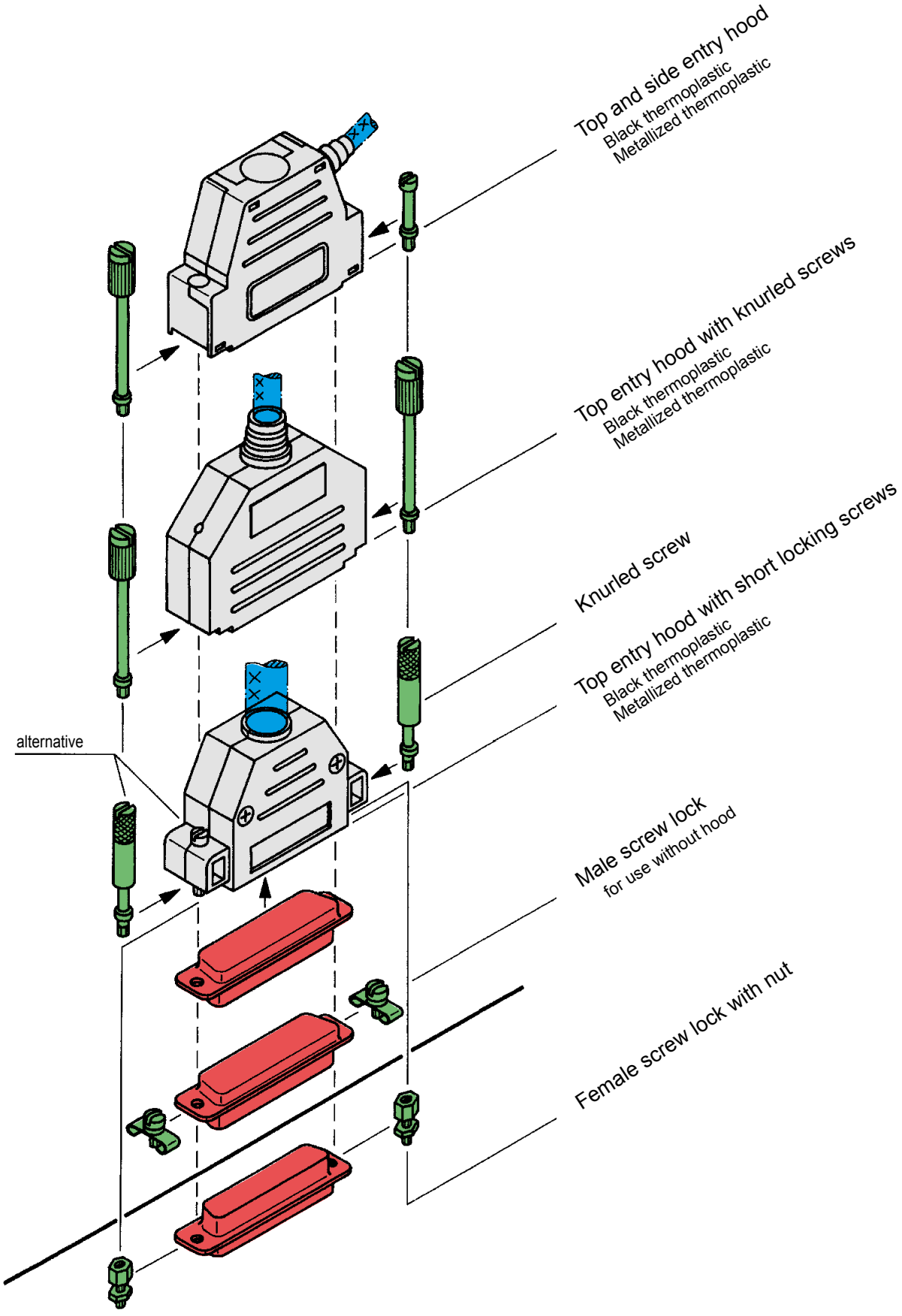
## Connector hoods for screw locking





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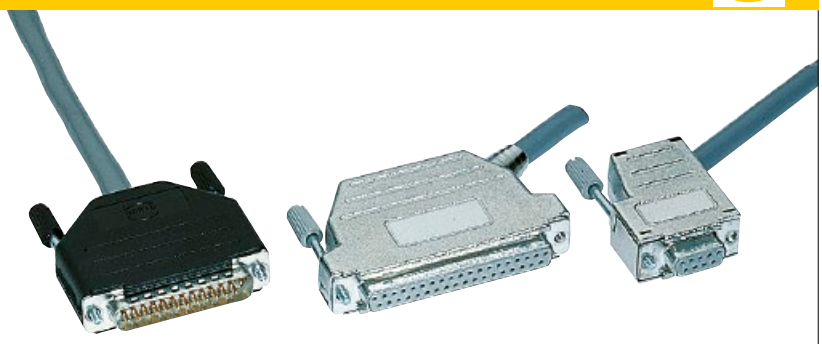
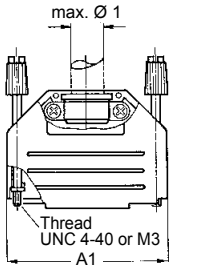
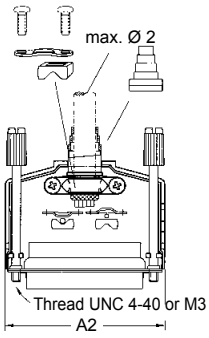
# D-Sub



## Top and side entry hoods with knurled screws

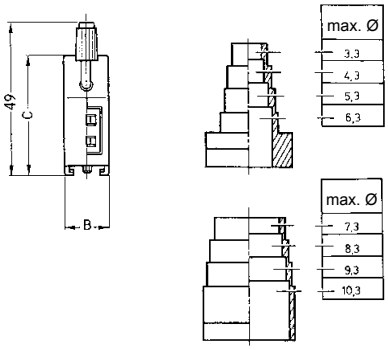
| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Top entry hood**<br>Black thermoplastic | | | | |
| | 9 | 09 67 009 042 . | | |
| | 15 | 09 67 015 042 . | | |
| Please insert digit for screw option | 25 | 09 67 025 042 . | | |
| | 37 | 09 67 037 042 . | | |
| | 50 | 09 67 050 042 . | | |
| Knurled screw, thread 4-40 UNC ▶ 4 | | | | |
| Knurled screw, thread M3 ▶ 6 | | | | |
| **Top entry hood**<br>Metallized thermoplastic | | | | |
| | 9 | 09 67 009 042 . | | |
| | 15 | 09 67 015 042 . | | |
| | 25 | 09 67 025 042 . | | |
| | 37 | 09 67 037 042 . | | |
| Please insert digit for screw option | | | | |
| Knurled screw, thread 4-40 UNC ▶ 5 | | | | |
| Knurled screw, thread M3 ▶ 7 | | | | |
| **Top and side entry hood**<br>Black thermoplastic | | | | |
| | 9[3] | 09 67 009 043 . | | |
| | 15 | 09 67 015 043 . | | |
| | 25 | 09 67 025 043 . | | |
| | 37[1] | 09 67 037 043 . | | |
| Please insert digit for screw option | | | | |
| Knurled screw, thread 4-40 UNC ▶ 4 | | | | |
| Knurled screw, thread M3 ▶ 0 | | | | |
| **Top and side entry hood**<br>Metallized thermoplastic | | | | |
| | 9[3] | 09 67 009 043 . | | |
| | 15 | 09 67 015 043 . | | |
| | 25[2] | 09 67 025 043 . | | |
| | 37[1] | 09 67 037 043 . | | |
| Please insert digit for screw option | | | | |
| Knurled screw, thread 4-40 UNC ▶ 5 | | | | |
| Knurled screw, thread M3 ▶ 1 | | | | |



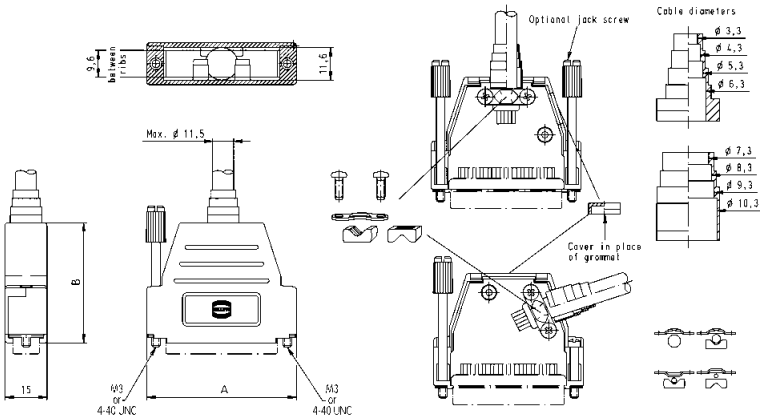




| | A1 | A2 | B | C1 | C2 | max. Ø 1 | max. Ø 2 |
|---|---|---|---|---|---|---|---|
| 9 | 31.5 | 32.5 | 15 | 34 | 38 | 8.0 | 11.5 |
| 15 | 40.0 | 41.0 | 15 | 34 | 38 | 11.5 | 11.5 |
| 25 | 53.5 | 54.5 | 15 | 40 | 40 | 11.5 | 11.5 |
| 37 | 71.0 | 71.0 | 15 | 40 | 40 | 11.5 | 11.5 |
| 50 | 67.5 | | 19 | 40 | | 14.0 | |

C1: non-metallized C2: metallized




Cut appropriate cable entry to fit actual cable diameter




| | A | B |
|---|---|---|
| 9 | 31.5 | 40 |
| 15 | 40.0 | 40 |
| 25 | 53.5 | 43 |
| 37 | 71.3 | 40 |

[1] 37-pole is only available with side entry and with knurled screw, thread 4-40 UNC

[2] Cable clamp kit for two outputs is available as accessories (it includes: screw, metal clamp, plastic insert and grommet). With Part number 09 67 001 9988 ten of these kits are delivered.

[3] 9-pole hood provided with only one screw on the opposite side of the cable entry.

Operating temperature for all hoods on this page: -55 °C … +110 °C



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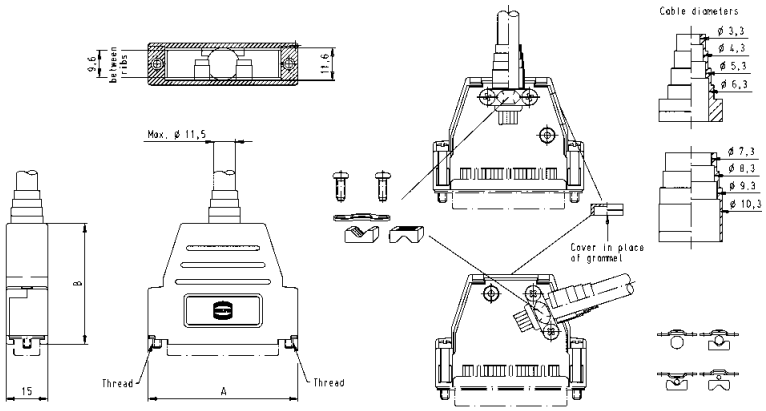
## Top and side entry hoods with short screws

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Top and side entry hood**<br>Black thermoplastic | 9[1)] | 09 67 009 046 . | | |
| | 15 | 09 67 015 046 . | | |
| | 25 | 09 67 025 046 . | | |
| | 37 | 09 67 037 046 . | | |
| Please insert digit for screw option | | | | |
| Short screw, thread 4-40 UNC ▶ 3 | | | | |
| Short screw, ▶ 2 thread M3 | | | | |
| **Top and side entry hood**<br>Metallized thermoplastic | 9[1)] | 09 67 009 046 . | | |
| | 15 | 09 67 015 046 . | | |
| | 25 | 09 67 025 046 . | | |
| | 37 | 09 67 037 046 . | | |
| Please insert digit for screw option | | | | |
| Short screw, thread 4-40 UNC ▶ 5 | | | | |
| Short screw, ▶ 4 thread M3 | | | | |




| | A | B |
|---|---|---|
| 9 | 31.5 | 40 |
| 15 | 40.0 | 40 |
| 25 | 53.5 | 43 |
| 37 | 71.3 | 40 |

[1)] 9-pole hood provided with only one screw on the opposite side of the cable entry.
Operating temperature for all hoods on this page: -55 °C … +110 °C



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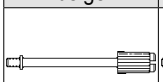
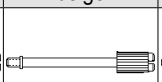
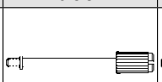
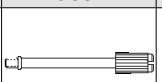
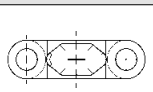
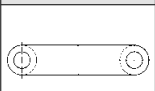
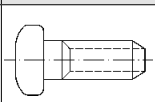
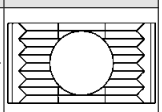
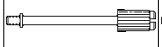
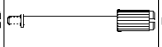
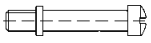
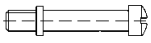
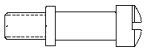
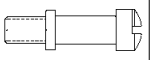
| | Knurled screw M3, beige | Knurled screw 4-40 UNC, beige | Knurled screw M3, black | Knurled screw 4-40 UNC, black | Cable clamp, small | Cable clamp, large | Cable clamp screw | Metallized insert, small |
|---|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |  |  |
| Part number | 09 67 002 9152 | 09 67 002 9081 | 09 67 001 9961 | 09 67 002 9024 | 09 67 002 9104 | 09 67 002 9106 | 09 67 002 9102 | 09 67 002 9103 |
| 09 67 009 0424 | | | | 2 | 1 | | 2 | |
| 09 67 015 0424 | | | | 2 | | 1 | 2 | |
| 09 67 025 0424 | | | | 2 | | 1 | 2 | |
| 09 67 037 0424 | | | | 2 | | 1 | 2 | |
| 09 67 050 0424 | | | | 2 | | 1 | 2 | |
| 09 67 009 0426 | | | 2 | | 1 | | 2 | |
| 09 67 015 0426 | | | 2 | | | 1 | 2 | |
| 09 67 025 0426 | | | 2 | | | 1 | 2 | |
| 09 67 037 0426 | | | 2 | | | 1 | 2 | |
| 09 67 050 0426 | | | 2 | | | 1 | 2 | |
| 09 67 009 0425 | | 2 | | | 1 | | 2 | 1 |
| 09 67 015 0425 | | 2 | | | | 1 | 2 | |
| 09 67 025 0425 | | 2 | | | | 1 | 2 | |
| 09 67 037 0425 | | 2 | | | | 1 | 2 | |
| 09 67 009 0427 | 2 | | | | 1 | | 2 | 1 |
| 09 67 015 0427 | 2 | | | | | 1 | 2 | |
| 09 67 025 0427 | 2 | | | | | 1 | 2 | |
| 09 67 037 0427 | 2 | | | | | 1 | 2 | |

| | Knurled screw M3, beige | Knurled screw 4-40 UNC, beige | Knurled screw M3, black | Knurled screw 4-40 UNC, black | Short screw M3, 18 mm | Short screw 4-40 UNC, 18 mm | Short screw M3, 12 mm | Short screw 4-40 UNC, 12 mm |
|---|---|---|---|---|---|---|---|---|
| |  | |  | |  |  |  |  |
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| 09 67 025 0434 | | | | 1 | | 1 | | |
| 09 67 037 0434 | | | | | | | | 1 |
| 09 67 009 0430 | | | 1 | | | | | |
| 09 67 015 0430 | | | 1 | | | | 1 | |
| 09 67 025 0430 | | | 1 | | 1 | | | |
| 09 67 009 0435 | | 1 | | | | | | |
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| 09 67 025 0435 | | 1 | | | | 1 | | |
| 09 67 037 0435 | | | | | | | | 1 |
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| 09 67 015 0431 | 1 | | | | | | 1 | |
| 09 67 025 0431 | 1 | | | | 1 | | | |
| 09 67 009 0463 | | | | | | 1 | | |
| 09 67 015 0463 | | | | | | | | 2 |
| 09 67 025 0463 | | | | | | 2 | | |
| 09 67 037 0463 | | | | | | | | 2 |
| 09 67 009 0462 | | | | | 1 | | | |
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| 09 67 025 0462 | | | | | 2 | | | |
| 09 67 037 0462 | | | | | | | 2 | |
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| 09 67 015 0465 | | | | | | | | 2 |
| 09 67 025 0465 | | | | | | 2 | | |
| 09 67 037 0465 | | | | | | | | 2 |
| 09 67 009 0464 | | | | | 1 | | | |
| 09 67 015 0464 | | | | | | | 2 | |
| 09 67 025 0464 | | | | | 2 | | | |
| 09 67 037 0464 | | | | | | | 2 | |



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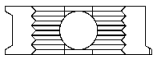
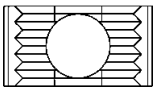
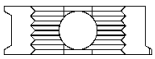
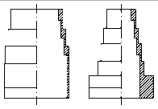
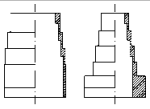
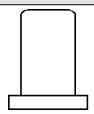
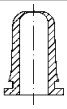
# Scope of delivery and spare parts

| | Metallized insert, large | Small plastic insert, black | Large plastic insert, black | Grommet kit, metallized | Grommet kit, black (optional) | Rubber grommet, small (optional) | Rubber grommet, large (optional) |
|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |  |
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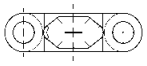
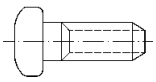
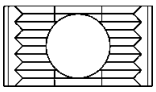
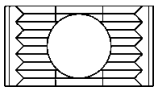
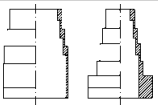
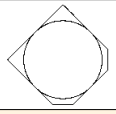
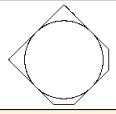
| 09 67 015 0424 | | | 1 | | 1 | | 1 |
| 09 67 025 0424 | | | 1 | | 1 | | 1 |
| 09 67 037 0424 | | | 1 | | 1 | | 1 |
| 09 67 050 0424 | | | 1 | | 1 | | no |
| 09 67 009 0426 | | 1 | | | 1 | 1 | |
| 09 67 015 0426 | | | 1 | | 1 | | 1 |
| 09 67 025 0426 | | | 1 | | 1 | | 1 |
| 09 67 037 0426 | | | 1 | | 1 | | 1 |
| 09 67 050 0426 | | | 1 | | 1 | | no |
| 09 67 009 0425 | | | | | | | |
| 09 67 015 0425 | 1 | | | 1 | | | |
| 09 67 025 0425 | 1 | | | 1 | | | |
| 09 67 037 0425 | 1 | | | 1 | | | |
| 09 67 009 0427 | | | | | | | |
| 09 67 015 0427 | 1 | | | 1 | | | |
| 09 67 025 0427 | 1 | | | 1 | | | |
| 09 67 037 0427 | 1 | | | 1 | | | |

| | Cable clamp, small | Cable clamp screw | Metallized insert, small | Small plastic insert, black | Grommet kit, metallized | Plastic plug, metallized | Plastic plug, black |
|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |  |
| Part number | 09 67 002 9104 | 09 67 002 9102 | 09 67 002 9103 | 09 67 002 9150 | 09 67 002 9075 | 09 67 001 9980 | 09 67 002 9161 |
| 09 67 009 0434 | 1 | 2 | | 1 | | | 1 |
| 09 67 015 0434 | 1 | 2 | | 1 | | | 1 |
| 09 67 025 0434 | 1 | 2 | | 1 | | | 1 |
| 09 67 037 0434 | 1 | 2 | | 1 | | | |
| 09 67 009 0430 | 1 | 2 | | 1 | | | 1 |
| 09 67 015 0430 | 1 | 2 | | 1 | | | 1 |
| 09 67 025 0430 | 1 | 2 | | 1 | | | 1 |
| 09 67 009 0435 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 015 0435 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 025 0435 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 037 0435 | 1 | 2 | 1 | | 1 | N/A | |
| 09 67 009 0431 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 015 0431 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 025 0431 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 009 0463 | 1 | 2 | | 1 | | | 1 |
| 09 67 015 0463 | 1 | 2 | | 1 | | | 1 |
| 09 67 025 0463 | 1 | 2 | | 1 | | | 1 |
| 09 67 037 0463 | 1 | 2 | | 1 | | | N/A |
| 09 67 009 0462 | 1 | 2 | | 1 | | | 1 |
| 09 67 015 0462 | 1 | 2 | | 1 | | | 1 |
| 09 67 025 0462 | 1 | 2 | | 1 | | | 1 |
| 09 67 037 0462 | 1 | 2 | | 1 | | | N/A |
| 09 67 009 0465 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 015 0465 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 025 0465 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 037 0465 | 1 | 2 | 1 | | 1 | N/A | |
| 09 67 009 0464 | 1 | 2 | 1 | | 1 | 1 | |
| 09 67 015 0464 | 1 | 2 | 1 | | 1 | 1 | |
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| 09 67 037 0464 | 1 | 2 | 1 | | 1 | N/A | |





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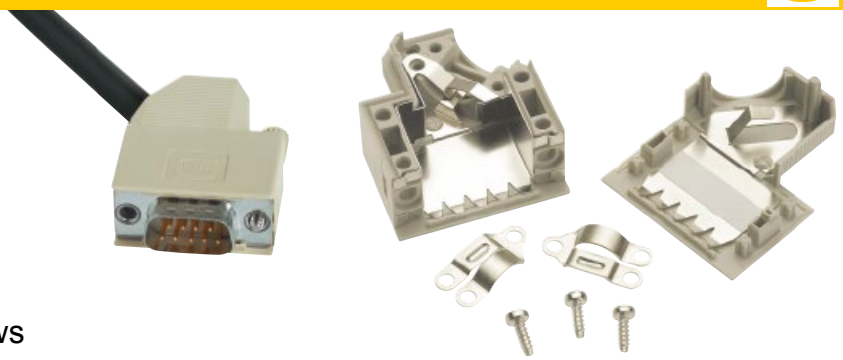
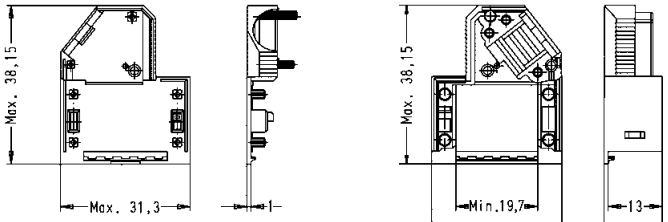


## Side entry hoods with knurled screws

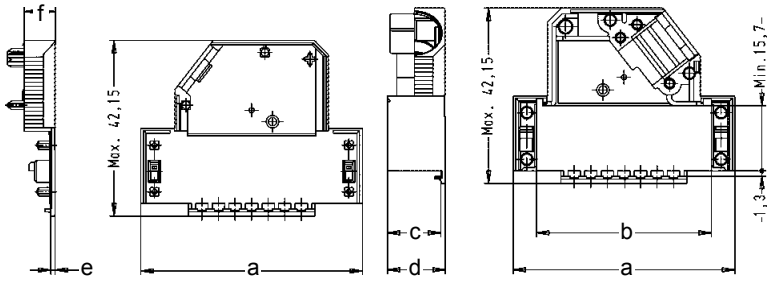
| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Hood**[1] | | | | |
| grey thermoplastic RAL 7032 | 9 | 09 67 009 0571 | | |
| | 15 | 09 67 015 0571 | | |
| | 25 | 09 67 025 0571 | | |
| | 37 | 09 67 037 0571 | | |
| | 50 | 09 67 050 0571 | | |
| grey thermoplastic with internal tin-plate screening | 9 | 09 67 009 0573 | | |
| | 15 | 09 67 015 0573 | | |
| | 25 | 09 67 025 0573 | | |
| | 37 | 09 67 037 0573 | | |
| | 50 | 09 67 050 0573 | | |
| 9-37 way for packaging density of 3 TE (15.24 mm) | | | | |
| **Knurled screw** | | | | |
| Thread UNC<br>Thread M3 | 9-50 | 09 67 000 9971[2]<br>09 67 001 9965* | | |
| Thread UNC<br>Thread M3 | 9-50 | 09 67 001 9978<br>09 67 001 9977 | | |
| **Tooling** for assembly of hoods | | | | |
| Top part | | 09 99 000 0215* | | |
| Bottom part | | 09 99 000 0216* | | |

Upper hood part / Lower hood part

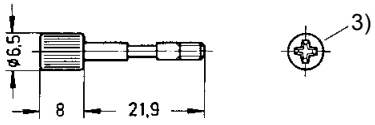
9 contacts



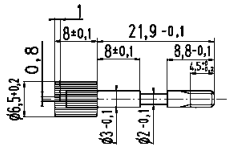

15 – 50 contacts




| | a max. | b min. | c | d | e | f |
|---|---|---|---|---|---|---|
| 15 | 39.62 | 28.40 | 13.00 | 14.00 | 1.00 | 7.50 |
| 25 | 53.52 | 42.20 | 13.00 | 14.00 | 1.00 | 7.50 |
| 37 | 69.80 | 58.65 | 13.00 | 14.00 | 1.00 | 7.50 |
| 50 | 67.41 | 56.18 | 16.00 | 17.50 | 1.50 | 9.50 |




Grey head / Nickel plated steel




Full metal part

* Not normally kept in stock
[1] Order knurled screw separately
[2] 9 way 1 per hood – 15-50 way 2 per hood
[3] Screw driver type ISO PH 1 for philips screw No 1 ISO norm 4757
Operating temperature for all hoods on this page: -30 °C … +100 °C



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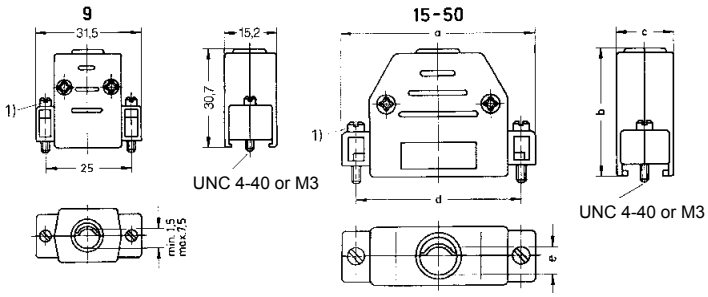
# D-Sub

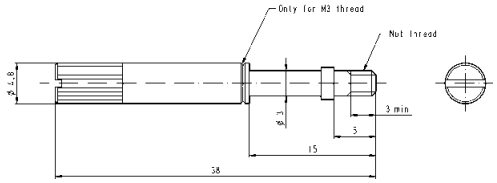
## Top entry hoods with knurled or locking screws

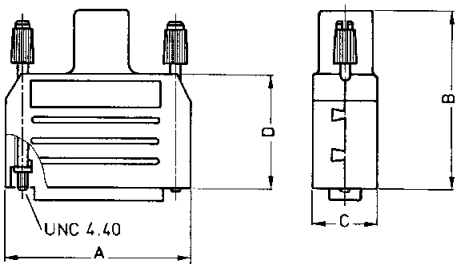
| Identification | No. of contacts | Part number |
|---|---|---|
| **Hood**[3] | | |
| Black thermoplastic with short locking screws | 9 | 09 67 009 0442 |
| | 15 | 09 67 015 0442 |
| | 25 | 09 67 025 0442 |
| | 37 | 09 67 037 0442 |
| | 50 | 09 67 050 0442 |
| **Hood**[3] | | |
| Metallized thermo-plastic with short locking screws | 9 | 09 67 009 04 . 3 |
| | 15 | 09 67 015 04 . 3 |
| | 25 | 09 67 025 04 . 3 |
| | 37 | 09 67 037 04 . 3 |
| | 50 | 09 67 050 04 . 3 |
| Please insert digit for screw option | | |
| Thread 4-40 UNC ▶ 4 | | |
| Thread M3 ▶ 2 | | |
| **Knurled screw** | | |
| for metallized hood | | |
| Thread UNC | 9-50 | 09 67 000 9925[2] |
| Thread M3 | 9-50 | 09 67 000 9930[2] |
| **Screened hood** | | |
| Order cover and internal metal screen separately | | |
| **Cover**[4] | | |
| Black thermoplastic with knurled screws | 9 | 09 67 009 0422 |
| | 15 | 09 67 015 0422 |
| | 25 | 09 67 025 0422 |
| | 37 | 09 67 037 0422 |
| **Internal metal screen**[4] | | |
| metallized | 9 | 09 67 009 0421 |
| | 15 | 09 67 015 0421 |
| (Crimp tool | 25 | 09 67 025 0421 |
| see chapter 20) | 37 | 09 67 037 0421 |

Dimensions in mm

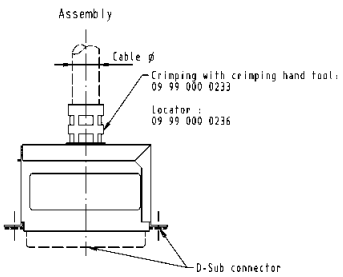



| | a | b | c | d | e min. | e max. |
|---|---|---|---|---|---|---|
| 15 | 40.0 | 34.7 | 15.2 | 33.3 | 3.3 | 8.5 |
| 25 | 53.2 | 39.7 | 15.2 | 47.0 | 3.5 | 11.0 |
| 37 | 70.0 | 39.7 | 15.2 | 63.5 | 3.5 | 11.0 |
| 50 | 67.5 | 39.7 | 18.2 | 61.1 | 9.3 | 12.0 |




| | A | B | C | D |
|---|---|---|---|---|
| 9 | 35.0 | 54 | 19.1 | 34 |
| 15 | 43.0 | 54 | 19.1 | 34 |
| 25 | 57.5 | 54 | 19.1 | 34 |
| 37 | 74.0 | 54 | 19.1 | 34 |




| | Cable Ø (mm) min. | Cable Ø (mm) max. |
|---|---|---|
| 9 | 6.1 | 8.8 |
| 15 | 6.1 | 8.8 |
| 25 | 8.0 | 10.3 |
| 37 | 9.5 | 11.5 |

1) Use of knurled screws is possible. Please order separately
2) Order 2 for each hood
3) Operating temperature: -20 °C … +90 °C
4) Operating temperature: -55 °C … +110 °C



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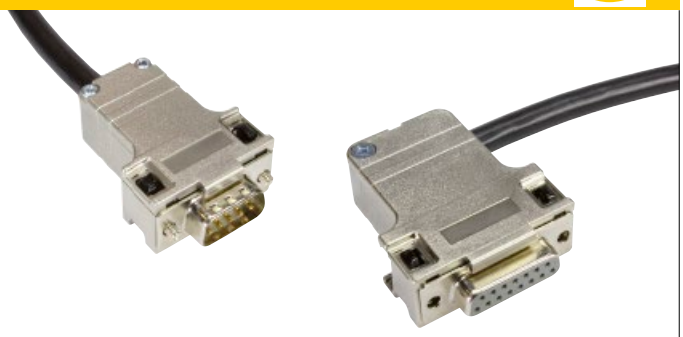
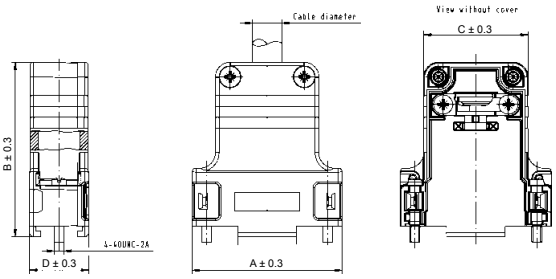
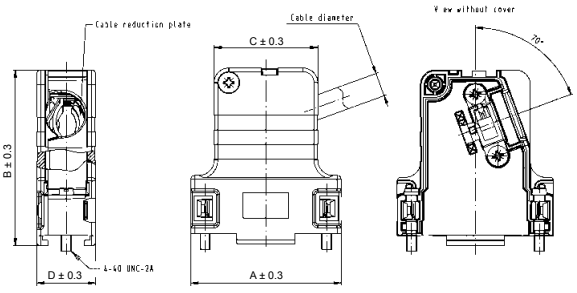


## Metallized thermoplastic top and side entry hoods with short screws

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Top entry hood**<br>Short screw, thread 4-40 UNC | 9 | 09 67 009 0446 |  | |
| | 15 | 09 67 015 0446 | | |
| | 25 | 09 67 025 0446 | | |
| | 37 | 09 67 037 0446 | | |
| | 50 | 09 67 050 0446 | | |
| **Side entry hood**<br>Short screw, thread 4-40 UNC | 9 | 09 67 009 0448 |  | |
| | 15 | 09 67 015 0448 | | |
| | 25 | 09 67 025 0448 | | |
| | 37 | 09 67 037 0448 | | |
| | 50 | 09 67 050 0448 | | |

| Poles | A | B | C | D | Cable diameter | |
|---|---|---|---|---|---|---|
| | | | | | Min. | Max. |
| 9 | 31.8 | 41.6 | 20.0 | 16.7 | 4.0 | 11.0 |
| 15 | 41.2 | 47.8 | 28.4 | 16.2 | 4.0 | 11.0 |
| 25 | 54.9 | 54.8 | 42.1 | 16.2 | 4.0 | 12.0 |
| 37 | 71.4 | 57.8 | 58.6 | 18.9 | 6.0 | 13.0 |
| 50 | 69.0 | 57.8 | 56.2 | 19.5 | 6.0 | 14.0 |



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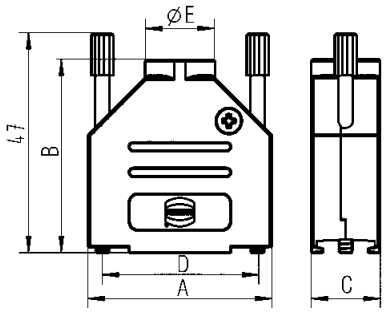
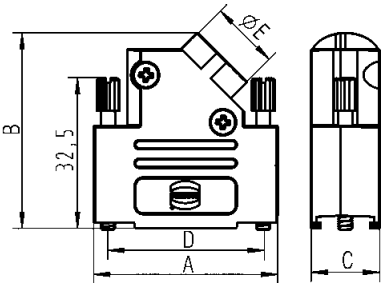
## Full metal top and side entry hoods with knurled screws

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Top entry hood incl. grommet set halves** | | | | |
| Please insert digit for screw option | 9 | 09 67 009 034 . | | |
| | 15 | 09 67 015 034 . | | |
| | 25 | 09 67 025 034 . | | |
| | 37 | 09 67 037 034 . | | |
| | 50 | 09 67 050 034 . | | |
| Knurled screw, thread 4-40 UNC ▶ 3 | | | | |
| Knurled screw, thread M3 ▶ 8 | | | | |
| Spare knurled screw thread 4-40 UNC | | 09 67 002 9029 | | |
| Spare knurled screw thread M3 | | 09 67 002 9101 | | |
| **Side entry hood incl. grommet set halves** | | | | |
| Please insert digit for screw option | 9[1)] | 09 67 009 033 . | | |
| | 15 | 09 67 015 033 . | | |
| | 25 | 09 67 025 033 . | | |
| | 37 | 09 67 037 033 . | | |
| | 50 | 09 67 050 033 . | | |
| Knurled screw, thread 4-40 UNC ▶ 3 | | | | |
| Knurled screw, thread M3 ▶ 6 | | | | |
| Spare knurled screw thread 4-40 UNC | | 09 67 002 9028 | | |
| Spare knurled screw thread M3 | | 09 67 001 9997 | | |
| **Spare grommet set halves** | | | | |
| 9-37 poles | | 09 67 002 9092 | | |
| 50 poles | | 09 67 002 9094 | | |

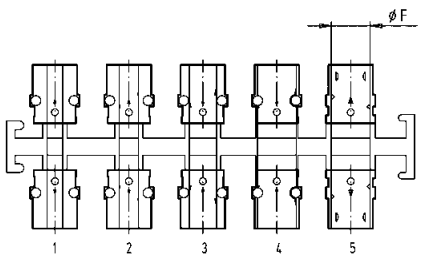


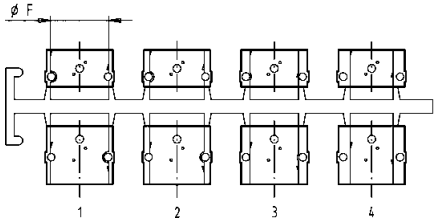

| Poles | A | B | C | D | E |
|---|---|---|---|---|---|
| 9 | 31.0 | 39.5 | 14.8 | 25.0 | 11.7 |
| 15 | 39.5 | 41.5 | 14.8 | 33.3 | 11.7 |
| 25 | 53.5 | 48.5 | 14.8 | 47.0 | 11.7 |
| 37 | 71.0 | 53.0 | 14.8 | 63.5 | 11.7 |
| 50 | 67.5 | 54.0 | 18.7 | 61.1 | 17.0 |






| Poles | A | B | C | D | E |
|---|---|---|---|---|---|
| 9 | 31.0 | 37.7 | 14.7 | – | 11.7 |
| 15 | 39.5 | 42.0 | 14.7 | 33.3 | 11.7 |
| 25 | 53.2 | 41.3 | 14.7 | 47.0 | 11.7 |
| 37 | 69.7 | 41.8 | 14.7 | 63.7 | 11.7 |
| 50 | 67.4 | 44.9 | 17.4 | 61.1 | 17.0 |




| Grommet dimensions | | |
|---|---|---|
| Number | Diameter F | |
| | 9-37 poles | 50 poles |
| 1 | 4.0 | 15.0 |
| 2 | 5.0 | 14.0 |
| 3 | 7.0 | 12.5 |
| 4 | 9.0 | 11.0 |
| 5 | 10.2 | – |

[1)] 9-pole hood provided with only one screw on the opposite side of the cable entry.
Operating temperature for all hoods on this page: -40 °C … +120 °C



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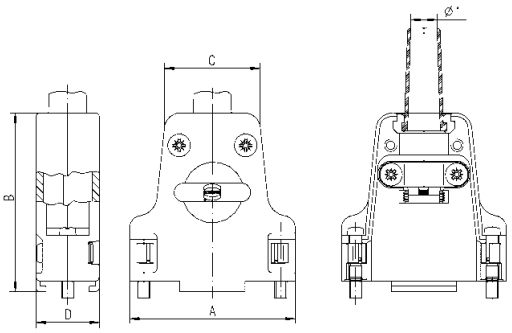
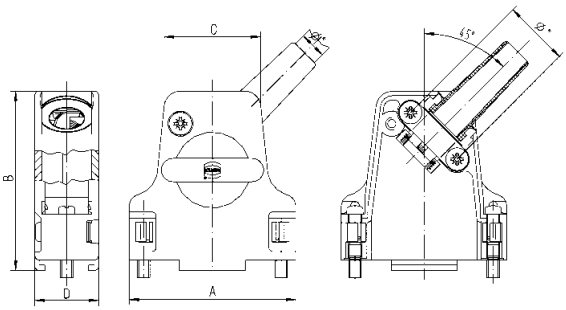
## Full metal top and side entry hoods with short screws

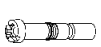
| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Top entry hood** | | | | |
| | 9 | 09 67 009 034 . | | |
| | 15 | 09 67 015 034 . | | |
| | 25 | 09 67 025 034 . | | |
| | 37 | 09 67 037 034 . | | |
| | 50 | 09 67 050 034 . | | |
| Please insert digit for screw option | | | | |
| Locking screw, thread 4-40 UNC ▶ 4 | | | | |
| Locking screw, thread M3 ▶ 9 | | | | |
| **Side entry hood** | | | | |
| | 9 | 09 67 009 033 . | | |
| | 15 | 09 67 015 033 . | | |
| | 25 | 09 67 025 033 . | | |
| | 37 | 09 67 037 033 . | | |
| | 50 | 09 67 050 033 . | | |
| Please insert digit for screw option | | | | |
| Locking screw, thread 4-40 UNC ▶ 4 | | | | |
| Locking screw, thread M3 ▶ 5 | | | | |
| **Spare short locking screw** | | | | |
| thread 4-40 UNC | | 09 67 002 9090 | | |
| thread M3 | | 09 67 002 9091 | | |




| Poles | A | B | C | D | Ø F1 | | Ø F2 | Ø F3 |
|---|---|---|---|---|---|---|---|---|
| | | | | | Min. | Max. | | |
| 9 | 31.8 | 42.4 | 20.8 | 15.4 | 3.0 | 9.5 | 6.5 | – |
| 15 | 40.3 | 43.5 | 23.3 | 15.4 | 3.0 | 8.5 | 6.5 | 12.5 |
| 25 | 54.0 | 47.7 | 31.7 | 15.4 | 3.0 | 8.5 | 8.0 | 12.5 |
| 37 | 70.2 | 50.4 | 48.2 | 18.4 | 3.0 | 12.0 | 9.0 | 15.0 |
| 50 | 67.8 | 50.5 | 45.8 | 18.2 | 3.0 | 12.0 | 9.7 | 15.0 |

* Cable diameter without rubber bushing = Ø F1
Cable diameter with rubber bushing = Ø F2
Cable diameter without rubber bushing and without cable reduction plate = Ø F3



Operating temperature for all hoods on this page: -35 °C … +100 °C



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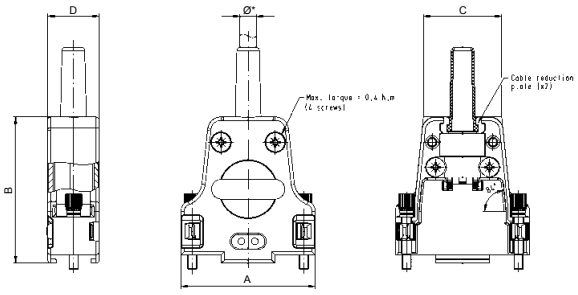
## Full metal top and side entry hoods with hexagonal screws

| Identification | No. of contacts | Part number |
|---|---|---|
| **Top entry hood** | | |
| | 9 | 09 67 009 032 . |
| | 15 | 09 67 015 032 . |
| | 25 | 09 67 025 032 . |
| | 37 | 09 67 037 032 . |
| | 50 | 09 67 050 032 . |
| Please insert digit for screw option | | |
| Hexagonal screw, thread 4-40 UNC ▶ 0 | | |
| Hexagonal screw, thread M3 ▶ 1 | | |
| **Side entry hood** | | |
| | 9 | 09 67 009 033 . |
| | 15 | 09 67 015 033 . |
| | 25 | 09 67 025 033 . |
| | 37 | 09 67 037 033 . |
| | 50 | 09 67 050 033 . |
| Please insert digit for screw option | | |
| Hexagonal screw, thread 4-40 UNC ▶ 8 | | |
| Hexagonal screw, thread M3 ▶ 9 | | |

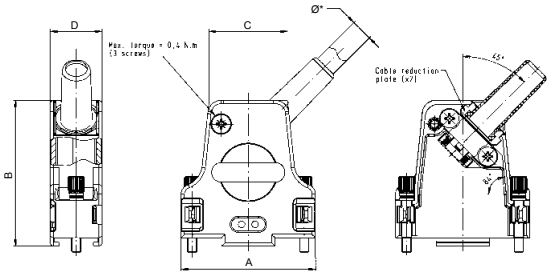
Drawing




Dimensions in mm

| Poles | A | B | C | D | Ø F1 Min. | Ø F1 Max. | Ø F2 | Ø F3 |
|---|---|---|---|---|---|---|---|---|
| 9 | 31.6 | 42.0 | 20.8 | 15.2 | 3.0 | 9.5 | 6.5 | – |
| 15 | 40.0 | 43.5 | 23.3 | 15.2 | 3.0 | 8.5 | 6.5 | 12.5 |
| 25 | 53.7 | 47.5 | 31.7 | 15.2 | 3.0 | 8.5 | 8.0 | 12.5 |
| 37 | 70.2 | 50.5 | 48.2 | 18.2 | 3.0 | 12.0 | 9.0 | 15.0 |
| 50 | 67.8 | 50.5 | 45.8 | 18.2 | 3.0 | 12.0 | 9.7 | 15.0 |

* Cable diameter without rubber bushing = Ø F1
Cable diameter with rubber bushing = Ø F2
Cable diameter without rubber bushing and without cable reduction plate = Ø F3



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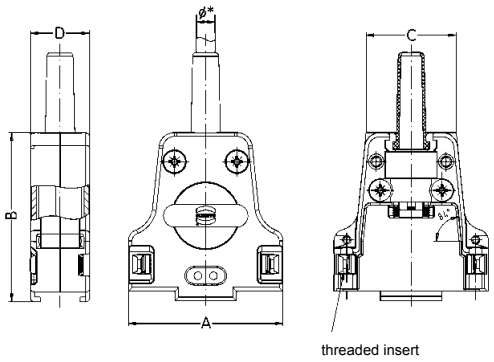
# Full metal top entry hoods with premounted threaded inserts

| Identification | No. of contacts | Part number |
|---|---|---|
| **Top entry hood** | | |
| | 9 | 09 67 009 032 . |
| | 15 | 09 67 015 032 . |
| | 25 | 09 67 025 032 . |
| | 37 | 09 67 037 032 . |
| | 50 | 09 67 050 032 . |
| Please insert digit for premounted insert | | |
| thread 4-40 UNC ▶ 2 | | |
| thread M3 ▶ 3 | | |
| **Locking hook** | | 09 67 002 9031[1] |
| **Latch lock bolt** | | |
| Front mount | | |
| thread 4-40 UNC | | 09 67 002 9041[1] |
| thread M3 | | 09 67 002 9042[1] |
| Rear mount | | |
| thread 4-40 UNC | | 09 67 002 9032[1] |
| thread M3 | | 09 67 002 9040[1] |
| Cable to cable | | |
| thread 4-40 UNC | | 09 67 002 9044[1] |
| thread M3 | | 09 67 002 9045[1] |

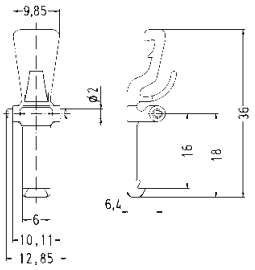
Drawing



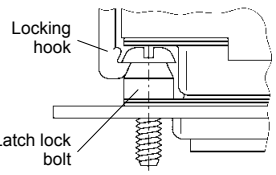

Dimensions in mm

| Poles | A | B | C | D | Ø F1 | | Ø F2 | Ø F3 |
|---|---|---|---|---|---|---|---|---|
| | | | | | Min. | Max. | | |
| 9 | 31.6 | 42.0 | 20.8 | 15.2 | 3.0 | 9.5 | 6.5 | – |
| 15 | 40.0 | 43.5 | 23.3 | 15.2 | 3.0 | 8.5 | 6.5 | 12.5 |
| 25 | 53.7 | 47.5 | 31.7 | 15.2 | 3.0 | 8.5 | 8.0 | 12.5 |
| 37 | 70.2 | 50.5 | 48.2 | 18.2 | 3.0 | 12.0 | 9.0 | 15.0 |
| 50 | 67.8 | 50.5 | 45.8 | 18.2 | 3.0 | 12.0 | 9.7 | 15.0 |

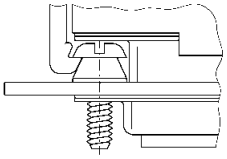
* Cable diameter without rubber bushing = Ø F1
Cable diameter with rubber bushing = Ø F2
Cable diameter without rubber bushing and without cable reduction plate = Ø F3



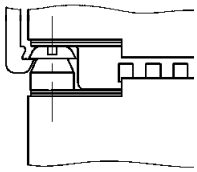

Front mount




Rear mount



Cable to cable



[1] Order 2 for each hood
Operating temperature for all hoods on this page: -35 °C … +100 °C



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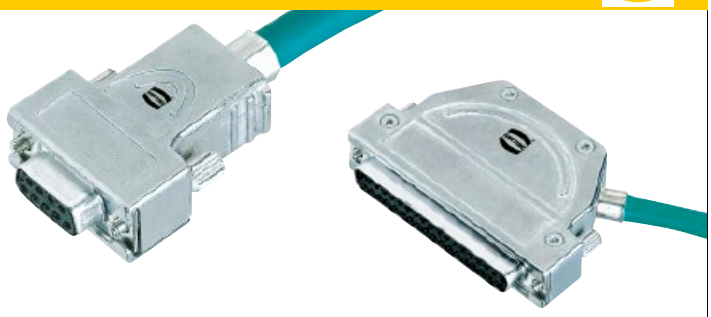


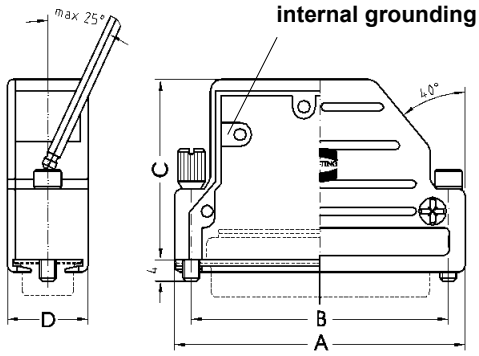
## Full metal top and side entry hoods with different screw options

| Identification | No. of contacts | Part number |
|---|---|---|
| **40° side entry hood** | | |
| **with** internal grounding block | 9 | 61 03 001 . 013 |
| | 15 | 61 03 001 . 014 |
| | 25 | 61 03 001 . 015 |
| **without** internal grounding block | 9 | 61 03 001 . 013 010 |
| **Top/side entry hood** | | |
| **with** internal grounding block | 9 | 61 03 001 . 010 |
| | 15 | 61 03 001 . 016 |
| | 25 | 61 03 001 . 017[1] |
| | 37 | 61 03 001 . 018[1] |
| | 50 | 61 03 001 . 019[1] |
| **without** internal grounding block | 9 | 61 03 001 . 010 010 |

Please insert digit for screw option

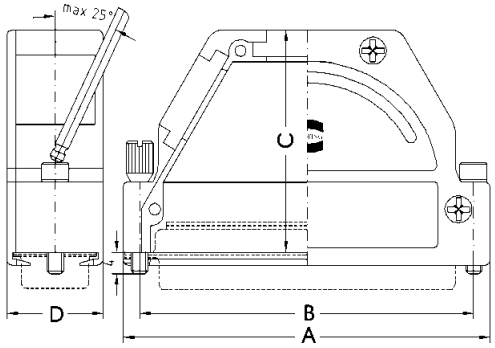
| | |
|---|---|
| Knurled screw, thread 4-40 UNC ▶ | 0 |
| Hexagonal screw, thread M3 with captive washer ▶ | 1 |
| Hexagonal screw, thread 4-40 UNC with captive washer ▶ | 2 |
| Knurled screw, thread M3 ▶ | 3 |

Drawing




Dimensions in mm

| No. of contacts | A | B | C | D |
|---|---|---|---|---|
| 9 | 31.0 | 25.0 | 35.0 | 15.0 |
| 15 | 39.3 | 33.3 | 35.0 | 15.0 |
| 25 | 53.0 | 47.0 | 35.0 | 15.0 |




| No. of contacts | No. of cable entries | A | B | C | D |
|---|---|---|---|---|---|
| 9 | 1 (top) | 31.0 | 25.0 | 38.0 | 15.0 |
| 15 | 1 (top) | 39.5 | 33.3 | 35.0 | 15.0 |
| 25 | 3 | 53.0 | 47.0 | 43.0 | 15.0 |
| 37 | 3 | 69.5 | 63.5 | 43.0 | 15.0 |
| 50 | 3 | 67.2 | 61.6 | 43.0 | 17.8 |

[1] Part number contains two blanking pieces
Operating temperature for all hoods on this page: -20 °C … +90 °C

Accessories see page 05.162





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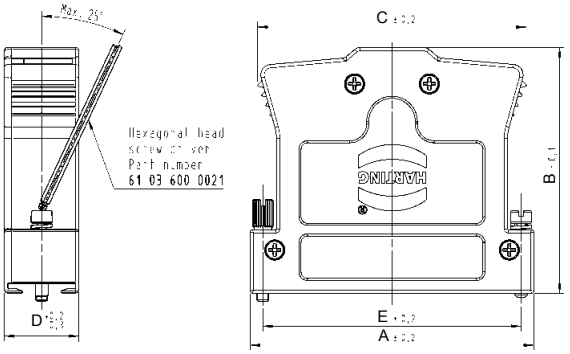
## Full metal top and side entry hoods with different screw options

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **5° top entry hood with 3 cable entries** | | | | |
| **with** internal grounding block | 37 | 61 03 001 . 118 | | |
| | 50 | 61 03 001 . 119 | | |
| **without** internal grounding block | 37 | 61 03 001 . 118 010 | | |
| | 50 | 61 03 001 . 119 010 | | |

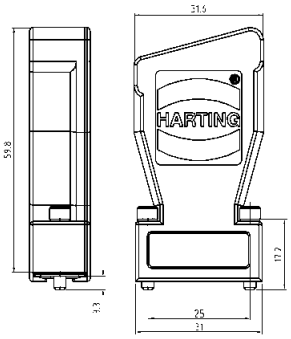



| No. of contacts | A | B | C | D | E |
|---|---|---|---|---|---|
| 37 | 69.5 | 52.0 | 58.2 | 14.8 | 63.5 |
| 50 | 67.1 | 58.0 | 63.6 | 17.6 | 61.1 |

Please insert digit for screw option

| | |
|---|---|
| Knurled screw, thread 4-40 UNC ▶ | 0 |
| Hexagonal screw, thread M3 ▶ with captive washer | 1 |
| Hexagonal screw, thread 4-40 UNC ▶ with captive washer | 2 |
| Knurled screw, thread M3 ▶ | 3 |

| | | | | |
|---|---|---|---|---|
| **Top entry hood** for InduCom 9 | | | | |
| Hexagonal screw, thread 4-40 UNC | 9 | 66 67 009 0346 | | |
| Hexagonal screw, thread M3 | 9 | 66 67 009 0347 | | |




2 cable entries



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# Notes





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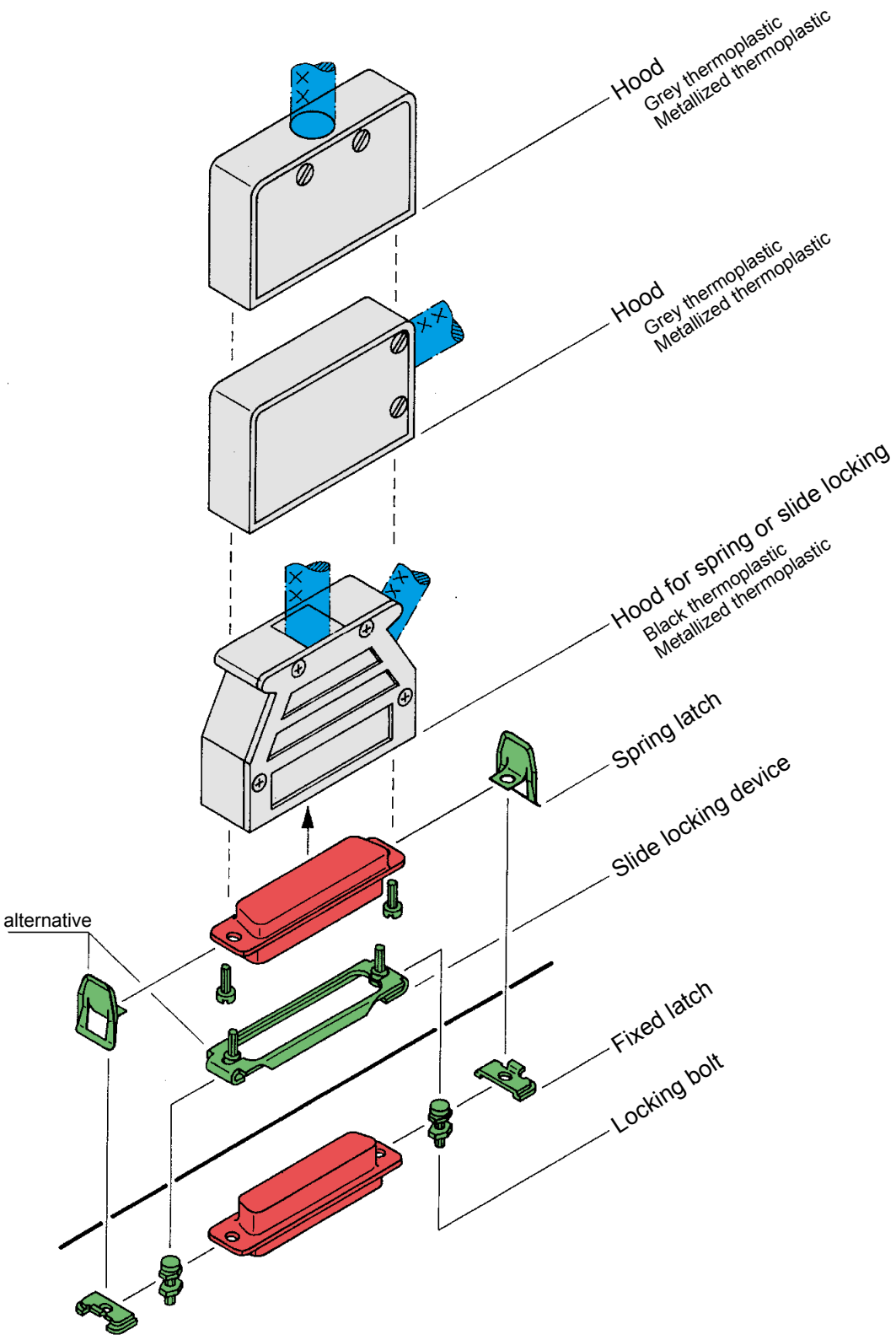
## Connector hoods for spring or slide locking

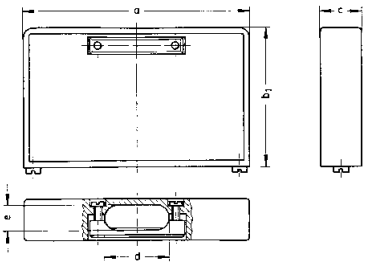




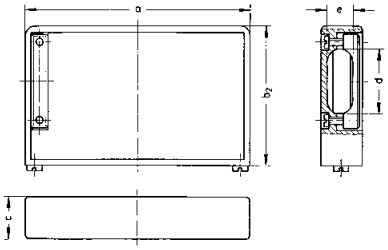

Downloaded from Arrow.com.

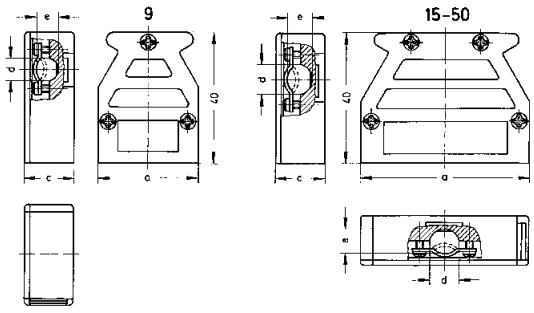
# Thermoplastic top and side entry hoods for spring or slide locking

| Identification | No. of contacts | Part number | | Drawing | Dimensions in mm |
|---|---|---|---|---|---|
| **Top entry hood** | | Thermoplastic grey[2] | Thermoplastic metallized[3] | | |
| 9-37 way for packaging density of 3 TE (15.24 mm) | 9 | 09 67 009 0411 | 09 67 009 0413 | | |
| | 15 | 09 67 015 0411 | 09 67 015 0413 | | |
| | 25 | 09 67 025 0411 | 09 67 025 0413 | | |
| | 37 | 09 67 037 0411 | 09 67 037 0413 | | |
| | 50 | 09 67 050 0411 | 09 67 050 0413 | | |
| **Side entry hood** | | Thermoplastic grey[2] | Thermoplastic metallized[3] | | |
| 9-37 way for packaging density of 3 TE (15.24 mm) | 9 | 09 67 009 0511 | 09 67 009 0513 | | |
| | 15 | 09 67 015 0511 | 09 67 015 0513 | | |
| | 25 | 09 67 025 0511 | 09 67 025 0513 | | |
| | 37 | 09 67 037 0511 | 09 67 037 0513 | | |
| | 50 | 09 67 050 0511 | 09 67 050 0513 | | |
| **Top and side entry hood** [1] | | Thermoplastic black[4] | Thermoplastic metallized[4] | | |
| [1] 9-poles is only side entry | 9 | 09 67 009 0452 | 09 67 009 0453 | | |
| | 15 | 09 67 015 0452 | 09 67 015 0453 | | |
| | 25 | 09 67 025 0452 | 09 67 025 0453 | | |
| | 37 | 09 67 037 0452 | 09 67 037 0453 | | |
| | 50 | 09 67 050 0452 | 09 67 050 0453 | | |



| | a | $b_1$ | $b_2$ | c | d | e min. | e max. |
|---|---|---|---|---|---|---|---|
| 9 | 31.0 | 23 | 28 | 12.8 | 10 | 5.75 | 9.0 |
| 15 | 39.4 | 28 | 28 | 12.8 | 10 | 5.75 | 9.0 |
| 25 | 53.3 | 34 | 34 | 12.8 | 14 | 5.75 | 9.0 |
| 37 | 69.7 | 43 | 43 | 12.8 | 20 | 5.75 | 9.0 |
| 50 | 67.1 | 41 | 41 | 15.8 | 20 | 5.75 | 11.6 |






| | a | c | d | e min. | e max. |
|---|---|---|---|---|---|
| 9 | 31.0 | 15.4 | 7 | 1.7 | 7.5 |
| 15 | 39.4 | 15.4 | 7 | 1.7 | 8.0 |
| 25 | 53.2 | 15.4 | 9 | 1.5 | 8.0 |
| 37 | 69.5 | 15.4 | 9 | 1.5 | 8.0 |
| 50 | 67.0 | 17.9 | 9 | 1.5 | 8.0 |

[2] Operating temperature: -55 °C … +120 °C
[3] Operating temperature: -35 °C … +60 °C
[4] Operating temperature: -20 °C … +90 °C

Accessories see page 05.159



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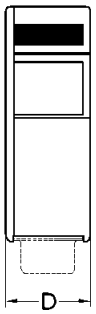
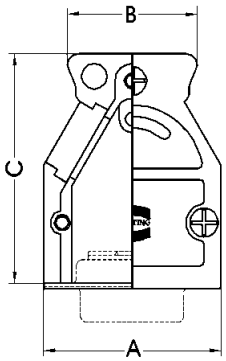
## Full metal top and side entry hoods for spring or slide locking

| Identification | No. of contacts | Part number |
|---|---|---|
| Top/side entry hood with spring/slide locking | 9 | 61 03 001 0022[1] |
| | 15 | 61 03 001 0011[2] |
| | 25 | 61 03 001 0012[2] |
| | 37 | 61 03 001 0021[2] |
| | 50 | 61 03 001 0020[2] |

Drawing




Dimensions in mm

| No. of contacts | No. of cable entries | A | B | C | D |
|---|---|---|---|---|---|
| 9 | 2 | 31.0 | 22.6 | 40.0 | 14.8 |
| 15 | 3 | 39.0 | 30.6 | 40.0 | 14.8 |
| 25 | 3 | 53.0 | 42.6 | 40.0 | 14.8 |
| 37 | 3 | 69.5 | 59.2 | 40.0 | 14.8 |
| 50 | 3 | 67.0 | 55.0 | 40.0 | 17.6 |

[1] Part number contains one blanking piece
[2] Part number contains two blanking pieces

Accessories see page 05.162



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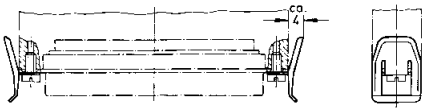
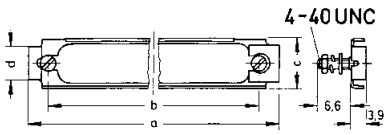
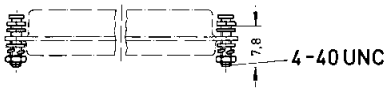
## Accessories for spring or slide locking hoods

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Spring latch | 9-50 | corrosion resistant steel<br>09 67 000 9907[1] |  | |
| Fixed latch[2] | 9-37<br>50 | corrosion resistant steel<br>09 67 001 9971[1]<br>09 67 001 9972[1] | | |
| Slide locking device | 9<br>15<br>25<br>37<br>50 | corrosion resistant steel<br>09 67 000 9914<br>09 67 000 9915<br>09 67 000 9916<br>09 67 000 9917<br>09 67 000 9918 |  | |
| Locking bolt | 9-50 | tinned<br>09 67 001 9973[1] |  | |

| | a | b | c | d |
|---|---|---|---|---|
| 9 | 35.0 | 25.0 | 11.7 | 8.6 |
| 15 | 43.3 | 33.3 | 11.5 | 8.6 |
| 25 | 57.0 | 47.0 | 11.7 | 8.6 |
| 37 | 74.3 | 63.5 | 11.7 | 8.6 |
| 50 | 72.0 | 61.1 | 14.7 | 11.2 |

[1] Order 2 for each connector
[2] Screws are not supplied with a fixed latch



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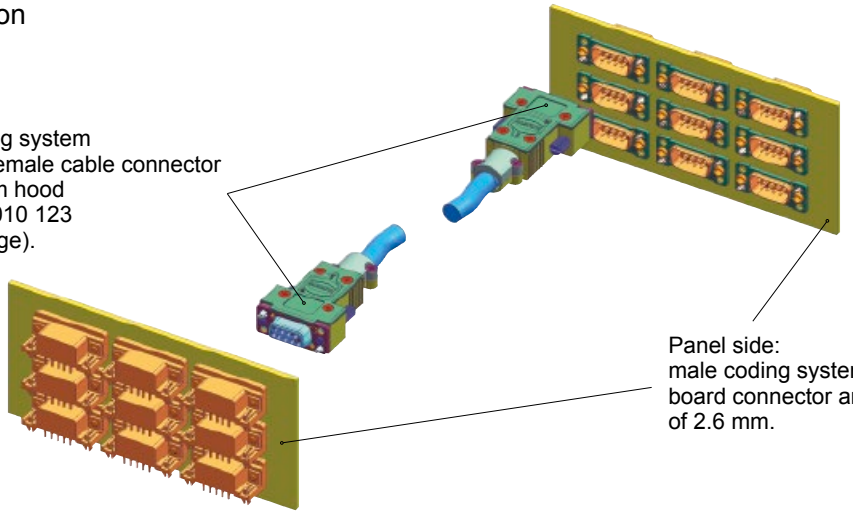
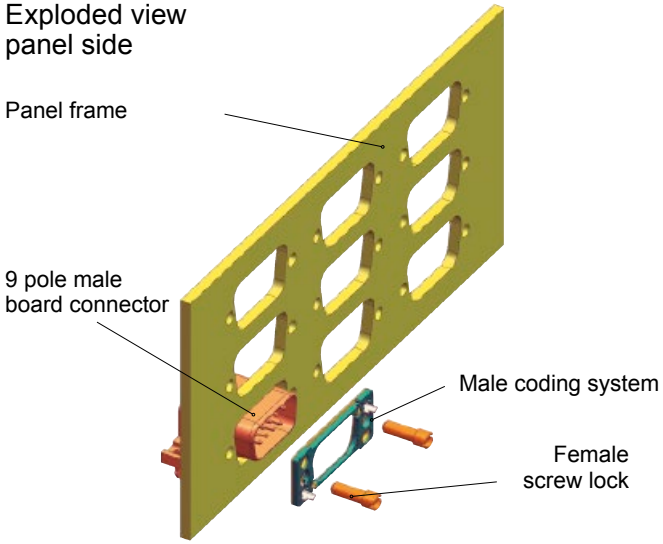
# Coding system

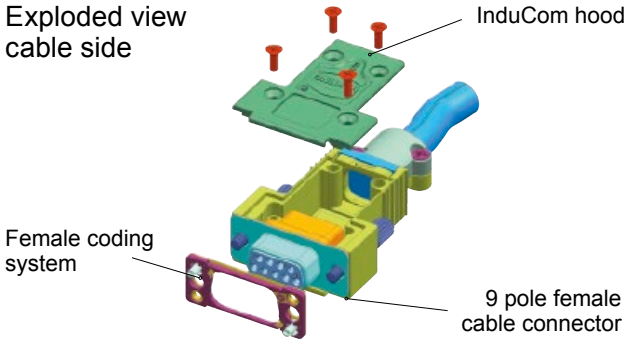
## Example of application




## Exploded view panel side

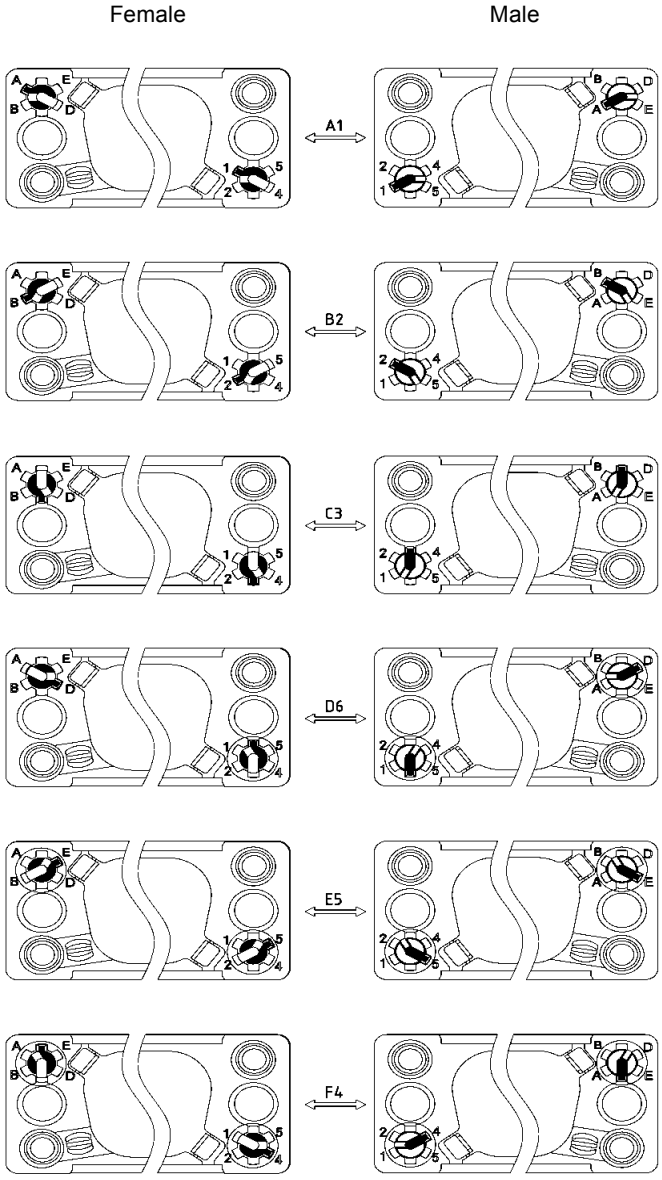



## Exploded view cable side




## Coding key details

## Standard coding combinations



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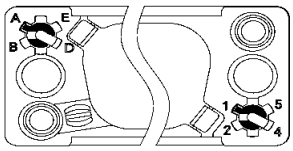
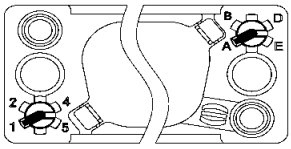
# Accessories – coding system

| Identification | Part number | Panel thickness | Dimensions in mm |
|---|---|---|---|
| **Coding**[1] | | | |
| Female | 09 67 002 9121 xx 1 | 2.40 - 2.60 mm[3] |  |
| | 09 67 002 9121 xx 2 | 2.00 - 2.40 mm | |
| | 09 67 002 9121 xx 3 | 1.20 - 2.00 mm | |
| | 09 67 002 9121 xx 4 | 0.80 - 1.20 mm | |
| Male | 09 67 002 9122 xx 1 | 2.40 - 2.60 mm[3] |  |
| | 09 67 002 9122 xx 2 | 2.00 - 2.40 mm | |
| | 09 67 002 9122 xx 3 | 1.20 - 2.00 mm | |
| | 09 67 002 9122 xx 4 | 0.80 - 1.20 mm | |
| Insert digits for coding configuration, e. g. "C3" | | 36 coding configurations[2] | |

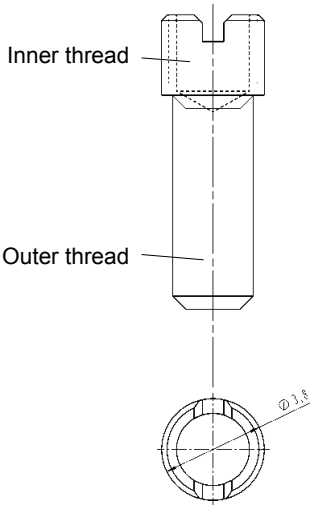
| | | | | | |
|---|---|---|---|---|---|
| **A1** | B1 | C1 | D1 | E1 | F1 |
| A2 | **B2** | C2 | D2 | E2 | F2 |
| A3 | B3 | **C3** | D3 | E3 | F3 |
| A4 | B4 | C4 | D4 | E4 | **F4** |
| A5 | B5 | C5 | D5 | **E5** | F5 |
| A6 | B6 | C6 | **D6** | E6 | F6 |

Depending on the panel thickness the suitable coding needs to be selected.

## Female screw lock

for angled PCB connectors[3]

| Thread inner | Thread outer | Part number | Panel thickness |
|---|---|---|---|
| 4 - 40 UNC | 4 - 40 UNC | 09 67 002 9123[4] | 2.00 - 2.60 mm |
| 4 - 40 UNC | M3 | 09 67 002 9124 | |
| M3 | 4 - 40 UNC | 09 67 002 9125 | |
| M3 | M3 | 09 67 002 9126 | |
| 4 - 40 UNC | 4 - 40 UNC | 09 67 002 9129 | 1.20 - 2.00 mm |
| 4 - 40 UNC | M3 | 09 67 002 9130 | |
| M3 | 4 - 40 UNC | 09 67 002 9131 | |
| M3 | M3 | 09 67 002 9132 | |
| 4 - 40 UNC | 4 - 40 UNC | 09 67 002 9133 | 0.80 - 1.20 mm |
| 4 - 40 UNC | M3 | 09 67 002 9134 | |
| M3 | 4 - 40 UNC | 09 67 002 9135 | |
| M3 | M3 | 09 67 002 9136 | |

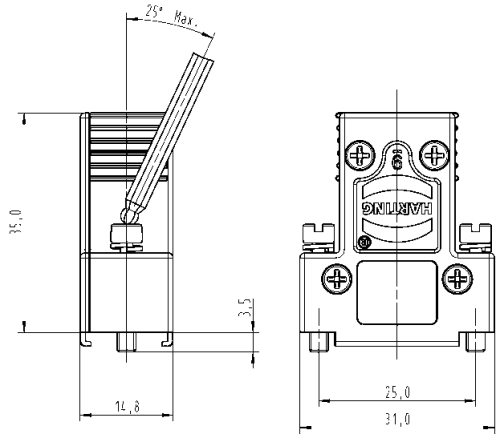



## 9 pole InduCom top entry hood for coding

61 03 001 . 010 123

Please insert digit for screw option

| | |
|---|---|
| Hexagonal screw, thread M3 ▶ with captive washer | 1 |
| Hexagonal screw, thread 4-40 UNC ▶ with captive washer | 2 |




[1] MOQ = 50 pieces
[2] Stock items (standard versions) in bold type
[3] Female screw lock for straight PCB connectors on request
[4] Standard versions



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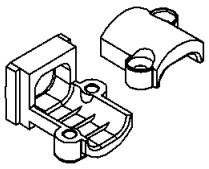
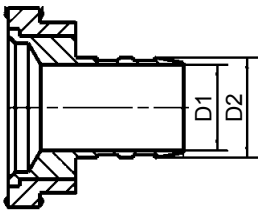
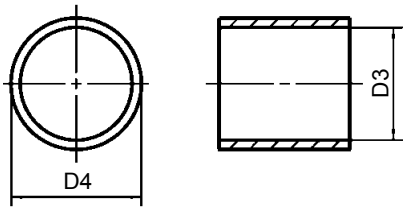
## Accessories for full metal hoods

| Identification | Part number for 9-37-pole D-Sub | Part number for 50-pole D-Sub | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Cable clamp** | | |  | |
| Cable-Ø appr. 5- 7 mm | 61 03 000 0141 | | | |
| Cable-Ø appr. 7-10 mm | 61 03 000 0044 | | | |
| Cable-Ø appr. 9-12 mm | 61 03 000 0143 | | | |
| Cable-Ø appr. 11-14 mm | 61 03 000 0148 | 61 03 000 0145 | | |
| Cable-Ø appr. 14-16 mm | | 61 03 000 0147 | | |
| **Crimp flange** | 61 03 000 0062<br>61 03 000 0063<br>61 03 000 0064<br>61 03 000 0065<br>61 03 000 0066<br>61 03 000 0166<br>61 03 000 0067<br>61 03 000 0068<br>61 03 000 0069<br>61 03 000 0070<br>61 03 000 0071<br>61 03 000 0165<br>61 03 000 0072 | 61 03 000 5062<br>61 03 000 5063<br>61 03 000 5064<br>61 03 000 5065<br>61 03 000 5066<br>61 03 000 5166<br>61 03 000 5067<br>61 03 000 5068<br>61 03 000 5069<br>61 03 000 5070<br>61 03 000 5071<br>61 03 000 5165<br>61 03 000 5072 |  | D1 / D2<br>3.0 / 4.0<br>3.5 / 4.5<br>4.0 / 5.0<br>4.5 / 5.5<br>5.0 / 6.0<br>5.5 / 6.5<br>6.0 / 7.0<br>6.5 / 7.5<br>7.0 / 8.0<br>7.5 / 8.5<br>8.0 / 9.0<br>8.5 / 9.5<br>9.0 / 10.0 | |
| **Crimp ferrule** | 61 03 000 0045<br>61 03 000 0046<br>61 03 000 0047<br>61 03 000 0048<br>61 03 000 0049<br>61 03 000 0050<br>61 03 000 0051<br>61 03 000 0052<br>61 03 000 0053<br>61 03 000 0054<br>61 03 000 0055<br>61 03 000 0056<br>61 03 000 0057<br>61 03 000 0058<br>61 03 000 0142<br>61 03 000 0059<br>61 03 000 0127<br>61 03 000 0060<br>61 03 000 0061 | |  | D3 / D4<br>5.0 / 6.0<br>5.5 / 6.5<br>6.0 / 7.0<br>6.5 / 7.5<br>7.0 / 8.0<br>7.5 / 8.5<br>8.0 / 9.0<br>8.5 / 9.5<br>9.0 / 10.0<br>9.5 / 10.5<br>10.0 / 11.0<br>10.5 / 11.5<br>11.0 / 12.0<br>11.5 / 12.5<br>12.0 / 13.0<br>12.5 / 13.5<br>13.0 / 14.0<br>13.7 / 15.0<br>14.0 / 15.0 | |
| **Blanking piece** for hoods | 61 03 000 0042 | 61 03 000 0041 | | |
| **Hexagonal screw** thread 4-40 UNC x 17.5-8.8 with captive washer | 09 67 002 9020 | | | |
| **Hexagonal screw** thread M3 x 17.5-8.8 with captive washer | 09 67 002 9019 | | | |
| **Knurled screw** thread 4-40 UNC | 09 67 002 9018 | | | |
| **Knurled screw** thread M3 | 09 67 002 9017 | | | |

Tooling see chapter 20
Operating temperature for all components on this page: -20 °C … +90 °C



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## Crimp flange termination instruction

1. Strip the cable sheath to the correct length (approx. 35 to 40 mm, depending on interface type).

2. Place the crimp ferrule over the cable sheath. Bend the outer screen backwards over the cable sheath. Cut screen approx. 2 mm from the end of the cable sheath.

3. Place the crimp flange over the wires covered by the remaining foil shield. Push and twist the crimp flange under the outer screen and cable sheath until the end of the cable sheath touches the crimp flange. HARTING has developed a special tool for optimised installation of the shielding over the crimp flange, part number 61 03 600 0017.

4. Move the crimp ferrule back onto the crimp flange and crimp the two parts together with the special service crimp tool part number 61 03 600 0020. For an optimised crimp process the tool should to be positioned as close as possible to the crimp flange sholder.

5. Cut off the internal screen foil and push the crimp flange inside the metal hood.

**HARTING offers to test and define the best crimp flange and ferrule combination for customer specific cables.**





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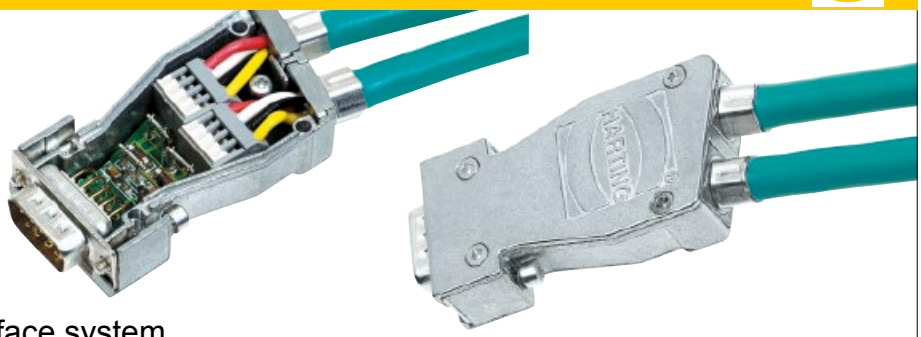
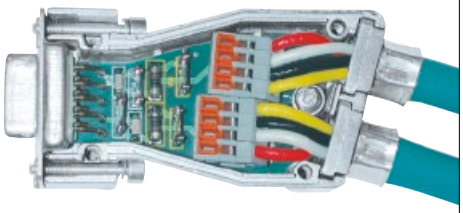
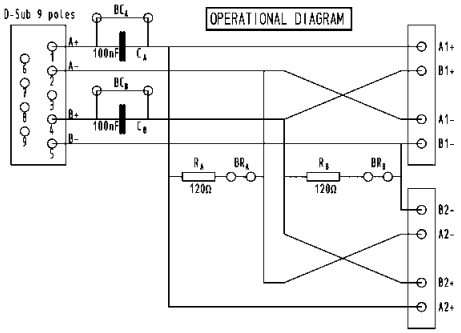
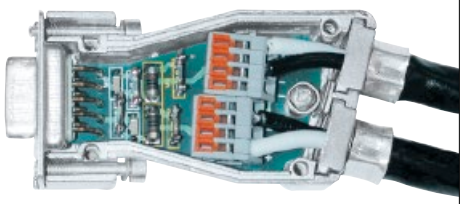
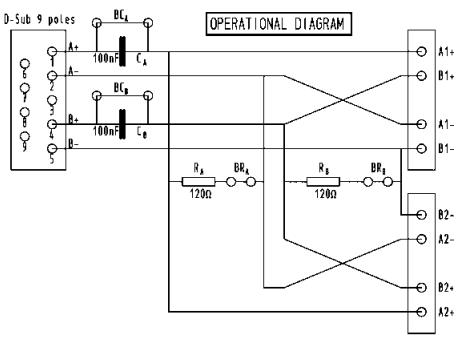


## InduCom 9 – Industrial bus interface system



| Identification | Part number | General information |
|---|---|---|
| MVB Interface<br>  <br>  | 66 63 009 5013 | **MVB backbone interface set**<br>The Multifunctional Vehicle Bus (MVB) backbone interface is specially designed for communication cables in Train Control Networks (TCN). With this interface it is possible to realise a T-bus structure with MVB-cable with which you can disconnect the bus interface from the control unit without any interruption of the complete bus communication. On the PCB you will have load resistors and test capacitors which can be activated with solder bridges. The wires are terminated with the proven vibration resistant cage clamp technology.*<br>**Components of the MVB interface set:**<br>• 1 metal housing with 2 cable entries<br>• 2 hexagonal screws with UNC 4-40 threads<br>• 1 PCB with 9 way D-Sub male connector and cage clamps<br>• 2 crimp flanges for the MVB cable<br>• 2 crimp ferrules for the MVB cable<br>• 1 blanking piece |
| WTB Interface<br>  <br>  | 66 63 009 5014 | **WTB backbone interface set**<br>The Wired Train Bus (WTB) backbone interface is specially designed for backbone cables in Train Control Networks (TCN). With this interface it is possible to realise a T-bus structure with WTB-cable with which you can disconnect the bus interface from the control unit without any interruption of the complete bus communication. On the PCB you will have load resistors and test capacitors which can be activated with solder bridges. The wires are terminated with the proven vibration resistant cage clamp technology.*<br>**Components of the MVB interface set:**<br>• 1 metal housing with 2 cable entries<br>• 2 hexagonal screws with UNC 4-40 threads<br>• 1 PCB with 9 way D-Sub male connector and cage clamps<br>• 2 crimp flanges for the WTB cable<br>• 2 crimp ferrules for the WTB cable<br>• 1 blanking piece |

Further bus PCBs on request

* To check compatibility with cable types and manufacturers, please contact your local HARTING representative.



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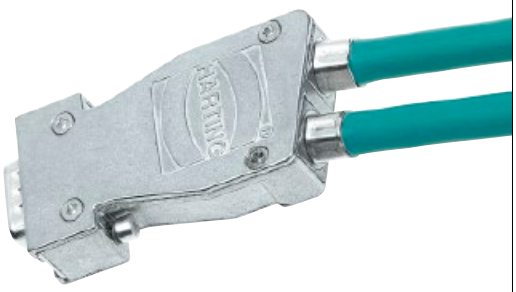
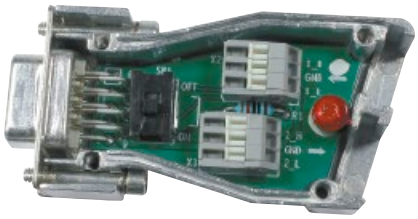
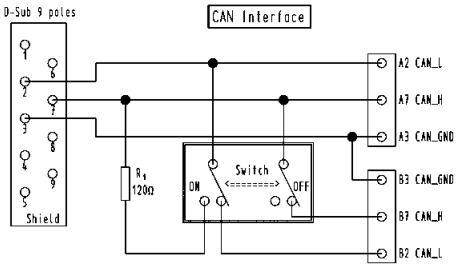
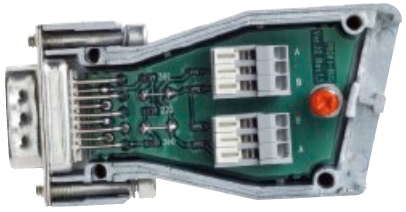
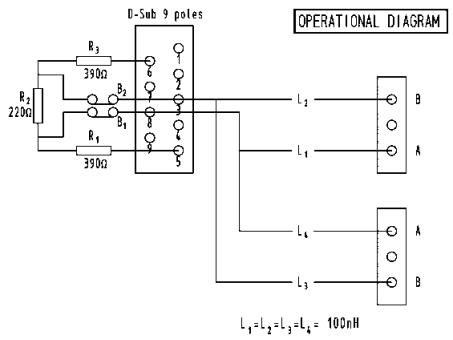


## InduCom 9 – Industrial bus interface system

| Identification | Part number | General information |
|---|---|---|
| **CAN Interface**<br>  <br>  | 66 63 009 6016 | The Controller Area Network (CAN)-Interface is specially designed for usage in trains. With this interface it is possible to realise a T-bus structure with which you can disconnect the bus interface from the control unit without any interruption of the complete bus communication. On the PCB you will have a load resistor which can be activated with the switch.*<br><br>**Components of the interface set:**<br>• 1 metal housing with 2 cable entries<br>• 2 hexagonal screws with UNC 4-40 threads<br>• 1 PCB with 9 way D-Sub female connector and 2 cage clamps<br>• 1 blanking piece<br>• 2 crimp flanges<br>• 2 crimp ferrules |
| **Profibus Interface**<br>  <br>  | 66 63 009 6004 | The Profibus Interface is specially designed for usage in trains and in challenging engineering applications.<br><br>On the PCB you will have SMD parts which can be activated with solder bridges.<br><br>The wires are assembled with the proven vibration resistant cage clamp technology.*<br><br>**Components of the interface set:**<br>• 1 metal housing with 2 cable entries<br>• 2 hexagonal screws with UNC 4-40 threads<br>• 1 PCB with 9 way D-Sub female connector and 2 cage clamps<br>• 1 blanking piece |

Further bus PCBs on request

* To check compatibility with cable types and manufacturers, please contact your local HARTING representative.





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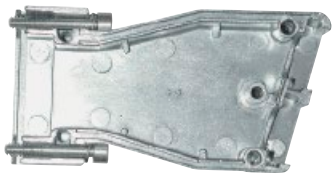
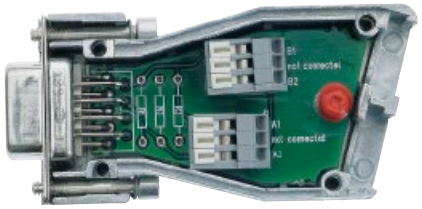
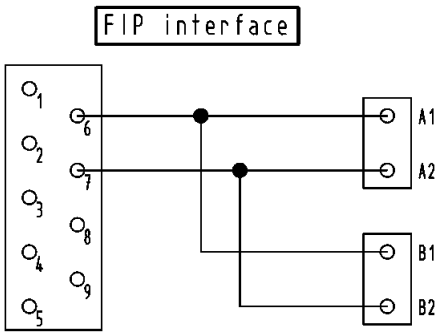
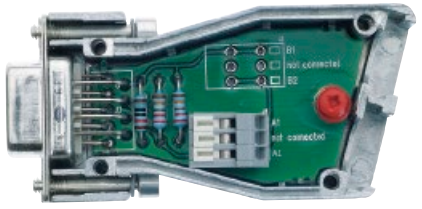
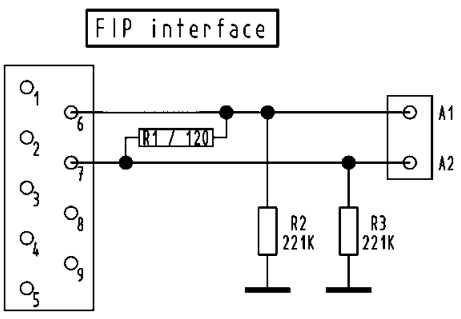


## InduCom 9 – Industrial bus interface system



| Identification | Part number | General information |
|---|---|---|
| FIP Interface middle of the line<br>  <br>  | 66 63 009 5017 | The FIP (Factory Installation Protocol) Interface is specially designed for applications in trains. It is connected via the D-Sub. The wires are assembled with the proven vibration resistant cage clamp technology.*<br><br>**Components of the interface set:**<br>• 1 metal housing with 2 cable entries<br>• 2 hexagonal screws with UNC 4-40 threads<br>• 1 pcb with 9 way D-Sub female connector and cage clamps |
| FIP Interface end of the line<br>  <br>  | 66 63 009 5018 | The FIP (Factory Installation Protocol) Interface is specially designed for applications in trains. It is connected via the D-Sub. On the pcb you will have load resistors. The wires are assembled with the proven vibration resistant cage clamp technology.*<br><br>**Components of the interface set:**<br>• 1 metal housing with 2 cable entries<br>• 2 hexagonal screws with UNC 4-40 threads<br>• 1 pcb with 9 way D-Sub female connector and cage clamps<br>• 1 blanking piece |



Further bus PCBs on request

* To check compatibility with cable types and manufacturers, please contact your local HARTING representative.

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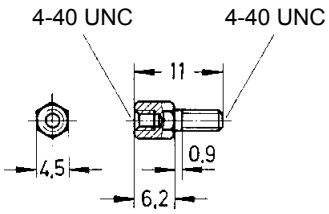
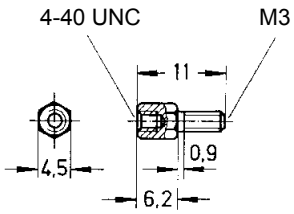
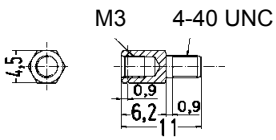
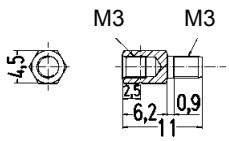
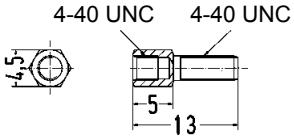
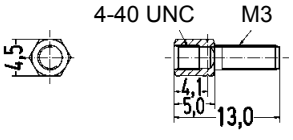
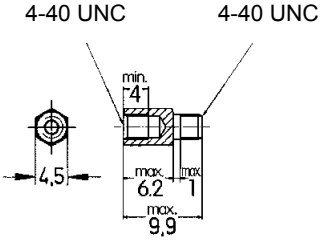
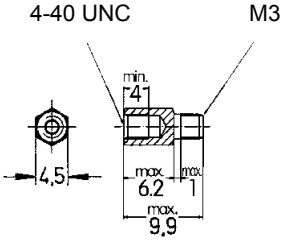
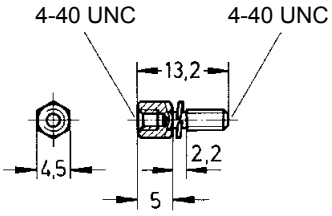
## Accessories

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Female screw locks** without nut | | | | |
| Thread UNC/UNC | 9-50 | 09 67 000 9972[1] |  |  |
| Thread UNC/M3 | 9-50 | 09 67 000 9974[1] | | |
| Thread M3/UNC | 9-50 | 09 67 001 9976[1] |  |  |
| Thread M3/M3 | 9-50 | 09 67 001 9974[1] | | |
| Thread UNC/UNC | 9-50 | 09 67 001 9941[1] |  |  |
| Thread UNC/M3 | 9-50 | 09 67 001 9954[1] | | |
| for press-in connectors with grounding-pins or straight solder with grounding-clips. | | | | |
| Thread UNC/UNC | 9-50 | 09 66 000 9972[1] |  |  |
| Thread UNC/M3 | 9-50 | 09 66 000 9974[1][2] | | |
| with captive washer | | | | |
| Thread UNC/UNC | 9-50 | 09 67 001 9957[1] |  | |

[1] Order 2 for each connector
[2] M3 inner thread available on request

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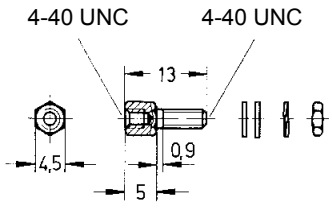
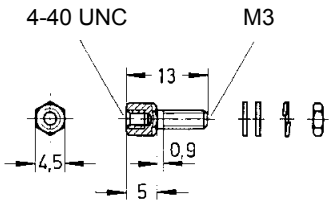
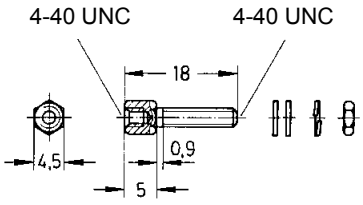
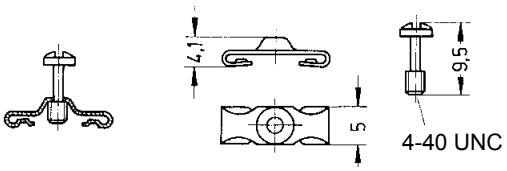
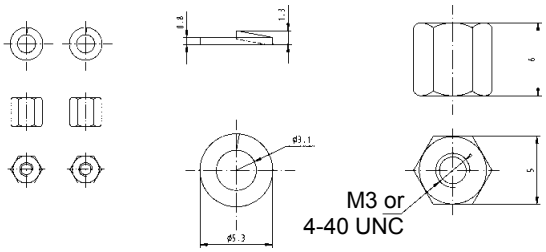
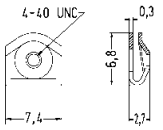
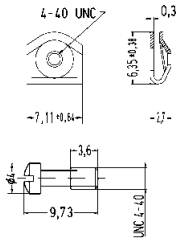
## Accessories

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Female screw locks**<br>with nut | | | | |
| Thread UNC/UNC | 9-50 | 09 67 000 9922[1)] |  | |
| Thread UNC/M3 | 9-50 | 09 67 000 9924[1)] |  | |
| Thread UNC/UNC | 9-50 | 09 67 000 9973[1)] |  | |
| **Male screw locks**<br>for use without hood | | | | |
| | 9-37<br>50 | 09 67 001 9969[1)]<br>09 67 001 9970[1)] |  | |
| **Hex extender** | | | | |
| Thread 4-40 UNC | 9-50 | 09 67 001 9985 |  | |
| Thread M3 | 9-50 | 09 67 002 9120 | | |
| **U-Clip**<br>with thread<br>4-40 UNC | 9-50 | 09 67 001 9928[1)] |  | |
| with thread<br>4-40 UNC<br>and screw-lock | 9-50 | 09 67 002 9030[1)] |  | |

[1)] Order 2 for each connector



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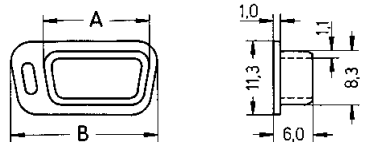
## Accessories

### Dust cap
black
thermoplastic

for male connector

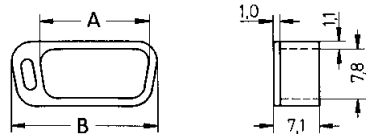
| No. of contacts | Part number |
|---|---|
| 9 | 09 67 009 0611 |
| 15 | 09 67 015 0611 |
| 25 | 09 67 025 0611 |
| 37 | 09 67 037 0611 |




| | A | B |
|---|---|---|
| 9 | 17.0 | 22.40 |
| 15 | 25.3 | 30.80 |
| 25 | 38.9 | 44.40 |
| 37 | 55.4 | 60.75 |

for female connector

| No. of contacts | Part number |
|---|---|
| 9 | 09 67 009 0711 |
| 15 | 09 67 015 0711 |
| 25 | 09 67 025 0711 |
| 37 | 09 67 037 0711 |

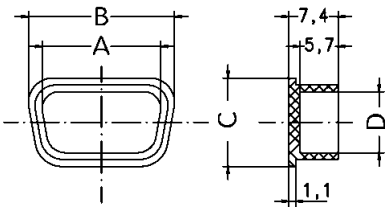



| | A | B |
|---|---|---|
| 9 | 16.0 | 22.5 |
| 15 | 24.4 | 31.0 |
| 25 | 37.8 | 44.3 |
| 37 | 54.3 | 60.8 |

**anstistatic**
black
thermoplastic

for male connector

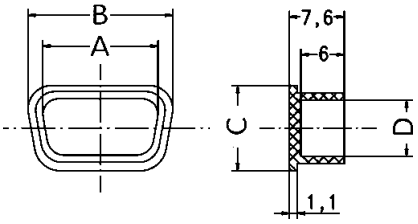
| No. of contacts | Part number |
|---|---|
| 9 | 09 67 009 0612 |
| 15 | 09 67 015 0612 |
| 25 | 09 67 025 0612 |
| 37 | 09 67 037 0612 |
| 50 | 09 67 050 0612 |




| | A | B | C | D |
|---|---|---|---|---|
| 9 | 17.7 | 21.8 | 13.2 | 9.1 |
| 15 | 26.0 | 30.0 | 13.2 | 9.1 |
| 25 | 40.0 | 44.2 | 13.2 | 9.1 |
| 37 | 56.4 | 59.8 | 13.2 | 9.1 |
| 50 | 53.9 | 57.8 | 15.9 | 11.7 |

for female connector

| No. of contacts | Part number |
|---|---|
| 9 | 09 67 009 0712 |
| 15 | 09 67 015 0712 |
| 25 | 09 67 025 0712 |
| 37 | 09 67 037 0712 |
| 50 | 09 67 050 0712 |

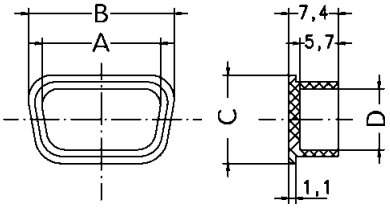



| | A | B | C | D |
|---|---|---|---|---|
| 9 | 15.9 | 20.0 | 11.8 | 7.8 |
| 15 | 24.4 | 28.5 | 11.8 | 7.8 |
| 25 | 38.3 | 42.3 | 11.8 | 7.8 |
| 37 | 54.7 | 58.8 | 11.8 | 7.8 |
| 50 | 52.6 | 56.2 | 14.5 | 10.5 |

**UL 94 V0**
grey
thermoplastic

for male connector

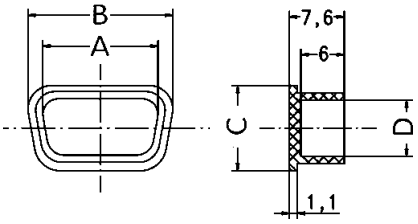
| No. of contacts | Part number |
|---|---|
| 9 | 09 67 009 0613 |
| 15 | 09 67 015 0613 |
| 25 | 09 67 025 0613 |
| 37 | 09 67 037 0613 |
| 50 | 09 67 050 0613 |




| | A | B | C | D |
|---|---|---|---|---|
| 9 | 17.7 | 21.8 | 13.2 | 9.1 |
| 15 | 26.0 | 30.0 | 13.2 | 9.1 |
| 25 | 40.0 | 44.2 | 13.2 | 9.1 |
| 37 | 56.4 | 59.8 | 13.2 | 9.1 |
| 50 | 53.9 | 57.8 | 15.9 | 11.7 |

for female connector

| No. of contacts | Part number |
|---|---|
| 9 | 09 67 009 0713 |
| 15 | 09 67 015 0713 |
| 25 | 09 67 025 0713 |
| 37 | 09 67 037 0713 |
| 50 | 09 67 050 0713 |




| | A | B | C | D |
|---|---|---|---|---|
| 9 | 15.9 | 20.0 | 11.8 | 7.8 |
| 15 | 24.4 | 28.5 | 11.8 | 7.8 |
| 25 | 38.3 | 42.3 | 11.8 | 7.8 |
| 37 | 54.7 | 58.8 | 11.8 | 7.8 |
| 50 | 52.6 | 56.2 | 14.5 | 10.5 |



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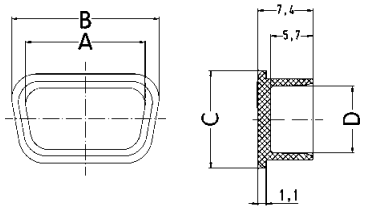
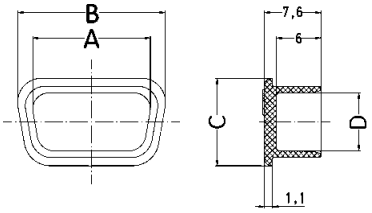
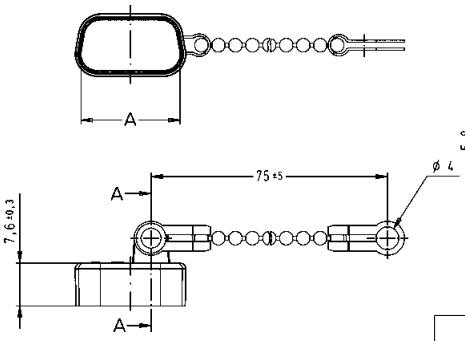
## Accessories

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Dust cap** | | | | |
| metallized thermoplastic | | | | |
| for male connector | 9 | 09 67 009 0614 |  | |
| | 15 | 09 67 015 0614 | | |
| | 25 | 09 67 025 0614 | | |
| | 37 | 09 67 037 0614 | | |
| | 50 | 09 67 050 0614 | | |

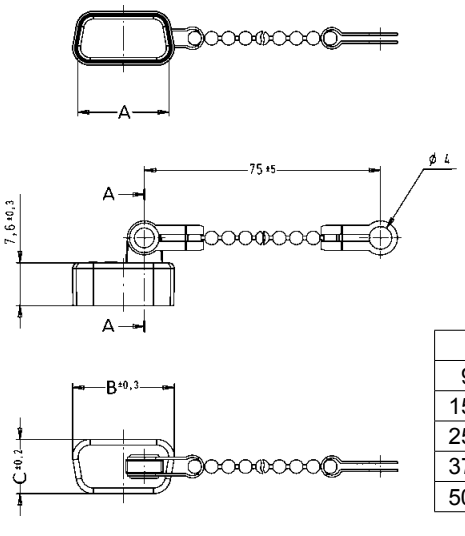
| | A | B | C | D |
|---|---|---|---|---|
| 9 | 17.7 | 21.8 | 13.2 | 9.1 |
| 15 | 26.0 | 30.0 | 13.2 | 9.1 |
| 25 | 40.0 | 44.2 | 13.2 | 9.1 |
| 37 | 56.4 | 59.8 | 13.2 | 9.1 |
| 50 | 53.9 | 57.8 | 15.9 | 11.7 |

| | | | | |
|---|---|---|---|---|
| for female connector | 9 | 09 67 009 0714 |  | |
| | 15 | 09 67 015 0714 | | |
| | 25 | 09 67 025 0714 | | |
| | 37 | 09 67 037 0714 | | |
| | 50 | 09 67 050 0714 | | |

| | A | B | C | D |
|---|---|---|---|---|
| 9 | 15.9 | 20.0 | 11.8 | 7.8 |
| 15 | 24.4 | 28.5 | 11.8 | 7.8 |
| 25 | 38.3 | 42.3 | 11.8 | 7.8 |
| 37 | 54.7 | 58.8 | 11.8 | 7.8 |
| 50 | 52.6 | 56.2 | 14.5 | 10.5 |

| | | | | |
|---|---|---|---|---|
| metallized thermoplastic with chain | | | | |
| for male connector | 9 | 09 67 009 0615 |  | |
| | 15 | 09 67 015 0615 | | |
| | 25 | 09 67 025 0615 | | |
| | 37 | 09 67 037 0615 | | |
| | 50 | 09 67 050 0615 | | |

| | A | B | C | D |
|---|---|---|---|---|
| 9 | 17.5 | 19.6 | 11.1 | 9.2 |
| 15 | 25.7 | 27.8 | 11.1 | 9.2 |
| 25 | 39.6 | 41.8 | 11.1 | 9.2 |
| 37 | 55.7 | 57.4 | 11.1 | 9.2 |
| 50 | 53.4 | 55.3 | 13.8 | 11.9 |

| | | | | |
|---|---|---|---|---|
| for female connector | 9 | 09 67 009 0715 |  | |
| | 15 | 09 67 015 0715 | | |
| | 25 | 09 67 025 0715 | | |
| | 37 | 09 67 037 0715 | | |
| | 50 | 09 67 050 0715 | | |

| | A | B | C | D |
|---|---|---|---|---|
| 9 | 16.2 | 18.0 | 9.6 | 7.8 |
| 15 | 24.6 | 26.4 | 9.6 | 7.8 |
| 25 | 38.4 | 40.2 | 9.6 | 7.8 |
| 37 | 54.4 | 56.2 | 9.6 | 7.8 |
| 50 | 52.0 | 53.7 | 12.2 | 10.4 |



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| | |
|---|---|
| Number of contacts | 9, 15, 25, 37, 50<br>UL recognized |
| Working current<br>see current carrying capacity chart<br>Stamped contacts | <br><br>6.5 A max. |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Clearance and creepage | ≥ 1.0 mm |
| Contact resistance<br>Insulation resistance | ≤ 10 mΩ<br>≥ $10^{10}$ Ω |
| Temperature range<br>The higher temperature limit includes the local ambient and heating effect of the contacts under load | -55 °C … +125 °C |

**Terminations** Recommended PCB through holes

| | | *Signal pin* | *Grounding pin* |
|---|---|---|---|
| *Tin-lead plated PCB* | Hole | $1.15^{-0.03}$ | $3.15^{\pm 0.025}$ |
| | Cu | 25-75 µm | 25-75 µm |
| | Sn | 5-15 µm | 4-10 µm |
| | Plated hole | 0.94-1.09 mm | 3.0-3.15 mm |
| *Chemical tin-plated PCB* | Hole | $1.05^{-0.03}$ | $3.15^{\pm 0.025}$ |
| | Cu | 25-50 µm | 25-50 µm |
| | Sn | 0.8-1.0 µm | 0.8-1.0 µm |
| | Plated hole | 1.00-1.10 mm | 3.0-3.15 mm |
| *Au / Ni plated PCB* | Hole | $1.15^{-0.03}$ | $3.15^{\pm 0.025}$ |
| | Cu | 25-50 µm | 25-50 µm |
| | Ni | 3-7 µm | 4-7 µm |
| | Au | 0.05-0.12 µm | 0.05-0.12 µm |
| | Plated hole | 1.00-1.10 mm | 3.0-3.15 mm |
| *Silver plated PCB* | Hole | $1.15^{-0.03}$ | $3.15^{\pm 0.025}$ |
| | Cu | 25-50 µm | 25-50 µm |
| | Ag | 0.1-0.3 µm | 0.1-0.3 µm |
| | Plated hole | 1.00-1.10 mm | 3.0-3.15 mm |
| *OSP copper plated PCB* | Hole | $1.15^{-0.03}$ | $3.15^{\pm 0.025}$ |
| | Cu | 25-50 µm | 25-50 µm |
| | Plated hole | 1.00-1.10 mm | 3.0-3.15 mm |

PCB board thickness: ≥ 1.6 mm

**Materials**

| | |
|---|---|
| Mouldings and hoods | Liquid Crystal Polymer (LCP)<br>UL 94-V0 |
| Contacts | Copper alloy |
| **Contact surface** | |
| Contact zone | selectively plated<br>acc. to performance level[1)] |
| Metal shell | Plated steel |

**Insertion and withdrawal force**

Connector on P.C.B.

Press-in without grounding pins
- – insertion max. per contact: 120 N
- – withdrawal min. per contact: 20 N

Press-in with grounding pins
- – insertion max. per grounding pin: 250 N
- – withdrawal min. per grounding pin: 30 N

**Mating force**

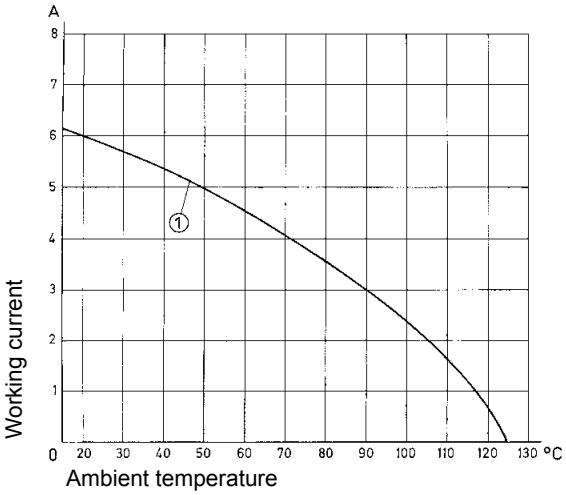
| | |
|---|---|
| 9 way | ≤ 30 N |
| 15 way | ≤ 50 N |
| 25 way | ≤ 83 N |
| 37 way | ≤ 123 N |
| 50 way | ≤ 167 N |

## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.

The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

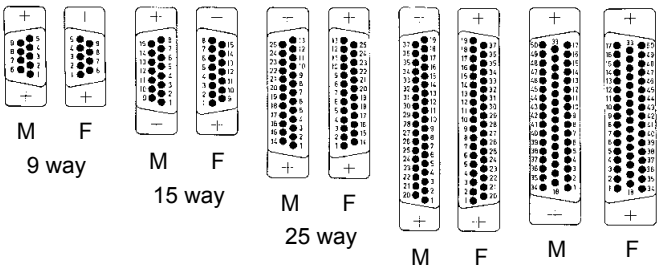
Control and test procedures according to DIN IEC 60 512.




Example: 25 way connector

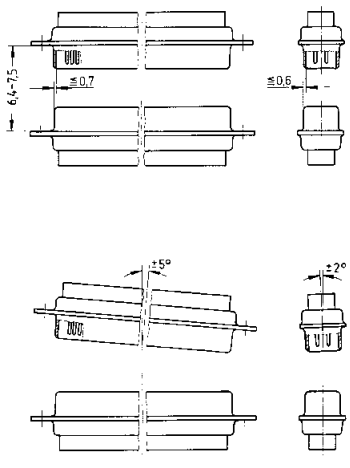
① Stamped contacts

## Contact arrangement View from termination side




M = Male connector
F = Female connector

## Mating conditions as per DIN 41 652




[1)] Performance level 3, 50 mating cycles, no gas test
Performance level 2 as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512
Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512



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Number of contacts

# 9–50

## Press-in, straight with grounding press-in board locks



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.171<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector** | | | |
| Flange height x = 5.7 mm | | | |
| metal shell with dimples | 9 | 09 66 164 771 . | 09 66 164 671 . |
| | 15 | 09 66 264 771 . | 09 66 264 671 . |
| | 25 | 09 66 364 771 . | 09 66 364 671 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 5 | | | |
| 4-40 UNC ▶ 6 | | | |
| fitted screw locks 4-40 UNC ▶ 7[1)] | | | |
| **Female connector** | | | |
| Flange height x = 5.7 mm | | | |
| metal shell | 9 | 09 66 154 751 . | 09 66 154 651 . |
| | 15 | 09 66 254 751 . | 09 66 254 651 . |
| | 25 | 09 66 354 751 . | 09 66 354 651 . |
| | 37 | 09 66 454 751 . | 09 66 454 651 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 5 | | | |
| 4-40 UNC ▶ 6 | | | |
| fitted screw locks 4-40 UNC ▶ 7[1)] | | | |
| **Female connector** | | | |
| Flange height x = 6 mm | | | |
| metal shell | 9 | 09 66 154 751 . | 09 66 154 651 . |
| | 15 | 09 66 254 751 . | 09 66 254 651 . |
| | 25 | 09 66 354 751 . | 09 66 354 651 . |
| | 37 | 09 66 454 751 . | 09 66 454 651 . |
| | 50 | 09 66 554 751 . | 09 66 554 651 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 1 | | | |
| 4-40 UNC ▶ 2 | | | |
| fitted screw locks 4-40 UNC ▶ 3[1)] | | | |

[1)] Fitted screw locks 4-40 UNC not normally kept in stock for performance level 3

Connector dimensions see page 05.173. Mating conditions see page 05.171.



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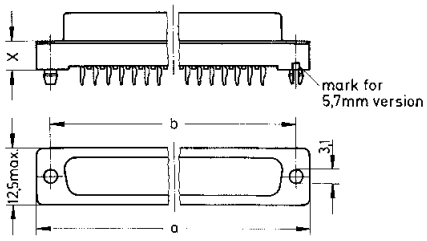
Number of contacts

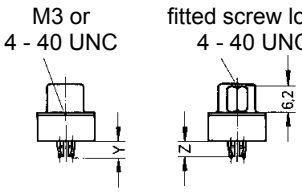
# 9–50

## Press-in, straight with grounding press-in board locks

| Identification | Drawing | Dimensions in mm |
|---|---|---|

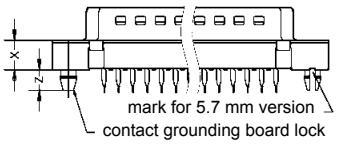
### Male connector
9 – 25 contacts

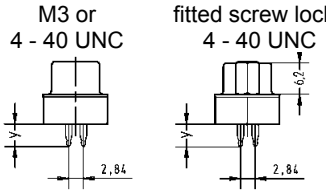


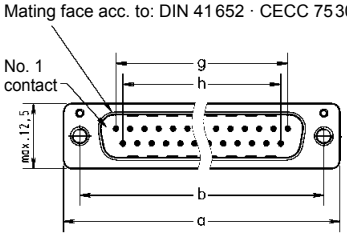

| X | Y | Z |
|---|---|---|
| 6.0 ± 0.2 | 4.20 ± 0.2 | 3.5 max. |
| 5.7 ± 0.2 | 4.35 ± 0.2 | 3.9 max. |

### Female connector
9 – 37 contacts



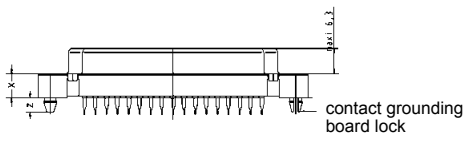



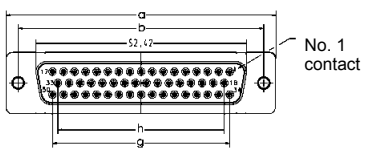

Mating face acc. to: DIN 41 652 · CECC 75 301-802 · IEC 60 807

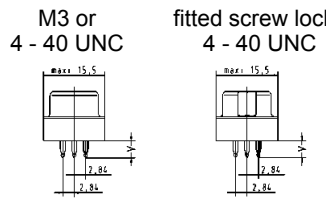



| | a | b | g | h |
|---|---|---|---|---|
| 9 | 31.00 | 24.90 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 |
| 15 | 39.30 | 33.20 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 |
| 25 | 53.10 | 47.00 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 |
| 37 | 69.65 | 63.55 | 18 x 2.76 = 49.68 | 17 x 2.76 = 46.92 |
| 50 | 67.00 | 61.10 | 16 x 2.76 = 44.16 | 15 x 2.76 = 41.40 |

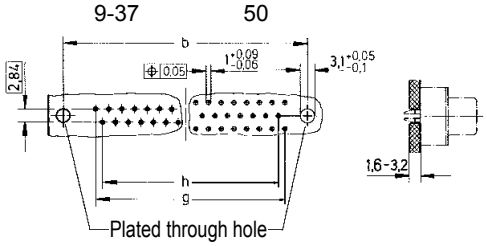
### Female connector
50 contacts




### Board drillings





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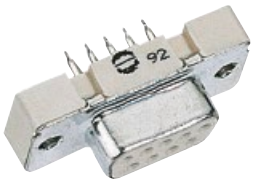
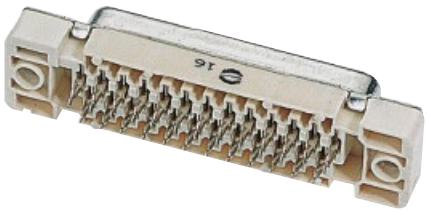
Number of contacts

# 9–50





## Press-in, straight without grounding press-in board locks



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.171<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector** | | | |
| Flange height x = 5.7 mm | | | |
| metal shell with dimples | 9 | 09 66 124 770 . | 09 66 124 670 . |
| | 15 | 09 66 224 770 . | 09 66 224 670 . |
| | 25 | 09 66 324 770 . | 09 66 324 670 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| ø 3.1 mm hole ▶ 4[1] | | | |
| M3 ▶ 5 | | | |
| 4-40 UNC ▶ 6 | | | |
| fitted screw locks 4-40 UNC ▶ 7[2] | | | |
| **Female connector** | | | |
| Flange height x = 5.7 mm | | | |
| metal shell | 9 | 09 66 114 750 . | 09 66 114 650 . |
| | 15 | 09 66 214 750 . | 09 66 214 650 . |
| | 25 | 09 66 314 750 . | 09 66 314 650 . |
| | 37 | 09 66 414 750 . | 09 66 414 650 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| ø 3.1 mm hole ▶ 4[1] | | | |
| M3 ▶ 5 | | | |
| 4-40 UNC ▶ 6 | | | |
| fitted screw locks 4-40 UNC ▶ 7[2] | | | |
| **Female connector** | | | |
| Flange height x = 6 mm | | | |
| metal shell | 9 | 09 66 114 750 . | 09 66 114 650 . |
| | 15 | 09 66 214 750 . | 09 66 214 650 . |
| | 25 | 09 66 314 750 . | 09 66 314 650 . |
| | 37 | 09 66 414 750 . | 09 66 414 650 . |
| | 50 | 09 66 514 750 . | 09 66 514 650 . |
| Please insert digit for flange thread or fitted female screw locks | | | |
| ø 3.1 mm hole ▶ 0[1] | | | |
| M3 ▶ 1 | | | |
| 4-40 UNC ▶ 2 | | | |
| fitted screw locks 4-40 UNC ▶ 3[2] | | | |

[1] Not normally kept in stock
[2] Fitted screw locks 4-40 UNC not normally kept in stock for performance level 3
Connector dimensions see page 05.175. Mating conditions see page 05.171.



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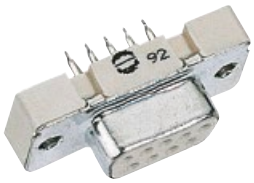
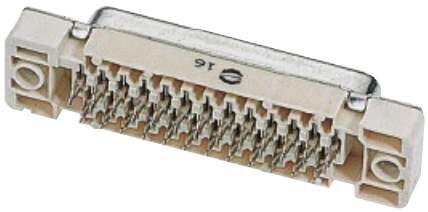
Number of contacts

# 9–50

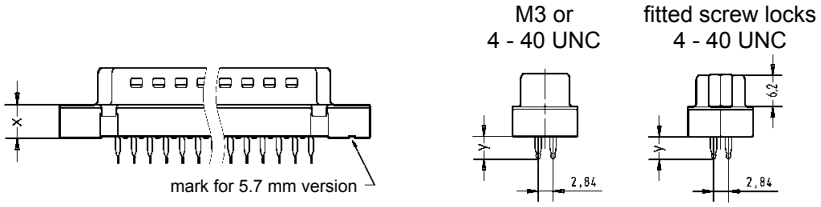




## Press-in, straight without grounding press-in board locks

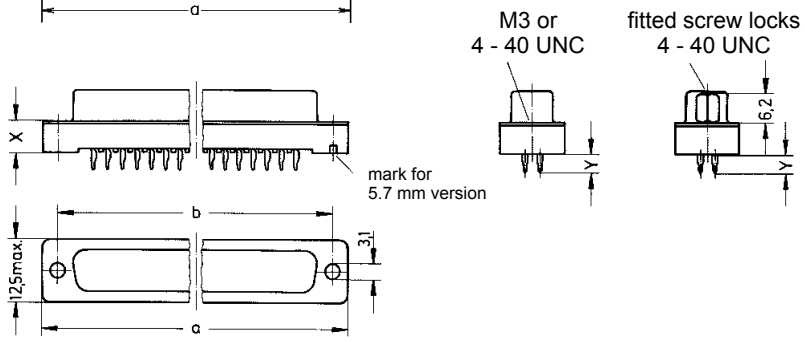
| Identification | Drawing | Dimensions in mm |
|---|---|---|

### Male connector
9 – 25 contacts

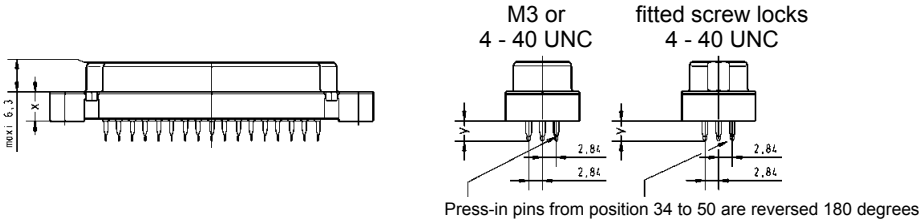


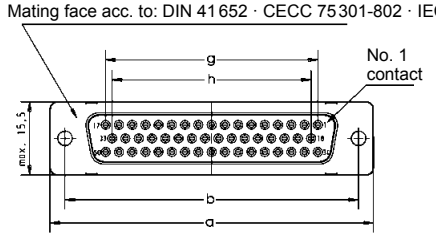

| X | Y |
|---|---|
| 6.0 ± 0.2 | 4.20 ± 0.2 |
| 5.7 ± 0.2 | 4.35 ± 0.2 |

### Female connector
9 – 37 contacts



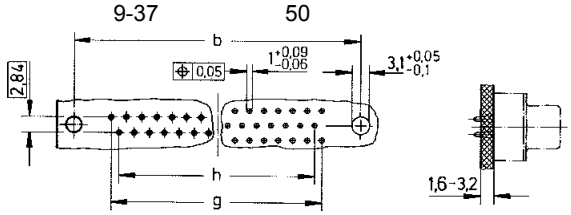

### Female connector
50 contacts




| | a | b | g | h |
|---|---|---|---|---|
| 9 | 31.00 | 24.90 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 |
| 15 | 39.30 | 33.20 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 |
| 25 | 53.10 | 47.00 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 |
| 37 | 69.65 | 63.55 | 18 x 2.76 = 49.68 | 17 x 2.76 = 46.92 |
| 50 | 67.00 | 61.10 | 16 x 2.76 = 44.16 | 15 x 2.76 = 41.40 |

### Board drillings





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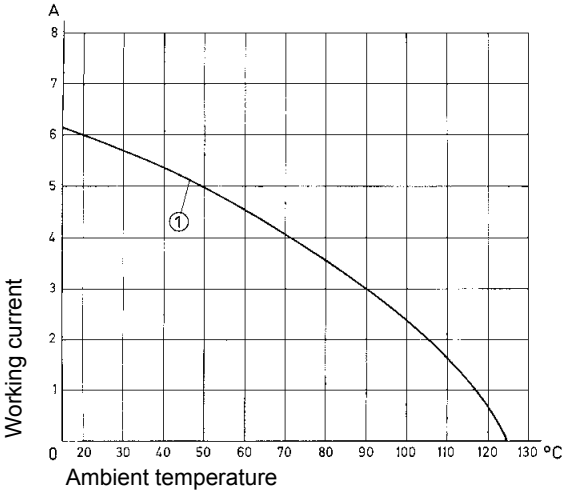
| | |
|---|---|
| **Number of contacts** | 9, 15, 25, 37<br>UL recognized |
| **Working current**<br>see current carrying capacity chart<br>Stamped contacts | <br><br>6.5 A max. |
| **Test voltage $U_{r.m.s.}$** | 1 kV |
| **Clearance and creepage** | ≥ 1.0 mm |
| **Contact resistance**<br>**Insulation resistance** | ≤ 10 mΩ<br>≥ $10^{10}$ Ω |
| **Temperature range**<br>during reflow soldering<br>The higher temperature limit includes the local ambient and heating effect of the contacts under load. All connectors are suitable for standard reflow processes. | -55 °C … +125 °C<br>max. + 240 °C for 15 s |
| **Terminations** | a) Solder pins Ø 0.6 mm for P.C.B. holes Ø 0.8/1 mm<br>b) Solder pins, angled 90° Ø 0.6 mm for P.C.B. holes Ø 1 mm |
| **Materials**<br>Mouldings<br>Contacts | <br>Thermoplastic resin, glass-fibre filled (PCT), UL 94-V0<br>Copper alloy |
| **Contact surface**<br>Contact zone<br>Metal shell | <br>selectively gold-plated according to performance level[1)]<br>Plated steel |
| **Insertion and withdrawal force**<br>Connector on P.C.B.<br>Solder, straight with clips<br>– insertion max. per connector:<br>– withdrawal min. per connector: | <br><br><br>60 N<br>10 N |
| **Mating force**<br>9 way<br>15 way<br>25 way<br>37 way | <br>≤ 30 N<br>≤ 50 N<br>≤ 83 N<br>≤ 123 N |

## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.

The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

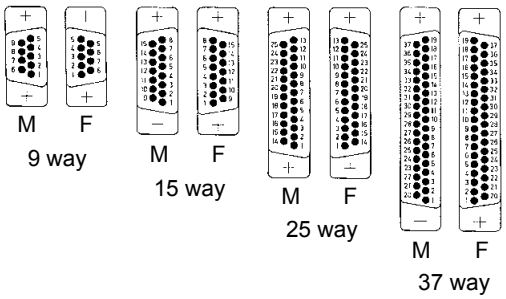
Control and test procedures according to DIN IEC 60 512.




Example: 25 way connector

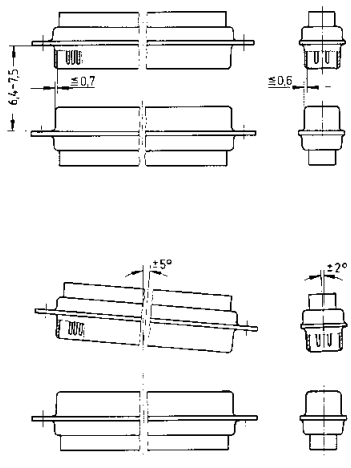
① Stamped contacts

## Contact arrangement View from termination side




M = Male connector
F = Female connector

## Mating conditions as per DIN 41 652




[1)] Performance level 3, 50 mating cycles, no gas test
Performance level 2 as per CECC 75 301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60 512
Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512



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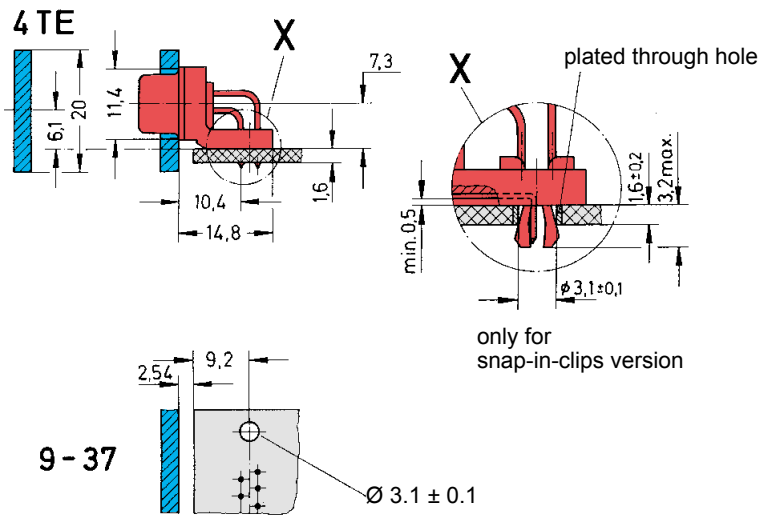
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Standard Versions

Mounting height 7.3 mm

9-37 way
for front panel
4 units of width (TE)





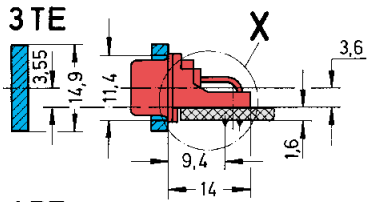


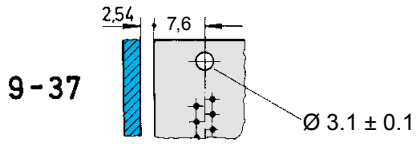
for connectors see pages 05.180 – 05.181

## Low-Profile Versions

Mounting height 3.6 mm

9-37 way
for front panel
3 units of width (TE)

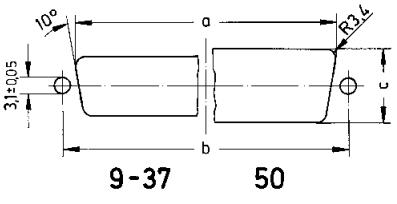



for connectors see pages 05.182 – 05.183

## Panel cut out for front/rear mount

Values are taken from the CECC 75301-802




Front mount

| | $a_{\pm 0.2}$ | $b_{\pm 0.13}$ | $c_{\pm 0.2}$ |
|---|---|---|---|
| 9 | 22.2 | 25.0 | 12.3 |
| 15 | 30.5 | 33.3 | 12.3 |
| 25 | 44.3 | 47.0 | 12.3 |
| 37 | 60.7 | 63.5 | 12.3 |
| 50 | 58.3 | 61.1 | 15.1 |

Rear mount

| | $a_{\pm 0.2}$ | $b_{\pm 0.13}$ | $c_{\pm 0.2}$ |
|---|---|---|---|
| 9 | 20.5 | 25.0 | 11.4 |
| 15 | 28.8 | 33.3 | 11.4 |
| 25 | 42.5 | 47.0 | 11.4 |
| 37 | 59.1 | 63.5 | 11.4 |
| 50 | 56.3 | 61.1 | 14.1 |



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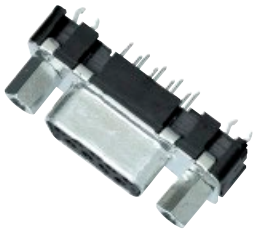
Number of contacts

# 9–37



## SMC stamped solder pins, straight with/without grounding board locks



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶ Explanations see page 05.176<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector**<br>metal shell with dimples | | | |
| Without grounding board locks | 9 | 09 65 129 770 . | 09 65 129 670 . |
| | 15 | 09 65 229 770 . | 09 65 229 670 . |
| | 25 | 09 65 329 770 . | 09 65 329 670 . |
| | 37 | 09 65 429 770 . | 09 65 429 670 . |
| With grounding board locks | 9 | 09 65 169 771 . | 09 65 169 671 . |
| | 15 | 09 65 269 771 . | 09 65 269 671 . |
| | 25 | 09 65 369 771 . | 09 65 369 671 . |
| | 37 | 09 65 469 771 . | 09 65 469 671 . |
| **Female connector**<br>metal shell | | | |
| Without grounding board locks | 9 | 09 66 115 750 . | 09 66 115 650 . |
| | 15 | 09 66 215 750 . | 09 66 215 650 . |
| | 25 | 09 66 315 750 . | 09 66 315 650 . |
| | 37 | 09 66 415 750 . | 09 66 415 650 . |
| With grounding board locks | 9 | 09 66 155 751 . | 09 66 155 651 . |
| | 15 | 09 66 255 751 . | 09 66 255 651 . |
| | 25 | 09 66 355 751 . | 09 66 355 651 . |
| | 37 | 09 66 455 751 . | 09 66 455 651 . |
| Please insert digit for flange thread or fitted female screw locks<br>M3 ▶ 1<br>4-40 UNC ▶ 2<br>fitted screw locks 4-40 UNC ▶ 3[1)] | | | |

[1)] Fitted screw locks 4-40 UNC not normally kept in stock for performance level 3

Connector dimensions see page 05.179. Mating conditions see page 05.176.



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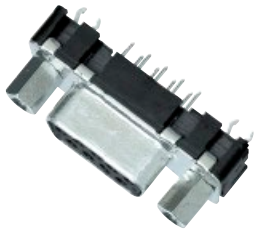
Number of contacts

# 9–37

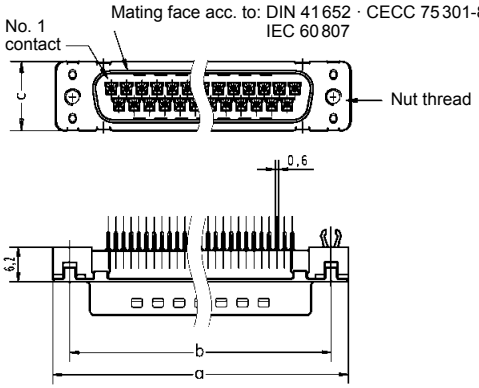


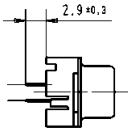
SMC stamped solder pins, straight with/without grounding board locks

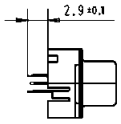


| Identification | Drawing | Dimensions in mm |
|---|---|---|

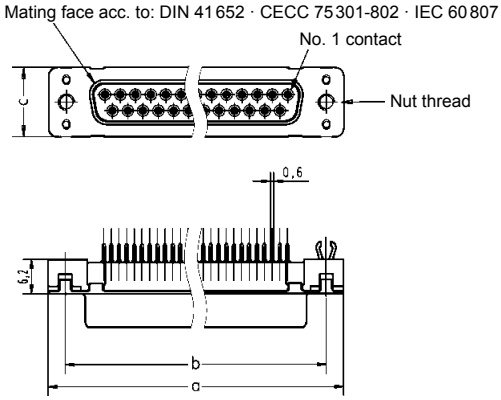
## Male connector

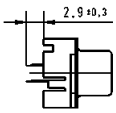


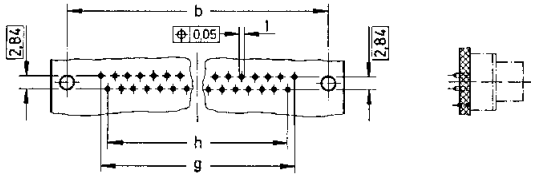

## Female connector




| | a | $b_{\pm 0.1}$ | c | g | h |
|---|---|---|---|---|---|
| 9 | 30.9 | 25.0 | 12.5 | 4 x 2.74 = 10.96 | 3 x 2.74 = 8.22 |
| 15 | 39.2 | 33.3 | 12.5 | 7 x 2.74 = 19.18 | 6 x 2.74 = 16.44 |
| 25 | 53.1 | 47.0 | 12.5 | 12 x 2.76 = 33.12 | 11 x 2.76 = 30.36 |
| 37 | 69.4 | 63.5 | 12.5 | 18 x 2.76 = 49.68 | 17 x 2.76 = 46.92 |

## Board drillings



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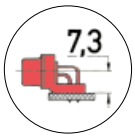
Standard Versions

Number of contacts

# 9–37

Mounting height



SMC stamped solder pins, angled with grounding board locks

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | Performance level 3 | Performance level 2 |
| **Performance levels** ▶ Explanations see page 05.176 Other performance levels on request | | | |
| **Male connector** metal shell with dimples | | | |
| | | 2.84 mm pitch | 2.84 mm pitch |
| | 9 | 09 65 167 781 . [1] | 09 65 167 681 . [1] |
| | 15 | 09 65 267 781 . [1] | 09 65 267 681 . [1] |
| | 25 | 09 65 367 781 . [1] | 09 65 367 681 . [1] |
| | 37 | 09 65 467 781 . [1] | 09 65 467 681 . [1] |
| | | 2.54 mm pitch | 2.54 mm pitch |
| | 9 | 09 65 166 781 . | 09 65 166 681 . |
| | 15 | 09 65 266 781 . | 09 65 266 681 . |
| | 25 | 09 65 366 781 . | 09 65 366 681 . |
| | 37 | 09 65 466 781 . | 09 65 466 681 . |
| **Female connector** metal shell | | | |
| | | 2.84 mm pitch | 2.84 mm pitch |
| | 9 | 09 66 157 761 . [1] | 09 66 157 661 . [1] |
| | 15 | 09 66 257 761 . [1] | 09 66 257 661 . [1] |
| | 25 | 09 66 357 761 . [1] | 09 66 357 661 . [1] |
| | 37 | 09 66 457 761 . [1] | 09 66 457 661 . [1] |
| | | 2.54 mm pitch | 2.54 mm pitch |
| | 9 | 09 66 156 761 . | 09 66 156 661 . |
| | 15 | 09 66 256 761 . | 09 66 256 661 . |
| | 25 | 09 66 356 761 . | 09 66 356 661 . |
| | 37 | 09 66 456 761 . | 09 66 456 661 . |

Please insert digit for flange thread or fitted female screw locks

| | |
|---|---|
| Ø 3.1 mm hole ▶ | 0[1] |
| M3 ▶ | 1 |
| 4-40 UNC ▶ | 2 |
| fitted screw locks 4-40 UNC ▶ | 3 |

[1] Not normally kept in stock



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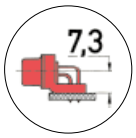
Standard Versions

Number of contacts

# 9–37

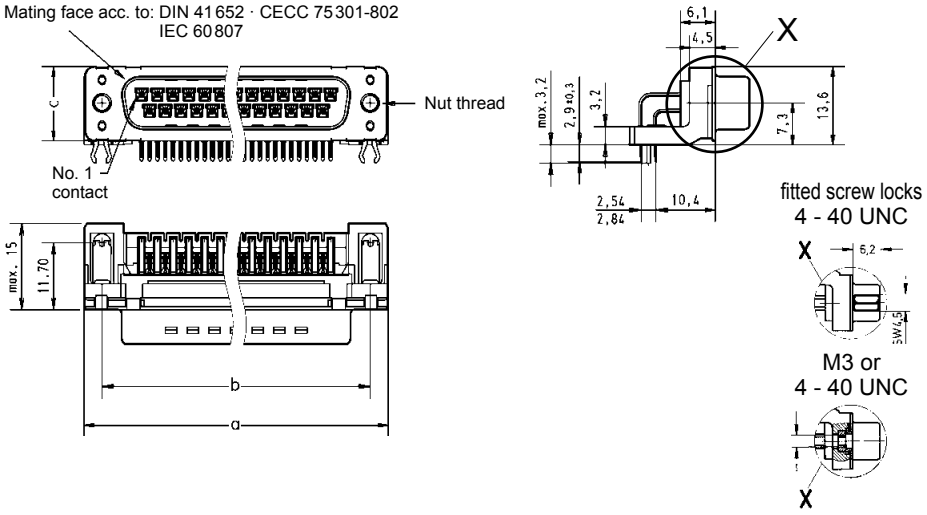
Mounting height



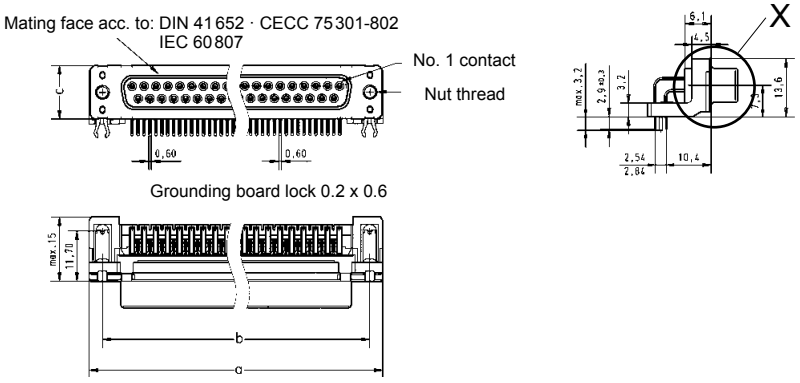
SMC stamped solder pins, angled with grounding board locks

| Identification | Drawing | Dimensions in mm |
|---|---|---|

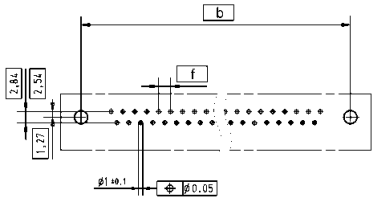
## Male connector




## Female connector




## Board drillings




| | a | $b_{\pm 0.1}$ | c | f |
|---|---|---|---|---|
| 9 | 30.90 | 25.00 | 12.50 | 2.74 |
| 15 | 39.20 | 33.30 | 12.50 | 2.74 |
| 25 | 53.10 | 47.00 | 12.50 | 2.76 |
| 37 | 69.40 | 63.50 | 12.50 | 2.76 |

Mating conditions see page 05.176
Mounting details see page 05.177



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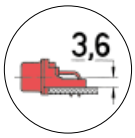
Low-Profile Versions

Number of contacts

# 9–37

Mounting height



SMC stamped solder pins, angled with grounding board locks



| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | Performance level 3 | Performance level 2 |
| **Performance levels** ▶<br>Explanations see page 05.176<br>Other contact surfaces on request | | | |
| **Male connector**<br>metal shell with dimples | 9 | 09 65 166 781 . | 09 65 166 681 . |
| | 15 | 09 65 266 781 . | 09 65 266 681 . |
| | 25 | 09 65 366 781 . | 09 65 366 681 . |
| | 37 | 09 65 466 781 . | 09 65 466 681 . |
| **Female connector**<br>metal shell | 9 | 09 66 156 761 . | 09 66 156 661 . |
| | 15 | 09 66 256 761 . | 09 66 256 661 . |
| | 25 | 09 66 356 761 . | 09 66 356 661 . |
| | 37 | 09 66 456 761 . | 09 66 456 661 . |
| Please insert digit for flange thread or fitted female screw locks<br>M3 ▶ 5<br>4-40 UNC ▶ 6<br>fitted screw locks 4-40 UNC ▶ 7 | | | |



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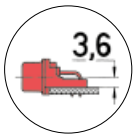
Low-Profile Versions

Number of contacts

# 9–37

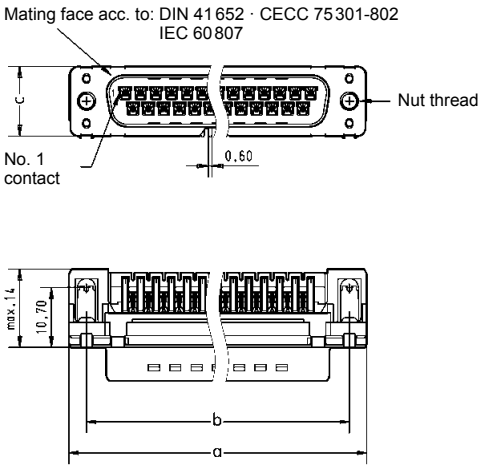
Mounting height

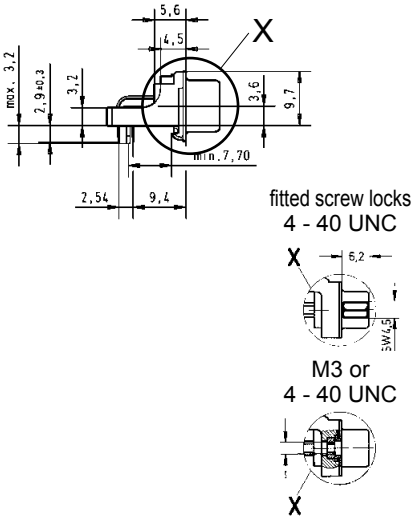


SMC stamped solder pins, angled with grounding board locks

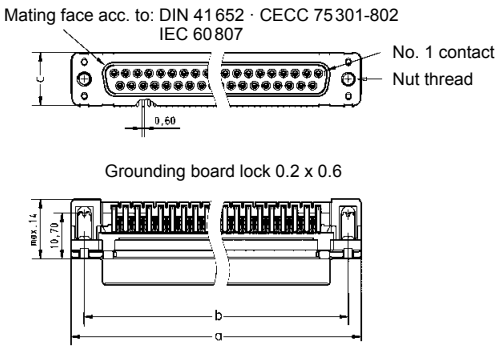
| Identification | Drawing | Dimensions in mm |
|---|---|---|

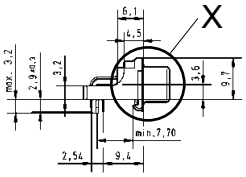
## Male connector



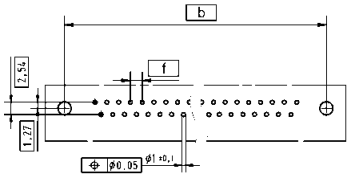




## Female connector




## Board drillings




| | a | $b_{\pm 0.1}$ | c | f |
|---|---|---|---|---|
| 9 | 30.90 | 25.00 | 12.50 | 2.74 |
| 15 | 39.20 | 33.30 | 12.50 | 2.74 |
| 25 | 53.10 | 47.00 | 12.50 | 2.76 |
| 37 | 69.40 | 63.50 | 12.50 | 2.76 |

Mating conditions see page 05.176
Mounting details see page 05.177



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| | |
|---|---|
| Number of contacts | 9, 15, 25, 37<br>UL recognized |
| Working current | 5 A |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Clearance and creepage | ≥ 1.0 mm |
| Contact resistance<br>Insulation resistance | < 25 mΩ<br>> 5 GΩ |
| Temperature range | as per profile JEDEC 020 D |
| Terminations | Solder pins for P.C.B. pads |

**Materials**

| | |
|---|---|
| Mouldings | LCP black<br>UL 94-V0 |
| Contacts | Phosphorus bronze |
| Grounding die | Zamac |
| Shell | Steel |

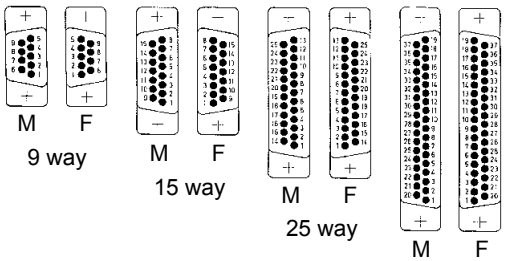
**Contact surface**

| | |
|---|---|
| Contact zone | selectively plated<br>acc. to performance level[1)] |
| Grounding die | Pure tin |
| Shell | Nickel plated |

**Mating force**

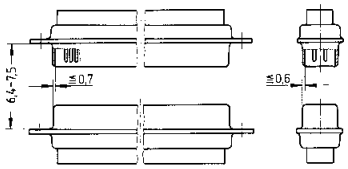
| | |
|---|---|
| 9 way | ≤ 30 N |
| 15 way | ≤ 50 N |
| 25 way | ≤ 83 N |
| 37 way | ≤ 123 N |

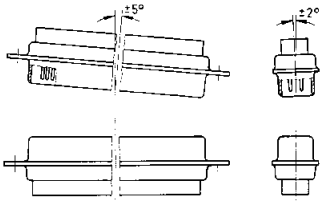
## Contact arrangement View from termination side




M = Male connector
F = Female connector

## Mating conditions as per DIN 41652




[1)] Performance level 3, 50 mating cycles, no gas test
Performance level 2 as per CECC 75301-802, 250 mating cycles, 4 days 4 mixed gas test – IEC 60512



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# Notes





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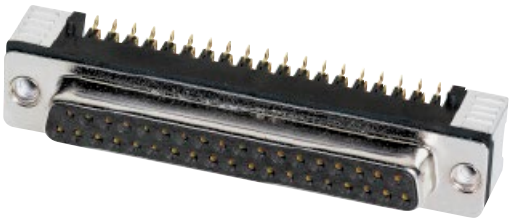
Standard Versions

Number of contacts

# 9–37



## SMT stamped solder pins, angled with grounding dies

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.184<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector**<br>metal shell with dimples | 9 | 09 55 166 78 . . 741 | 09 55 166 68 . . 741 |
| | 15 | 09 55 266 78 . . 741 | 09 55 266 68 . . 741 |
| | 25 | 09 55 366 78 . . 741 | 09 55 366 68 . . 741 |
| | 37 | 09 55 466 78 . . 741 | 09 55 466 68 . . 741 |
| **Female connector**<br>metal shell | 9 | 09 55 156 76 . . 741 | 09 55 156 66 . . 741 |
| | 15 | 09 55 256 76 . . 741 | 09 55 256 66 . . 741 |
| | 25 | 09 55 356 76 . . 741 | 09 55 356 66 . . 741 |
| | 37 | 09 55 456 76 . . 741 | 09 55 456 66 . . 741 |
| **Packaging: 140 pieces on a reel** | | | |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 11 | | | |
| 4-40 UNC ▶ 12 | | | |
| non-removable fitted screw locks M3 ▶ 21 | | | |
| non-removable fitted screw locks 4-40 UNC ▶ 22 | | | |
| **Samples** | | | |
| **Male connector**<br>metal shell with dimples | 9 | If performance level 3 is required please order as substitute performance level 2 | 09 55 166 68 . . 333 |
| | 15 | | 09 55 266 68 . . 333 |
| | 25 | | 09 55 366 68 . . 333 |
| | 37 | | 09 55 466 68 . . 333 |
| **Female connector**<br>metal shell | 9 | | 09 55 156 66 . . 333 |
| | 15 | | 09 55 256 66 . . 333 |
| | 25 | | 09 55 356 66 . . 333 |
| | 37 | | 09 55 456 66 . . 333 |
| **Packaging**<br>**9, 15 contacts: 5 samples**<br>**25, 37 contacts: 3 samples** | | | |
| Please insert digit for flange thread or fitted female screw locks | | | |
| 4-40 UNC ▶ 12 | | | |
| non-removable fitted screw locks 4-40 UNC ▶ 22 | | | |

Connector dimensions see page 05.187. Mating conditions see page 05.184.



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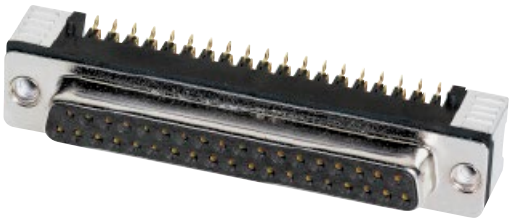
Standard Versions

Number of contacts

# 9–37

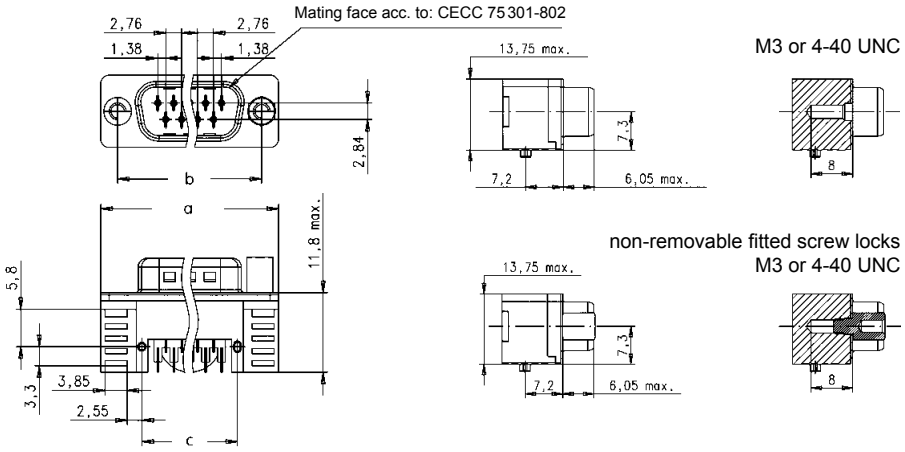


SMT stamped solder pins, angled with grounding dies

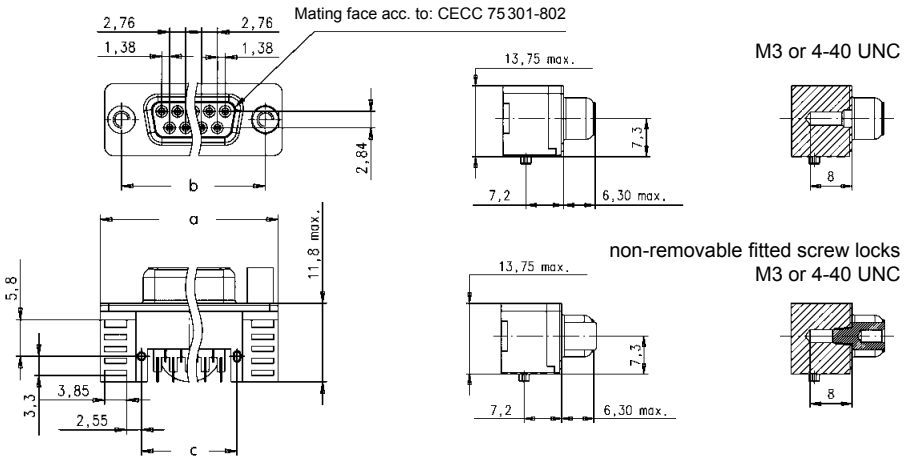
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

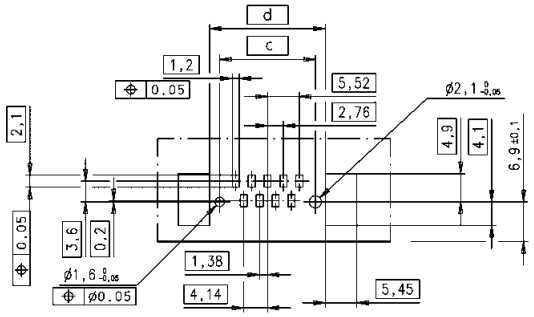
M3 or 4-40 UNC  non-removable fitted screw locks M3 or 4-40 UNC




## Female connector



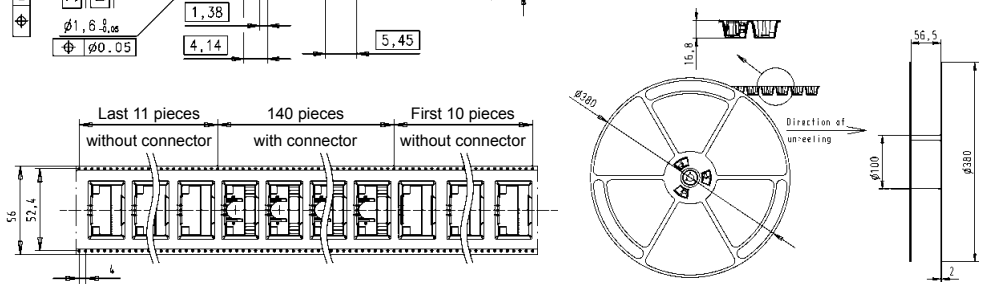

## pcb layout




| | a | b | c | d |
|---|---|---|---|---|
| 9 | 31.10 | 24.99 | 16.60 | 20.1 |
| 15 | 39.52 | 33.32 | 24.90 | 28.4 |
| 25 | 53.29 | 47.04 | 38.64 | 42.1 |
| 37 | 69.60 | 63.50 | 55.10 | 58.6 |

## Packaging

(1 reel = 140 pieces)
Reel diameter = 380 mm



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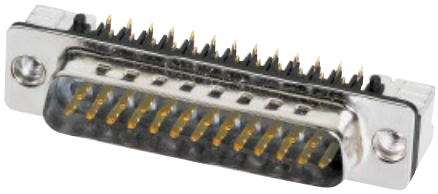
Low-Profile Versions

Number of contacts

# 9–37



## SMT stamped solder pins, angled with grounding dies

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶<br>Explanations see page 05.184<br>Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector**<br>metal shell with dimples | 9 | 09 55 166 78 . . 741 | 09 55 166 68 . . 741 |
| | 15 | 09 55 266 78 . . 741 | 09 55 266 68 . . 741 |
| | 25 | 09 55 366 78 . . 741 | 09 55 366 68 . . 741 |
| | 37 | 09 55 466 78 . . 741 | 09 55 466 68 . . 741 |
| **Female connector**<br>metal shell | 9 | 09 55 156 76 . . 741 | 09 55 156 66 . . 741 |
| | 15 | 09 55 256 76 . . 741 | 09 55 256 66 . . 741 |
| | 25 | 09 55 356 76 . . 741 | 09 55 356 66 . . 741 |
| | 37 | 09 55 456 76 . . 741 | 09 55 456 66 . . 741 |
| **Packaging: 160 pieces on a reel** | | | |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 15 | | | |
| 4-40 UNC ▶ 16 | | | |
| non-removable fitted screw locks M3 ▶ 19 | | | |
| non-removable fitted screw locks 4-40 UNC ▶ 20 | | | |

## Samples

| | | | |
|---|---|---|---|
| **Male connector**<br>metal shell with dimples | 9 | If performance level 3 is required please order as substitute performance level 2 | 09 55 166 68 . . 333 |
| | 15 | | 09 55 266 68 . . 333 |
| | 25 | | 09 55 366 68 . . 333 |
| | 37 | | 09 55 466 68 . . 333 |
| **Female connector**<br>metal shell | 9 | | 09 55 156 66 . . 333 |
| | 15 | | 09 55 256 66 . . 333 |
| | 25 | | 09 55 356 66 . . 333 |
| | 37 | | 09 55 456 66 . . 333 |
| **Packaging**<br>**9, 15 contacts: 5 samples**<br>**25, 37 contacts: 3 samples** | | | |
| Please insert digit for flange thread or fitted female screw locks | | | |
| 4-40 UNC ▶ 16 | | | |
| non-removable fitted screw locks 4-40 UNC ▶ 20 | | | |



Connector dimensions see page 05.189. Mating conditions see page 05.184.

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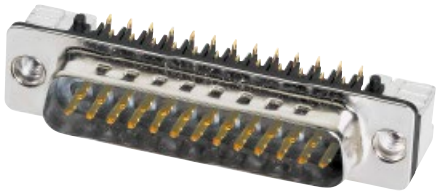
Low-Profile Versions

Number of contacts

# 9–37

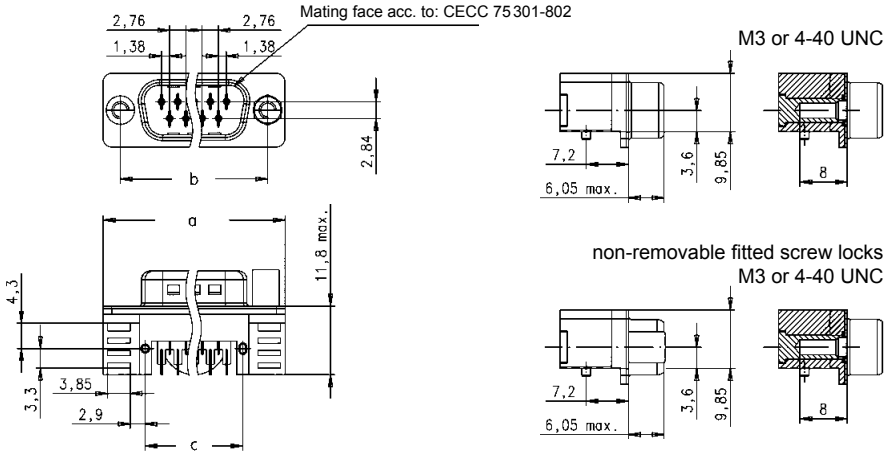


SMT stamped solder pins, angled with grounding dies

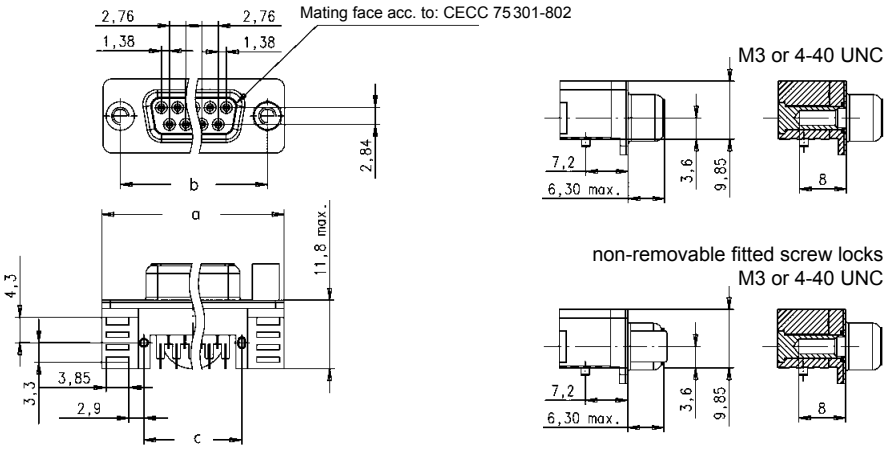
| Identification | Drawing | Dimensions in mm |
|---|---|---|

Male connector

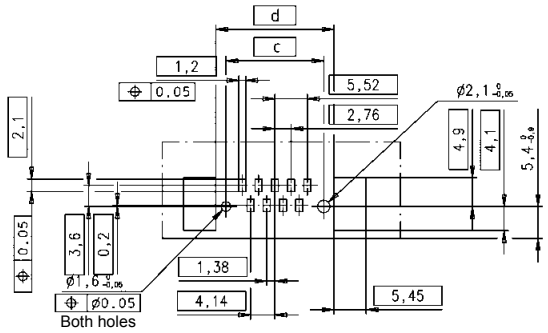
M3 or 4-40 UNC  non-removable fitted screw locks M3 or 4-40 UNC




Female connector



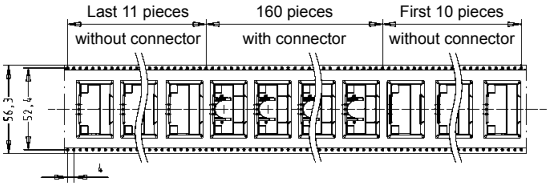

pcb layout




| | a | b | c | d |
|---|---|---|---|---|
| 9 | 31.10 | 24.99 | 16.60 | 20.1 |
| 15 | 39.52 | 33.32 | 24.90 | 28.4 |
| 25 | 53.29 | 47.04 | 38.64 | 42.1 |
| 37 | 69.60 | 63.50 | 55.10 | 58.6 |

Packaging

(1 reel = 160 pieces)
Reel diameter = 330 mm



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Number of contacts

# 9–37

## SMT stamped solder pins, straight without grounding pins

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| **Performance levels** ▶ Explanations see page 05.184 Other performance levels on request | | Performance level 3 | Performance level 2 |
| **Male connector** metal shell with dimples | 9 | 09 55 129 78 . . 741 | 09 55 129 68 . . 741 |
| | 15 | 09 55 229 78 . . 741 | 09 55 229 68 . . 741 |
| | 25 | 09 55 329 78 . . 741 | 09 55 329 68 . . 741 |
| | 37 | 09 55 429 78 . . 741 | 09 55 429 68 . . 741 |
| **Female connector** metal shell | 9 | 09 55 115 76 . . 741 | 09 55 115 66 . . 741 |
| | 15 | 09 55 215 76 . . 741 | 09 55 215 66 . . 741 |
| | 25 | 09 55 315 76 . . 741 | 09 55 315 66 . . 741 |
| | 37 | 09 55 415 76 . . 741 | 09 55 415 66 . . 741 |
| **Packaging: 140 pieces on a reel** | | | |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 11 | | | |
| 4-40 UNC ▶ 12 | | | |
| fixed screw locks M3 ▶ 21 | | | |
| fixed screw locks 4-40 UNC ▶ 22 | | | |
| **Samples** | | | |
| **Male connector** metal shell with dimples | 9 | If performance level 3 is required please order as substitute performance level 2 | 09 55 129 68 . . 333 |
| | 15 | | 09 55 229 68 . . 333 |
| | 25 | | 09 55 329 68 . . 333 |
| | 37 | | 09 55 429 68 . . 333 |
| **Female connector** metal shell | 9 | | 09 55 115 66 . . 333 |
| | 15 | | 09 55 215 66 . . 333 |
| | 25 | | 09 55 315 66 . . 333 |
| | 37 | | 09 55 415 66 . . 333 |
| **Packaging 9, 15 contacts: 5 samples 25, 37 contacts: 3 samples** | | | |
| Please insert digit for flange thread or fitted female screw locks | | | |
| 4-40 UNC ▶ 12 | | | |
| fixed screw locks 4-40 UNC ▶ 22 | | | |

Connector dimensions see page 05.191. Mating conditions see page 05.184.



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Number of contacts

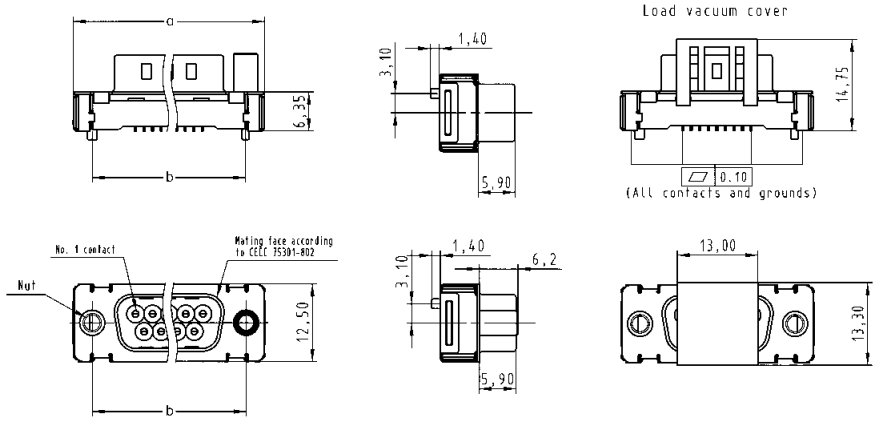
# 9–37

SMT stamped solder pins, straight without grounding pins

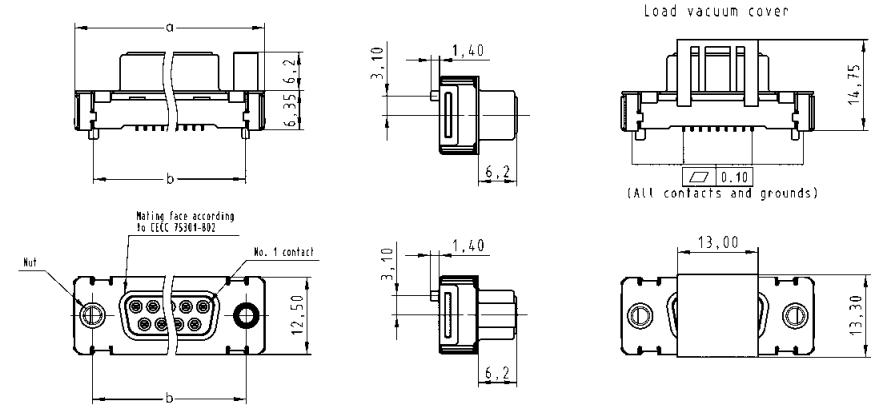
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

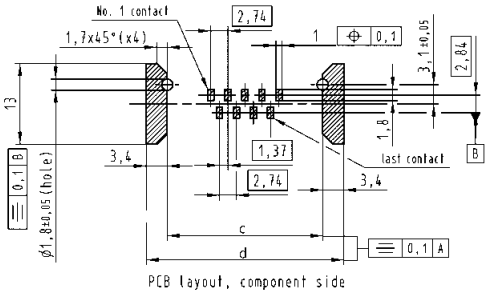
M3 or 4-40 UNC  non-removable fitted screw
locks M3 or 4-40 UNC




## Female connector




## pcb layout

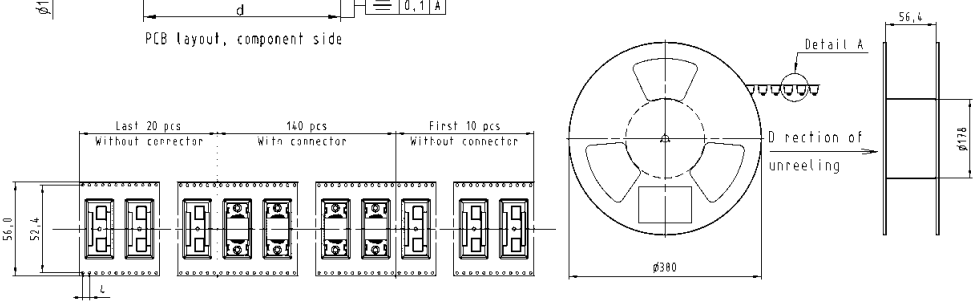



PCB layout, component side

| | a | b | c | d |
|---|---|---|---|---|
| 9 | 31.12 | 25.00 | 25.0 | 31.8 |
| 15 | 39.45 | 33.33 | 33.3 | 40.1 |
| 25 | 53.35 | 47.04 | 47.0 | 53.8 |
| 37 | 69.62 | 63.50 | 63.5 | 70.3 |

## Packaging

(1 reel = 140 pieces)
Reel diameter = 380 mm



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Number of contacts

# 9–37

## SMT stamped solder pins, straight with grounding pins

| Identification | No. of contacts | Part number | |
|---|---|---|---|
| | | Performance level 3 | Performance level 2 |
| **Performance levels** ▶ Explanations see page 05.184 Other performance levels on request | | | |
| **Male connector** metal shell with dimples | 9 | 09 55 169 78 . . 741 | 09 55 169 68 . . 741 |
| | 15 | 09 55 269 78 . . 741 | 09 55 269 68 . . 741 |
| | 25 | 09 55 369 78 . . 741 | 09 55 369 68 . . 741 |
| | 37 | 09 55 469 78 . . 741 | 09 55 469 68 . . 741 |
| **Female connector** metal shell | 9 | 09 55 155 76 . . 741 | 09 55 155 66 . . 741 |
| | 15 | 09 55 255 76 . . 741 | 09 55 255 66 . . 741 |
| | 25 | 09 55 355 76 . . 741 | 09 55 355 66 . . 741 |
| | 37 | 09 55 455 76 . . 741 | 09 55 455 66 . . 741 |
| **Packaging: 140 pieces on a reel** | | | |
| Please insert digit for flange thread or fitted female screw locks | | | |
| M3 ▶ 11 | | | |
| 4-40 UNC ▶ 12 | | | |
| fixed screw locks M3 ▶ 21 | | | |
| fixed screw locks 4-40 UNC ▶ 22 | | | |
| **Samples** | | | |
| **Male connector** metal shell with dimples | 9 | If performance level 3 is required please order as substitute performance level 2 | 09 55 169 68 . . 333 |
| **Female connector** metal shell | 9 | | 09 55 155 66 . . 333 |
| **Packaging** **9, 15 contacts: 5 samples** **25, 37 contacts: 3 samples** | | | |
| Please insert digit for flange thread or fitted female screw locks | | | |
| 4-40 UNC ▶ 12 | | | |
| fixed screw locks 4-40 UNC ▶ 22 | | | |

Connector dimensions see page 05.193. Mating conditions see page 05.184.



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Number of contacts

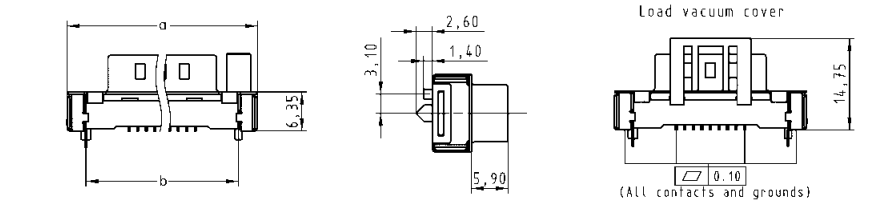
# 9–37

SMT stamped solder pins, straight with grounding pins

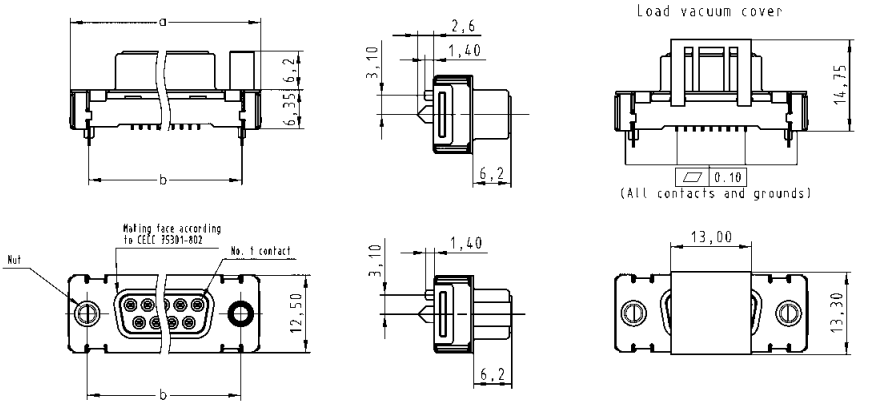
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Male connector

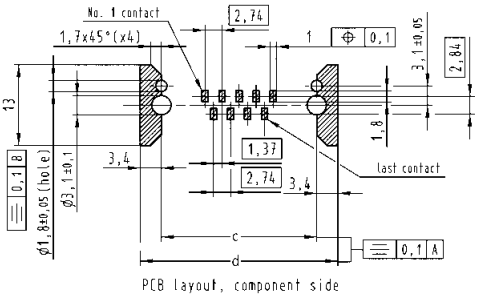
M3 or 4-40 UNC  non-removable fitted screw
locks M3 or 4-40 UNC




## Female connector



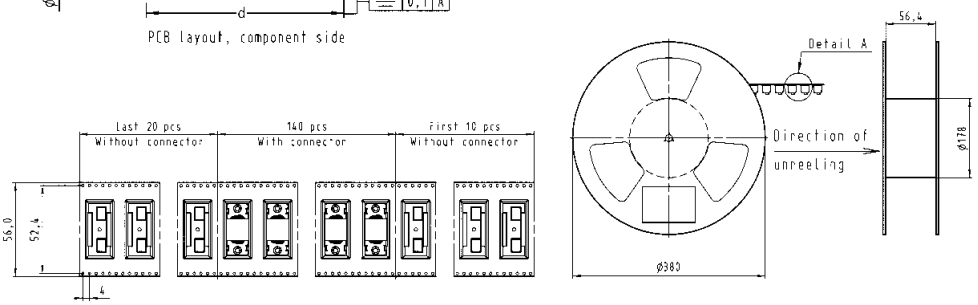

## pcb layout




| | a | b | c | d |
|---|---|---|---|---|
| 9 | 31.12 | 25.00 | 25.0 | 31.8 |
| 15 | 39.45 | 33.33 | 33.3 | 40.1 |
| 25 | 53.35 | 47.04 | 47.0 | 53.8 |
| 37 | 69.62 | 63.50 | 63.5 | 70.3 |

## Packaging

(1 reel = 140 pieces)
Reel diameter = 380 mm



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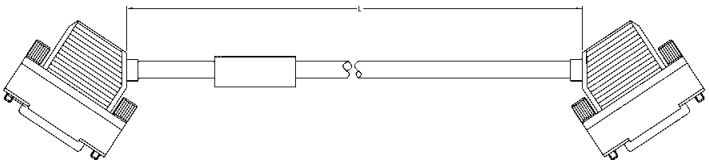
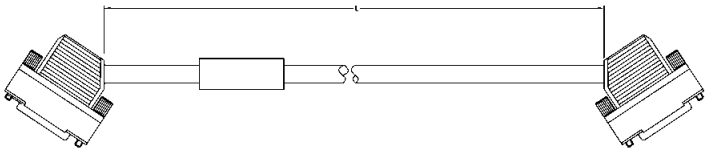
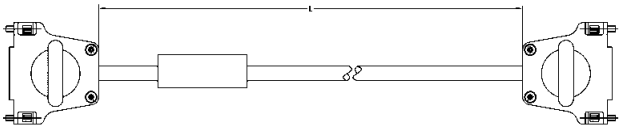
## Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly D-Sub HD 78-pole**<br>Hood: shielded plastic hood with side entry, screw 4-40 UNC<br>Cable: 39 twisted pairs, AWG 26, double shielded, PVC<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m | 33 56 212 0050 028 | | |
| L = 1.0 m | 33 56 213 1000 002 | | |
| L = 2.0 m | 33 56 213 2000 016 | | |
| L = 5.0 m | 33 56 212 0500 029 | | |
| L = 10.0 m | 33 56 212 1000 030 | | |
| L = 20.0 m | 33 56 212 2000 031 | | |
| **Cable assembly D-Sub HD 44-pole**<br>Hood: shielded plastic hood with side entry, screw 4-40 UNC<br>Cable: 22 twisted pairs, AWG 26, double shielded, PVC<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m | 33 56 213 0500 023 | | |
| L = 1.0 m | 33 56 213 1000 024 | | |
| L = 1.5 m | 33 56 213 1500 022 | | |
| L = 2.0 m | 33 56 213 2000 025 | | |
| L = 5.0 m | 33 56 213 5000 026 | | |
| L = 10.0 m | 33 56 212 1000 027 | | |
| **Cable assembly D-Sub HD 44-pole**<br>Hood: metal hood with top entry, screw 4-40 UNC<br>Cable: 24 twisted pairs, AWG 26, double shielded, PVC<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m | 33 56 212 0050 032 | | |
| L = 1.0 m | 33 56 212 0100 033 | | |
| L = 5.0 m | 33 56 212 0500 034 | | |
| L = 10.0 m | 33 56 212 1000 035 | | |
| L = 20.0 m | 33 56 212 2000 036 | | |



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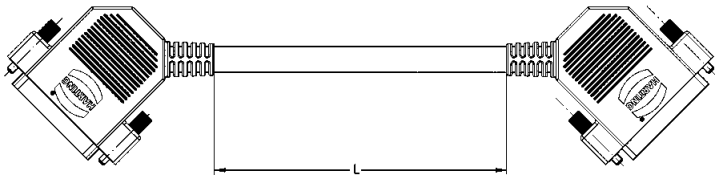
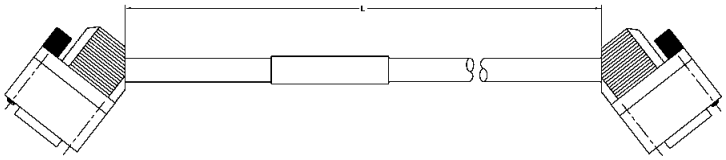
## Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly D-Sub HD 44-pole**<br>Hood: overmoulded with side entry<br>Cable: 24 twisted pairs, solid wires, AWG 26, shielded, halogen free<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m | 33 56 224 5000 001 | | |
| L = 1.0 m | 33 56 221 0010 001 | | |
| L = 2.0 m | 33 56 221 0020 001 | | |
| L = 5.0 m | 33 56 221 0050 001 | | |
| **Cable assembly D-Sub 9-pole**<br>Hood: shielded plastic hood with side entry, screw 4-40 UNC<br>Cable: 5 twisted pairs, stranded, AWG 24, shielded, PVC<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m | 33 66 214 5000 058 | | |
| L = 1.0 m | 33 66 213 1000 059 | | |
| L = 1.5 m | 33 66 213 1500 060 | | |
| L = 2.0 m | 33 66 213 2000 061 | | |
| L = 5.0 m | 33 66 213 5000 062 | | |



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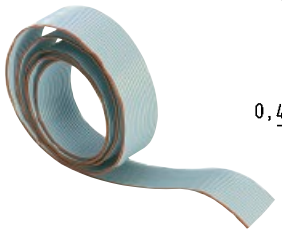
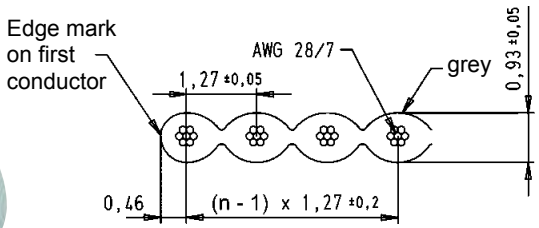
| Identification | No. of contacts | Part number |
|---|---|---|
| **Flat cable** | | |
| grey | | |
| UL AWM-style 2651 | | |
| CSA | | |
| | 9 | 09 18 009 700 ☐ |
| | 15 | 09 18 015 700 ☐ |
| | 25 | 09 18 025 700 ☐ |
| | 37 | 09 18 037 700 ☐ |
| Length per reel | | |
| 30.48 m (100 feet) | 1 | |
| 100 m (328 feet) | 4 | |






| | |
|---|---|
| Conductor material | Copper tinned |
| Gauge | AWG 28/7 0.089 mm² |
| Voltage rating | 300 $V_{r.m.s.}$ |
| Current rating at 25 °C | 2.1 A max. |
| Capacity unbalanced | 45.9 pF/m |
| Impedance unbalanced | 105 Ω |
| Propagation delay | 4.9 ns/m nominal |
| Insulation material | PVC |
| Temperature rating (operating) | –20 °C … +105 °C |
| Temperature rating (static) | –30 °C … +105 °C |
| Flammability rating | UL: VW-1 |
| Insulation resistance | > 100 MΩ/km |

Important: always store reel vertically



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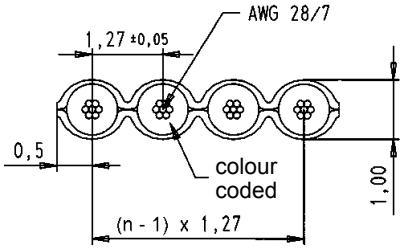
# Cables for insulation displacement termination

| Identification | No. of contacts | Part number |
|---|---|---|
| **Flat cable** | | |
| colour coded | | |
| Length per reel 30.48 m (100 feet) | | |
| UL AWM-style 2651 | | |
| | 9 | 09 18 009 7005 |
| | 15 | 09 18 015 7005 |
| | 25 | 09 18 025 7005 |
| | 37 | 09 18 037 7005 |

Drawing




Dimensions in mm

Colour code sequence (in 10 steps)

brown, red, orange, yellow, green, blue, violet, grey, white, black

| | |
|---|---|
| Conductor material | Copper tinned |
| Gauge | AWG 28/7 0.09 mm² |
| Voltage rating | 300 $V_{r.m.s.}$ |
| Current rating at 25 °C | 2.1 A max. |
| Conductor resistance | 221 mΩ/m |
| Capacity unbalanced | 42.7 pF/m |
| Impedance unbalanced | 105 Ω |
| Inductance unbalanced | 0.68 µH/m |
| Signal delay | 4.9 ns/m |
| Insulation material | PVC |
| Temperature rating (operating) | –20 °C … +105 °C |
| Temperature rating (static) | –30 °C … +105 °C |
| Flammability rating | UL: VW 1 |
| Insulation resistance | 100 MΩ/km |



Important: always store reel vertically



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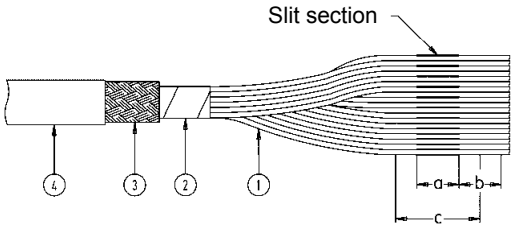
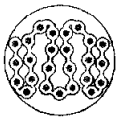
# Cables for insulation displacement termination

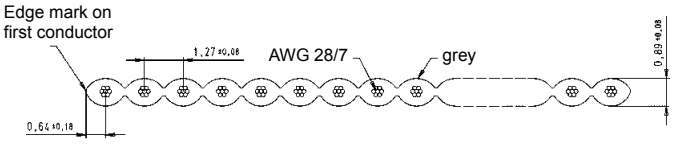


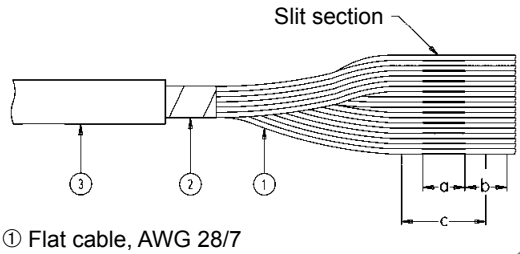
| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Round flat cable** | | | ø max. | |
| with screening (shielding) | 9 | 09 18 009 70 ⌴ | 6.86 | |
| | 15 | 09 18 015 70 ⌴ | 7.62 | |
| | 25 | 09 18 025 70 ⌴ | 9.14 | |
| | 37 | 09 18 037 70 ⌴ | 10.41 | |
| UL listed PLCC CL2<br>CSA certified AWM FT-1 | | | | |
| Length per reel | | | | |
| 30.48 m (100 feet) 07 | | | | |
| 100 m (328 feet) 10 * | | | | |
| without screening (shielding) | 9 | 09 18 009 7008 | 6.35 | |
| | 15 | 09 18 015 7008 | 6.86 | |
| | 25 | 09 18 025 7008 | 8.38 | |
| | 37 | 09 18 037 7008 | 9.65 | |
| UL listed PLCC CL2<br>CSA certified AWM FT-1 | | | | |
| Length per reel<br>30.48 m (100 feet) | | | | |




① Flat cable, AWG 28/7
② Aluminium / Polyester tape (spiral wrap)
③ 85 % minimum coverage tinned copper braid
④ Outer jacket: black PVC






① Flat cable, AWG 28/7
② Clear polyester
③ Outer jacket: black PVC

| No. of contacts | a | b | c |
|---|---|---|---|
| 9 to 25 | 19.05 | 19.05 | 38.10 |
| 37 | 38.10 | 19.05 | 57.15 |

| | |
|---|---|
| Conductor material | Copper tinned |
| Gauge | AWG 28/7 0.089 mm² |
| Voltage rating | 300 $V_{r.m.s.}$ |
| Conductor resistance | 225 mΩ/m |
| Capacity unbalanced | 78.7 pF/m |
| Impedance unbalanced | 75 Ω |
| Signal delay | 5.25 ns/m nom. |
| Insulation material | PVC |
| Temperature rating | –20 °C … +105 °C |
| Flammability rating | UL: VW 1 |
| Insulation resistance | $10^4$ MΩ/km |

* Only available for 37 contacts
Important: always store reals vertically



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# Notes





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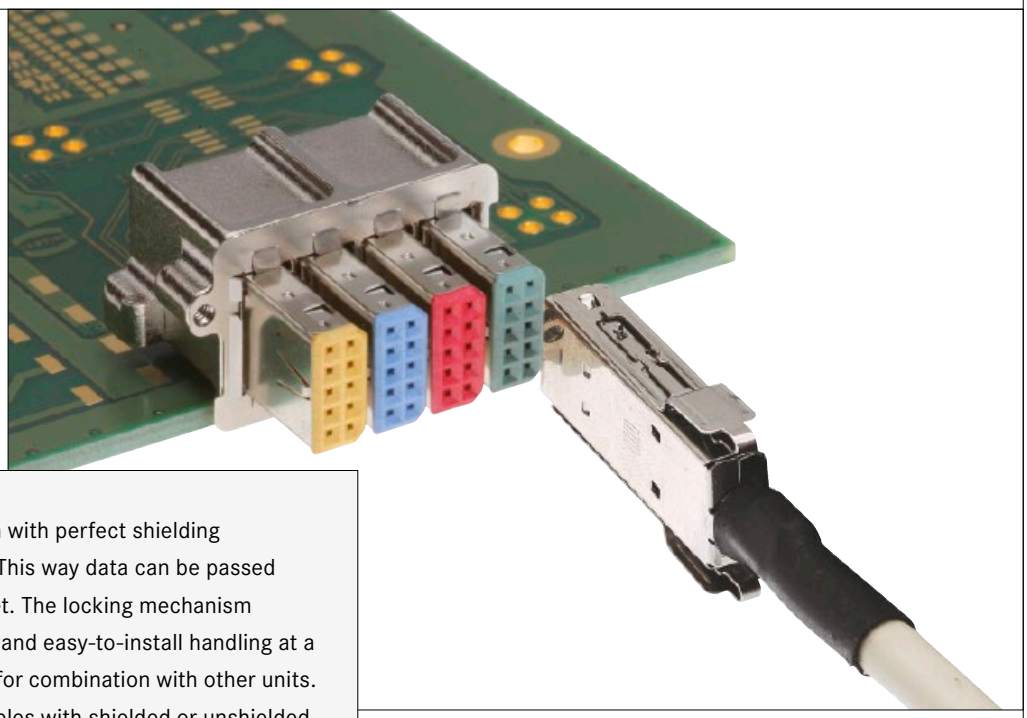
# 07. *har-link*® Interface Connectors



The highest data rates in combination with perfect shielding characterize the *har-link*® connector. This way data can be passed on optimally within the control cabinet. The locking mechanism ensures a vibration-proof connection and easy-to-install handling at a minimum size and maximum options for combination with other units. HARTING offers assembled system cables with shielded or unshielded twisted pairs for the *har-link*® connector family.

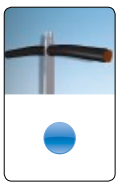
*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| | ● | ● | | ● | | | ● | ● | ● | |

**Cable termination**

*Han-Quick Lock*®

*IDC*



●

*Crimp*

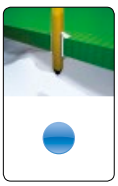
*Screw*

*Cage clamp*

*Axial screw*

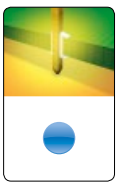
**PCB termination**

*THT*



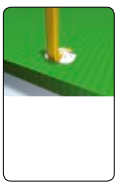
●

*SMC*

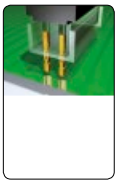


●

*SMT*



*Press-in*



**Application standard**

**Housing integration**

*Separate housing*

●

*Integrated housing*

●

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## Contents


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|---|---|
| har-link® connector system – introduction | **07.02** |
| har-link® connector system – general information | **07.04** |
| Technical characteristics | **07.05** |
| Male and female connectors | **07.06** |
| Accessories and cable assemblies | **07.07** |






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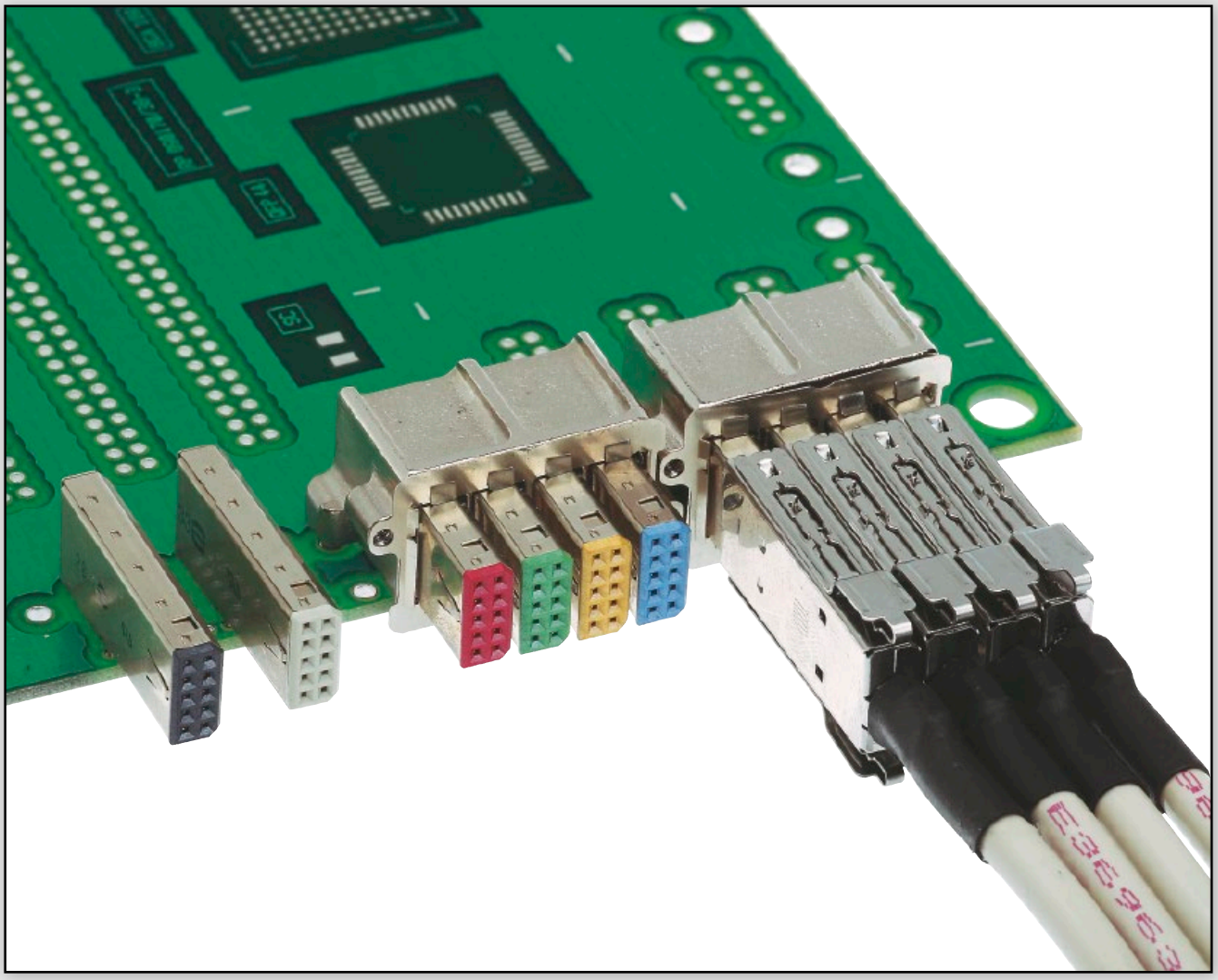
## METRIC *har-link*® INTERFACE CONNECTORS IN 2.0 mm PITCH

HARTING's modular interface connector system, *har-link*® in 2.0 mm pitch, allows data transfer rates up to 2 Gbit/s.
The *har-link*® connector system of HARTING complies with the requirements of IEC 61076-4-107 and is a compact and robust PCB-to-cable interface with excellent data transmission properties.
All dimensions of the *har-link*® connector are in accordance with IEC 917 and IEEE P 1301 specifications, allowing an easy implementation into both metric and inch-based systems.
*har-link*® also supports hot plugging as required by modern bus systems such as CompactPCI, S-bus and VME.

*har-link*® allows data transmission up to 2 Gbit/s per pair and is therefore perfectly suited for modern transmission protocols such as Low Voltage Differential Signals (LVDS).
The thorough EMI shielding of the *har-link*® connector is a guarantee of its superior performance in the EMI-polluted environment.
The high temperature resistant material of the female *har-link*® connector supports reflow soldering.
In addition, HARTING provides cable assemblies. A crimping tool range for terminating male *har-link*® connectors is also available.







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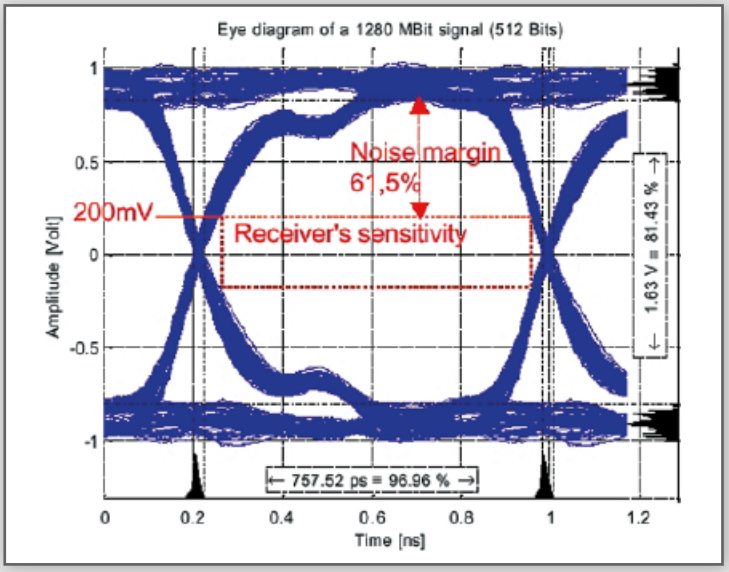
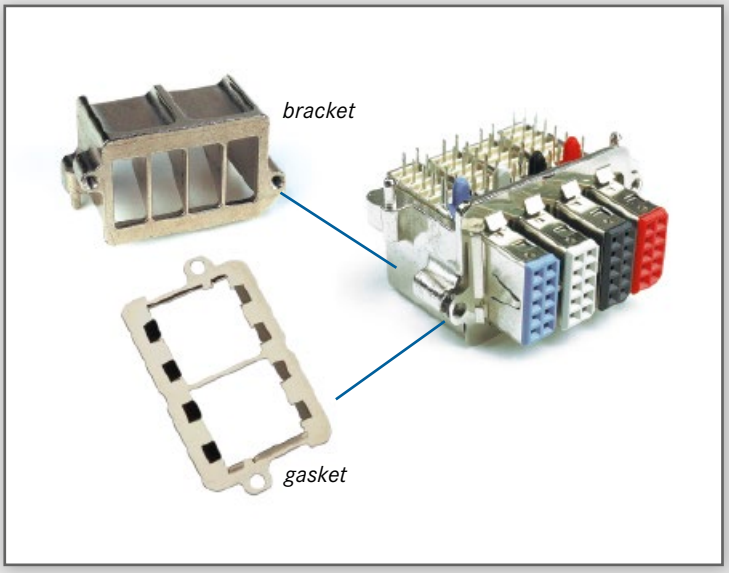
# Specific features of the product range

- Data transmission up to 2 Gbit/s
- Is perfectly suited for modern transmission protocols such as Low Voltage Differential Signals (LVDS)




- A screening attenuation of more than 50 dB up to 1 GHz
- The high temperature resistant material of the female *har-link*® connector supports reflow soldering




- Shielding with integrated locking levers
- Due to the locking levers on both sides of the male connector, the connection withstands a pulling force up to 80 N

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The har:link® connector system of HARTING complies with the requirements of IEC 61076-4-107 and is a compact and robust pcb-to-cable interface with excellent data transmission properties for high-speed networking and telecommunications.

All dimensions of the har:link® connector are in accordance with IEC 917 and IEEE P 1301 requirements, which allows for easy implementation into both metric and inch-based systems. In addition, har:link® supports hot plugging as required by modern bus systems such as CompactPCI, S-bus and VME.

har:link® allows data transmission up to 2 Gbit/s per pair and is therefore perfectly suited for modern transmission protocols such as Low Voltage Differential Signals (see Fig. 1). The design of the har:link® connector allows differential pairs to be placed horizontally (parallel to the pcb), thus reducing the skew at high frequencies and considering high signal integrity.

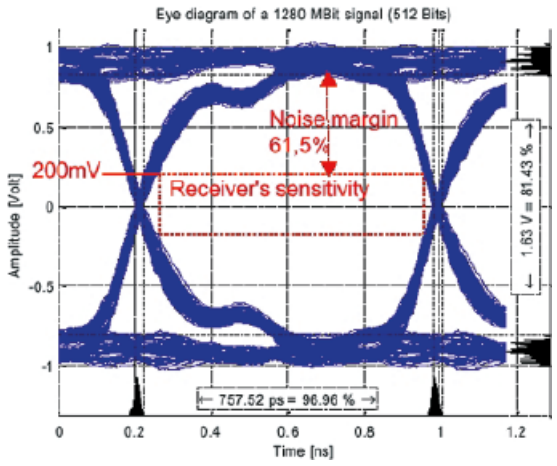


Fig. 1: Eye diagram of a 1280 MBit signal (512 Bits)

The metal shells of the har:link® connector are a guarantee for its superior performance in the EMI-polluted environment (see Fig. 2).

Fig. 2: 360° screened-can construction with locking levers

To reach a screening attenuation of more than 50 dB up to 1 GHz, HARTING offers brackets covering each connector in conjunction with a gasket, which is compressed between the bracket and the front panel (see Fig. 3).

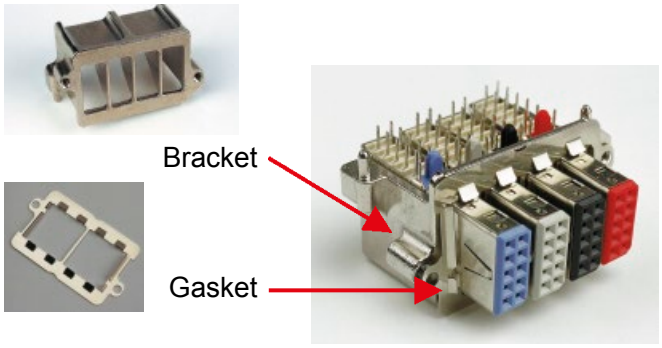


Fig. 3: 4 cavities bracket and gasket

Once plugged, the mated pair shows excellent mating safety. Due to the locking levers on both sides of the male connector, the connection withstands a pulling force of up to 80 N (see Fig. 2).

The high temperature resistant material of the har:link® female connector body supports the safe reflow soldering process. For easy identification of female modules, six different colours are available (see Fig. 4).

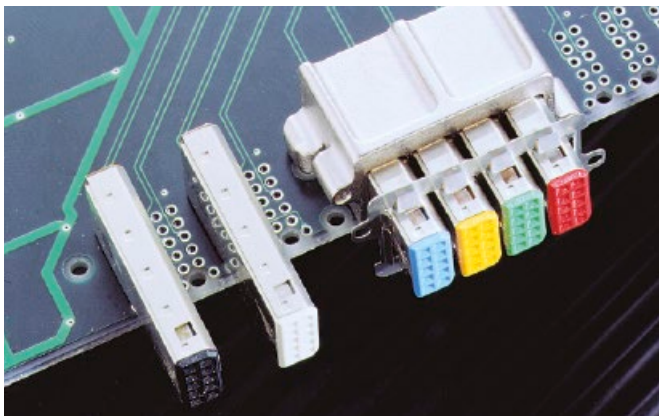

Fig. 4: Female modules

In addition to single connectors, HARTING provides cable assemblies with unshielded twisted pairs or with shielded twisted pairs for high speed applications such as IEEE 1355. A crimping tool range for terminating the male har:link® connectors is available.



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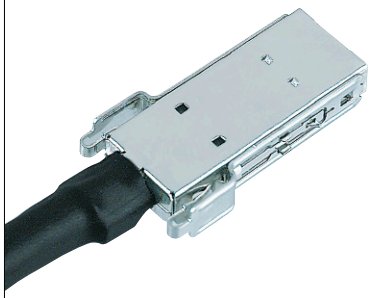
| | |
|---|---|
| Number of contacts | 10 |
| Approvals | IEC 61076-4-107<br>UL recognized: E102079 |
| Contact pitch<br>Connector pitch | 2 mm<br>6 mm |
| Working current | 1.5 A at 70 °C |
| Test voltage $U_{r.m.s.}$ | 750 V |
| Contact resistance<br>Insulation resistance | ≤ 35 mΩ<br>≥ $10^{10}$ Ω |
| Temperature range<br>during reflow soldering | -55 °C … +125 °C<br>female:<br>max. + 260 °C for 60 s |
| Mating cycles | 250, performance level 2 |
| Terminations | Insulation displacement (male), AWG 28/7 - 30/7, AWG 30 solid<br>Solder pins for ø 0.6 mm min. (female) |
| Insertion force<br>Withdrawal force | 10 N max. / module<br>2 N min. / module (without locking levers) |
| Latching system | Locking levers |
| **Materials** | |
| Mouldings | Male connector: Polyester, UL 94-V0<br>Female connector: High temperature plastic material, UL 94-V0 |
| Contacts | Copper alloy |
| Shells | Male connector: Stainless steel<br>Female connector: Silver nickel |
| **Contact surface** | |
| Contact zone | Selectively plated according to performance level |







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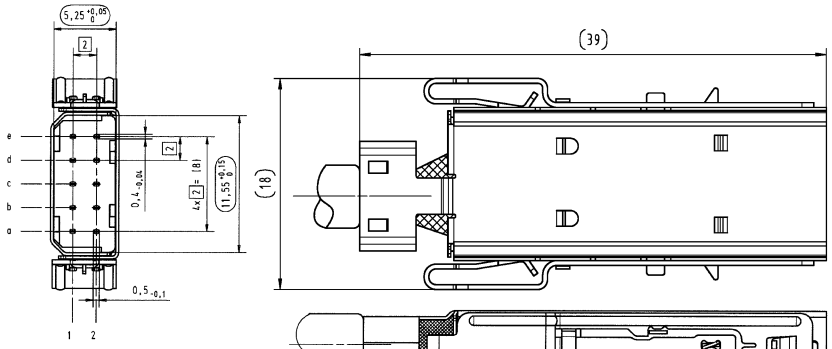
## Male connectors, straight
## Female connectors, angled

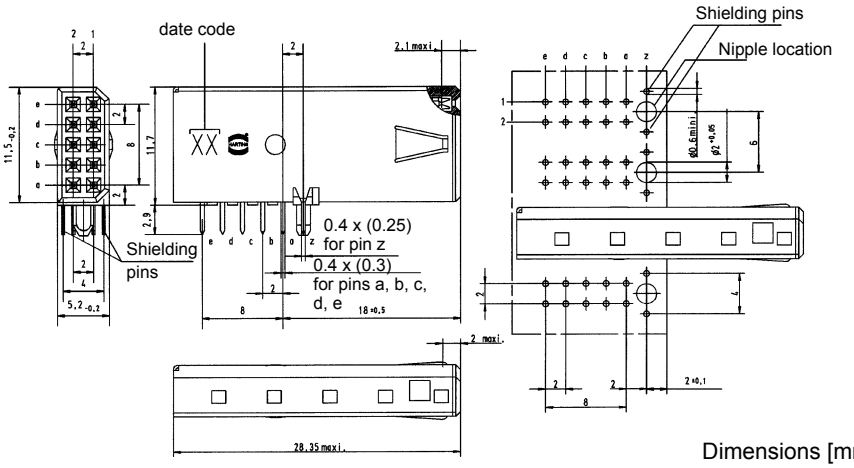
| Identification | No. of contacts | Colour | Part number |
|---|---|---|---|
| **Male connector** | | | |
| for insulation displacement | 10 | Black | 27 11 161 8001 |
| **Female connector** | | | |
| with solder pins | 10 | Beige (standard) | 27 21 121 8000 |
| | 10 | Red | 27 21 121 8002 |
| | 10 | Yellow | 27 21 121 8004 |
| | 10 | Green | 27 21 121 8005 |
| | 10 | Blue | 27 21 121 8006 |
| | 10 | Black | 27 21 121 8010 |

**Male connector**
(delivered in piece parts)



Manuals for the *har-link*® cable free connector assemblies are available on demand. Please contact your local HARTING representative.

**Female connector**




Dimensions [mm]



Tooling see chapter 20

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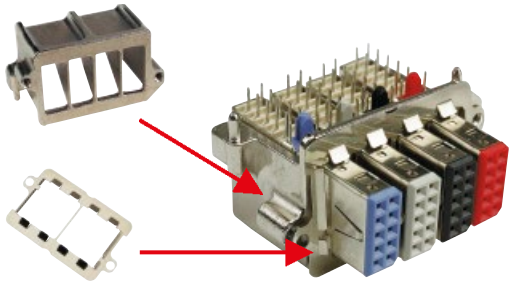
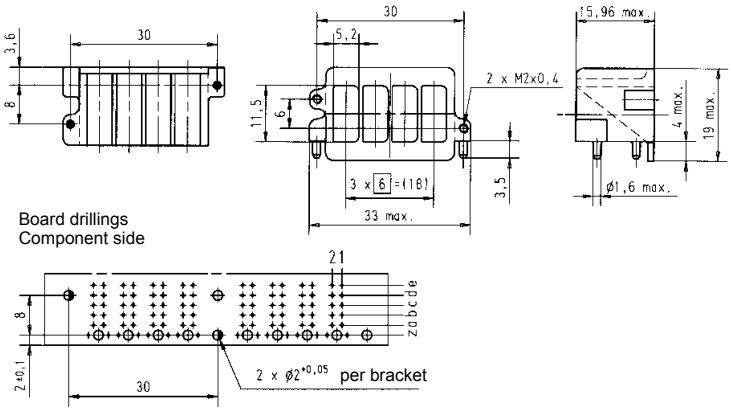
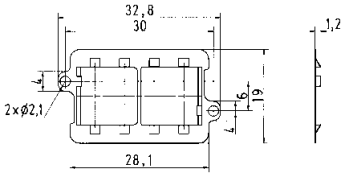
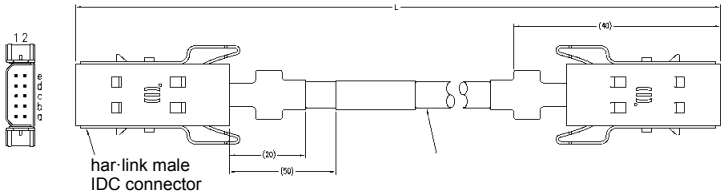
# Accessories and cable assemblies



| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Bracket**<br>with four cavities | 27 71 040 0001 |  | |
| **Gasket**<br>with four cavities | 27 71 040 0002 |  | |
| **Standard *har-link*® cable assembly**<br>Cable: 5 twisted pairs, AWG 28, shielded, PVC<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m | 33 27 243 0500 001 | | |
| L = 1.0 m | 33 27 243 1000 002 | | |
| L = 2.0 m | 33 27 243 2000 003 | | |
| **High end *har-link*® cable assembly**<br>Cable: 5 twisted pairs, AWG 30, double shielded, PVC<br>Wiring: 1:1 | | | |
| Length: L = 0.5 m | 33 27 243 0500 006 | | |
| L = 1.0 m | 33 27 243 1000 007 | | |
| L = 2.0 m | 33 27 243 2000 008 | | |
| Cable: 5 twisted pairs, AWG 30, double shielded, PVC<br>Wiring: acc. to IEEE 1355 | | IEEE 1355 wiring | |
| Length: L = 0.5 m | 33 27 243 0500 015 | | |
| L = 1.0 m | 33 27 243 1000 016 | | |
| L = 2.0 m | 33 27 243 2000 017 | | |

| Connector 1 | Connector 2 |
|---|---|
| 2-e | 1-a |
| 1-e | 2-a |
| 2-d | 1-b |
| 1-d | 2-b |
| 2-c | 2-c |

| Connector 1 | Connector 2 |
|---|---|
| 1-c | 1-c |
| 2-b | 1-d |
| 1-b | 2-d |
| 2-a | 1-e |
| 1-a | 2-e |





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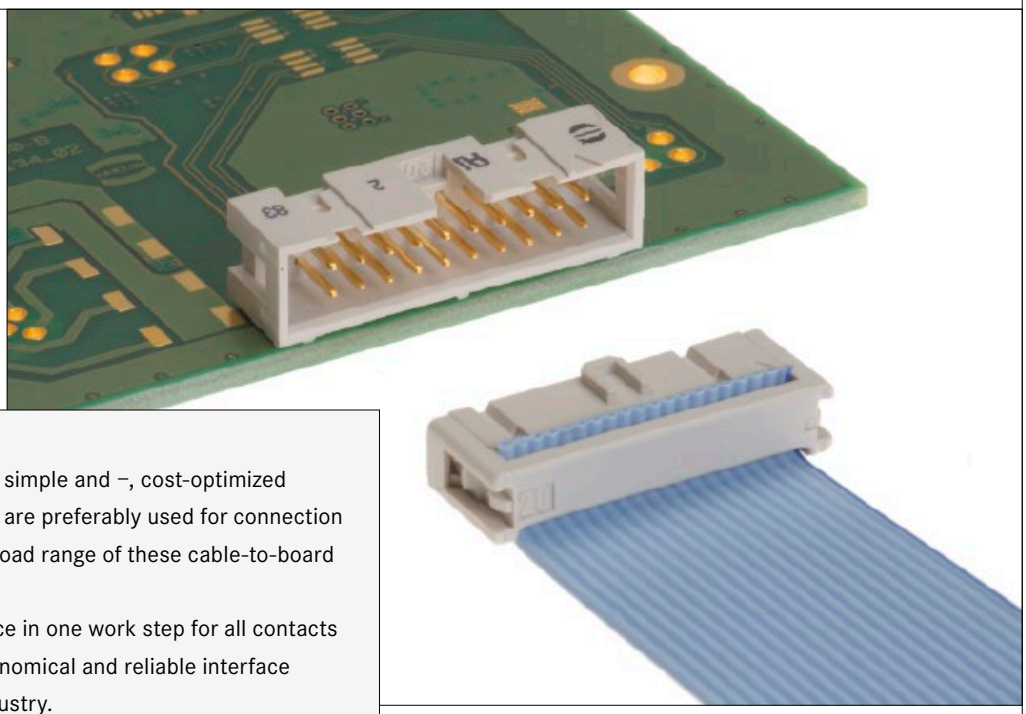
# 08. SEK IDC Connectors



SEK connectors for flat cables enable simple and –, cost-optimized device configuration. SEK connectors are preferably used for connection within the device. HARTING offers a broad range of these cable-to-board connectors.
Assembly on the cable side takes place in one work step for all contacts via flat conductors. The SEK is an economical and reliable interface for data and signal applications in industry.

*Application profile:*

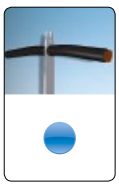
| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| | ● | ● | | ● | ● | | | | ● | |

**Cable termination**

*Han-Quick Lock®*

*Screw*

*IDC*



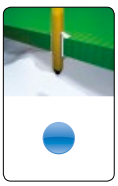
*Cage clamp*

*Crimp*

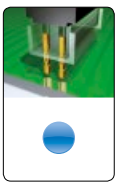
*Axial screw*

**PCB termination**

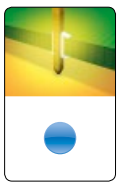
*THT*



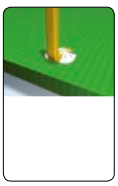
*Press-in*



*SMC*



*SMT*



**Application standard**

**Housing integration**

*Separate housing*

*Integrated housing*

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| General information | **08.04** |
| Solder board connectors | **08.05** |
| Male standard connectors | **08.06** |
| Male low-profile conncectors | **08.14** |
| Accessories | **08.16** |
| Wrap post connectors | |
| Male standard connectors | **08.17** |
| Accessories | **08.20** |
| Cable connectors | |
| Female connectors | **08.21** |
| Pcb transition connectors, 2 rows | **08.24** |
| Pcb transition connectors, 4 rows | **08.28** |
| DIP connectors | **08.30** |
| DIN 41612 connectors | **08.32** |
| Press-in connectors | |
| Male low-profile connectors | **08.34** |
| SMC solder board connectors | |
| Male standard SMC connectors | **08.36** |
| Male low-profile SMC connectors | **08.46** |
| Accessories | **08.48** |
| Cables and cable assemblies | **08.49** |






Tooling see chapter 20

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## IDC CONNECTOR SYSTEM
## [2.54 mm X 2.54 mm PITCH] FOR FLAT CABLES

HARTING's product range of flat cable connectors is designed for various cable-to-PCB applications. The HARTING SEK insulation displacement connector technology meets all requirements of the IEC 60 603-13.
HARTING assembles each SEK connector with the matching cable type according to customer specifications in order to simplify customer installation and storage.

The different types of board connectors offer 6 to 64 pins in various terminations such as solder (manual, wave or reflow) or press-in.
The cable connectors are equally suited for indoor use as well as for outdoor applications and harsh environments.

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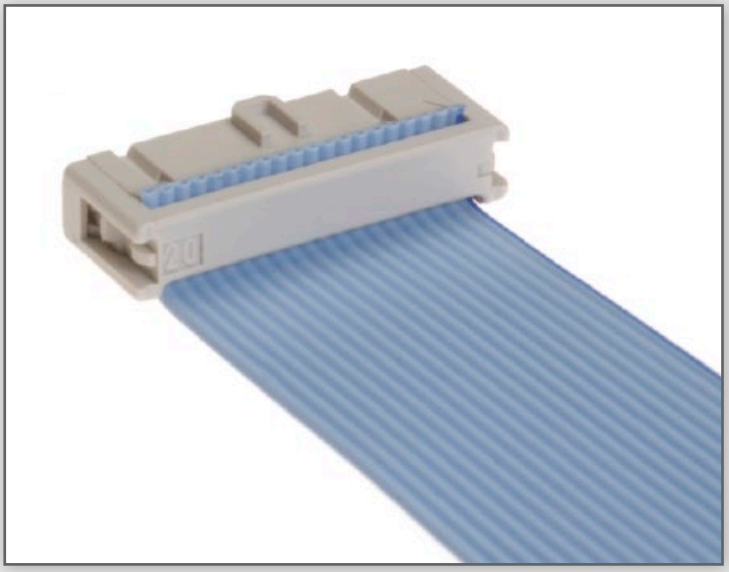
# Specific features of the product range



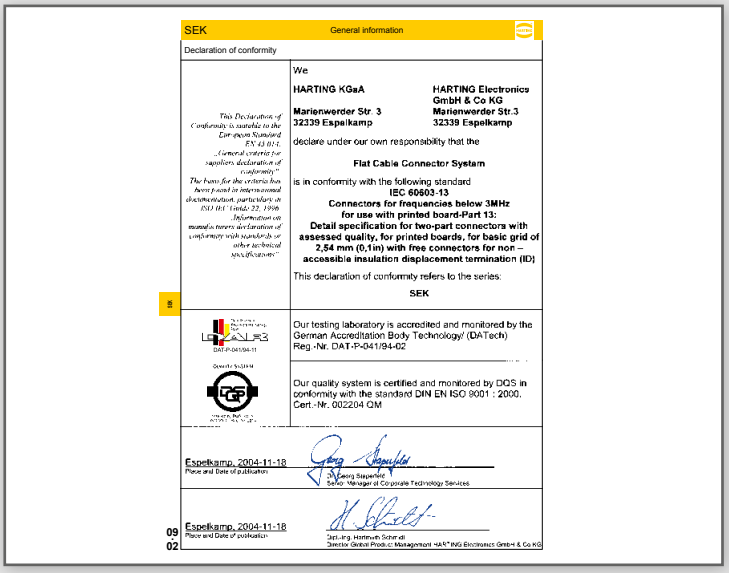
## CABLE ASSEMBLIES

- HARTING can supply cable assemblies according to your specifications.
- A wide range of connector types available with various contact arrangements constitute the ideal solution to your wiring problems.
- Cables of all types in economic reel lengths are available.



## QUALITY

- Cables professionally assembled on HARTING work stations ensure reliable connections.
- Finished harnesses are subject to 100% quality checks on a HARTING test device.
- Insulation test by 1000 V.
- Contact resistance test.



SEK General information

Declaration of conformity

We

**HARTING KGaA**
**Marienwerder Str. 3**
**32339 Espelkamp**

**HARTING Electronics GmbH & Co KG**
**Marienwerder Str.3**
**32339 Espelkamp**

declare under our own responsibility that the

**Flat Cable Connector System**

is in conformity with the following standard
**IEC 60603-13**
**Connectors for frequencies below 3MHz for use with printed board-Part 13: Detail specification for two-part connectors with assessed quality, for printed boards, for basic grid of 2,54 mm (0,1in) with free connectors for non – accessible insulation displacement termination (ID)**

This declaration of conformity refers to the series:
**SEK**

Our testing laboratory is accredited and monitored by the German Accreditation Body Technology/ (DATech)
Reg.-Nr. DAT-P-041/94-02

Our quality system is certified and monitored by DQS in conformity with the standard DIN EN ISO 9001 : 2000.
Cert.-Nr. 002204 QM

Espelkamp, 2004-11-18
Place and Date of publication

Georg Sapetko
Safety Manager at Corporate Technology Services

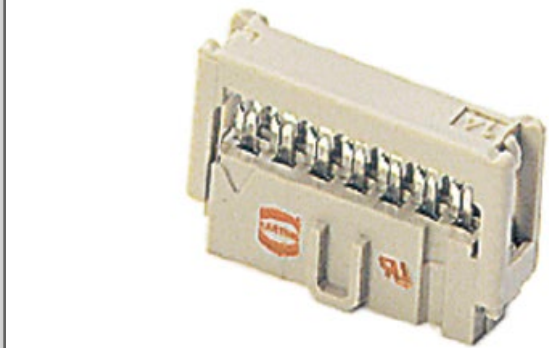
Espelkamp, 2004-11-18
Place and Date of publication

Dipl.-Ing. Hartmuth Schmidt
Director Global Product Management HARTING Electronics GmbH & Co KG

09
02

## ECONOMY

- The tested assembly of connectors and flat cables from one manufacturer guarantees a high degree of economy and reliability.
- Investments for work stations and test devices are not required.
- Stocks of piece parts are reduced.





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# The HARTING Insulation Displacement Connector system

## Economic and reliable connections

The flat cable and connector can be preassembled and used as a component with predetermined functional characteristics.

The HARTING insulation displacement contacts pierce the insulation on the flat cable to provide a durable gastight connection with the wire.

The HARTING insulation displacement technique constitutes the ideal solution to your wiring problems.

For “non standard applications” we can manufacture designs to match your requirements.
Please discuss requirements with us.

HARTING SEK connectors incorporate the latest design features and provide the assurance of high quality and reliability with economy.

**Cable assemblies**

- HARTING can supply cable assemblies to customer specifications.
- A wide range of connector types available with various contact arrangements constitute the ideal solution to your wiring problems.
- Cables of all types in economic reel lengths are available.

**Quality**

- Cables professionally assembled on HARTING work stations ensure reliable connections.
- Finished harnesses are subject to 100% quality checks on a HARTING test device.
- Insulation test.
- Contact resistance test.

**Economy**

- The tested assembly of connectors and flat cables from one manufacturer guarantees a high degree of economy and reliability.
- Investment for work stations and test devices are not required.
- Stocks of piece parts are reduced.



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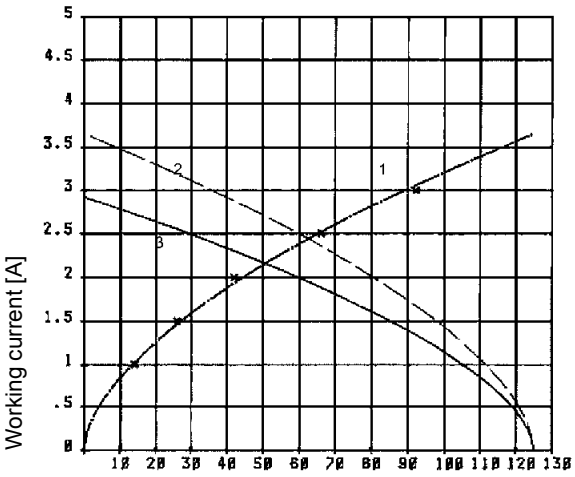
| | |
|---|---|
| Number of contacts | 6, 10, 14, 16, 20, 24, 26, 30, 34, 40, 50, 60, 64 |
| Contact arrangement | straight, angled |
| Contact length | 2.9 mm, 4.5 mm |
| Approvals | IEC 60603-13<br>DIN EN 60603-13<br>D 2632<br>BT 224<br>NFC 93-428 (HE 10)<br><br>UL recognized: E102079 |
| Pitch | 2.54 mm [0.100“] |
| Working current | 1 A |
| Working voltage | 500 V<br>for pollution degree 1 |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Contact resistance<br>Insulation resistance | ≤ 20 mΩ<br>≥ $10^9$ Ω |
| Temperature range | -55 °C … +125 °C<br>The maximum temperature includes heating of contacts and ambient temperature |
| Terminations | For pcb hole Ø 1 ± 0.1 mm<br>DIN IEC 52141<br>Diagonal: 0.79 mm |
| Materials<br>Moulding | <br>Thermoplastic resin (PBT)<br>UL 94-V0 |
| Contact surface<br>Contact zone | <br>plated according to performance level[1)] |

## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.
The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60512.




Example: 50 way connector
① Temperature rise
② Derating
③ Derating curve at $I_{max.}$ x 0.8 (IEC 60512-2)

## Insertion and withdrawal forces

| Number of contacts | Maximum force [N] | |
|---|---|---|
| | Performance level 1 and 2 | Performance level 3 |
| 6 | 12 | 18 |
| 10 | 20 | 30 |
| 14 | 28 | 42 |
| 16 | 32 | 48 |
| 20 | 40 | 60 |
| 24 | 48 | 72 |
| 26 | 52 | 78 |
| 30 | 60 | 90 |
| 34 | 68 | 102 |
| 40 | 80 | 120 |
| 50 | 100 | 150 |
| 60 | 120 | 180 |
| 64 | 128 | 192 |

[1)] Performance level 3 as per IEC 60603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60603-13, ≥ 250 mating cycles, 4 days gas test
S4, plating = 0.76 µm (30 µinch) Au or PdNi eqivalent



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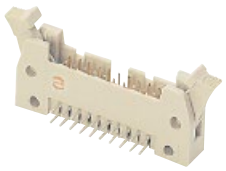
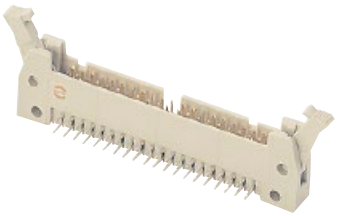
Number of contacts

# 6–64

## Male header with angled solder pins

| Identification | No. of contacts | Part number ← Without levers | With short levers | With long levers → |
|---|---|---|---|---|
| **Male header with angled solder pins** Length: 2.9 mm | 6 | 09 18 506 ⌴ 923 | 09 18 506 ⌴ 913 | 09 18 506 ⌴ 903 |
| | 10 | 09 18 510 ⌴ 923 | 09 18 510 ⌴ 913 | 09 18 510 ⌴ 903 |
| | 14 | 09 18 514 ⌴ 923 | 09 18 514 ⌴ 913 | 09 18 514 ⌴ 903 |
| | 16 | 09 18 516 ⌴ 923 | 09 18 516 ⌴ 913 | 09 18 516 ⌴ 903 |
| | 20 | 09 18 520 ⌴ 923 | 09 18 520 ⌴ 913 | 09 18 520 ⌴ 903 |
| | 24 | 09 18 524 ⌴ 923 | 09 18 524 ⌴ 913 | 09 18 524 ⌴ 903 |
| | 26 | 09 18 526 ⌴ 923 | 09 18 526 ⌴ 913 | 09 18 526 ⌴ 903 |
| | 30 | 09 18 530 ⌴ 923 | 09 18 530 ⌴ 913 | 09 18 530 ⌴ 903 |
| | 34 | 09 18 534 ⌴ 923 | 09 18 534 ⌴ 913 | 09 18 534 ⌴ 903 |
| | 40 | 09 18 540 ⌴ 923 | 09 18 540 ⌴ 913 | 09 18 540 ⌴ 903 |
| | 50 | 09 18 550 ⌴ 923 | 09 18 550 ⌴ 913 | 09 18 550 ⌴ 903 |
| | 60 | 09 18 560 ⌴ 923 | 09 18 560 ⌴ 913 | 09 18 560 ⌴ 903 |
| | 64 | 09 18 564 ⌴ 923 | 09 18 564 ⌴ 913 | 09 18 564 ⌴ 903 |
| Kinked version on request | | | | |
| **Male header with angled solder pins** Length: 4.5 mm | 6 | 09 18 506 ⌴ 921* | 09 18 506 ⌴ 911* | 09 18 506 ⌴ 901* |
| | 10 | 09 18 510 ⌴ 921* | 09 18 510 ⌴ 911* | 09 18 510 ⌴ 901* |
| | 14 | 09 18 514 ⌴ 921* | 09 18 514 ⌴ 911* | 09 18 514 ⌴ 901* |
| | 16 | 09 18 516 ⌴ 921* | 09 18 516 ⌴ 911* | 09 18 516 ⌴ 901* |
| | 20 | 09 18 520 ⌴ 921* | 09 18 520 ⌴ 911* | 09 18 520 ⌴ 901* |
| | 24 | 09 18 524 ⌴ 921* | 09 18 524 ⌴ 911* | 09 18 524 ⌴ 901* |
| | 26 | 09 18 526 ⌴ 921* | 09 18 526 ⌴ 911* | 09 18 526 ⌴ 901* |
| | 30 | 09 18 530 ⌴ 921* | 09 18 530 ⌴ 911* | 09 18 530 ⌴ 901* |
| | 34 | 09 18 534 ⌴ 921* | 09 18 534 ⌴ 911* | 09 18 534 ⌴ 901* |
| | 40 | 09 18 540 ⌴ 921* | 09 18 540 ⌴ 911* | 09 18 540 ⌴ 901* |
| | 50 | 09 18 550 ⌴ 921* | 09 18 550 ⌴ 911* | 09 18 550 ⌴ 901* |
| | 60 | 09 18 560 ⌴ 921* | 09 18 560 ⌴ 911* | 09 18 560 ⌴ 901* |
| | 64 | 09 18 564 ⌴ 921* | 09 18 564 ⌴ 911* | 09 18 564 ⌴ 901* |
| Kinked version on request | | | | |

* Not normally kept in stock
For accessories see page 08.16
For dimensions see page 08.07

For performance level 3 please specify digit 7 6 5 *
For performance level 2 please specify digit 7 6 5 *
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 7 6 5 *



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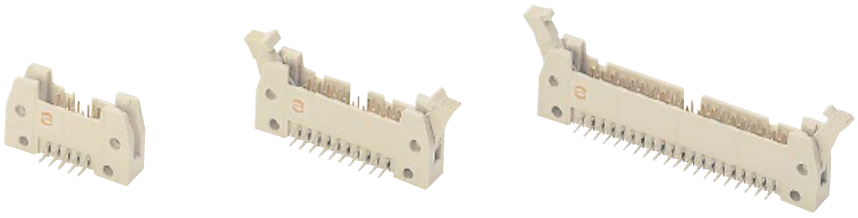
Number of contacts

# 6–64

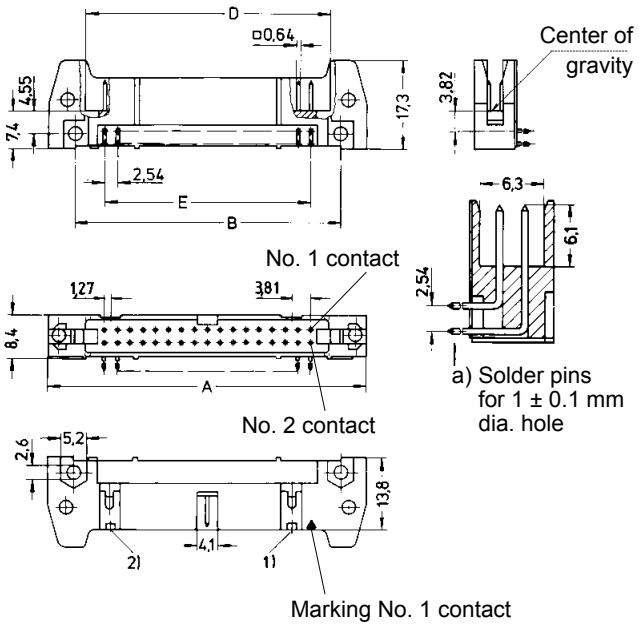


## Male header with angled solder pins

| Identification | Drawing | Dimensions in mm |
|---|---|---|

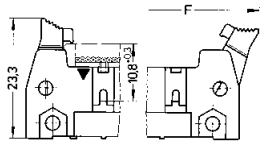
### Male header

| No. of contacts | A | B | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 | 26.9 | 16.76 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 21.84 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 26.92 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 29.46 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 34.54 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 39.62 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 42.16 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 47.24 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 52.32 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 59.94 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 72.64 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 85.34 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 90.42 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |



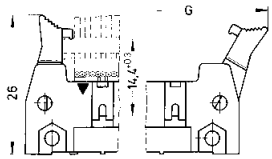

Short levers

for use with female connector without strain relief clamp

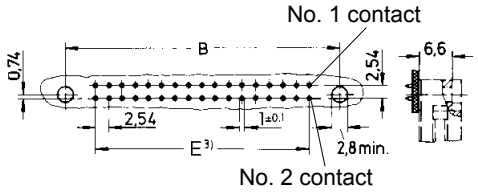



Long levers

for use with female connector with strain relief clamp




### Board drillings




For accessories see page 08.16

1) No polarization slot for 6, 10 or 14 way male header

2) No polarization slot for 6 way male header

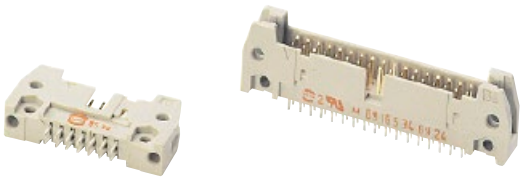
3) Pitch tolerance: ± 0.1



Downloaded from Arrow.com.

Number of contacts

# 6–64



## Male header with straight solder pins

| Identification | No. of contacts | Part number Without levers | With short levers | With long levers |
|---|---|---|---|---|
| **Male header with straight solder pins** Length: 2.9 mm | | | | |
| | 6 | 09 18 506 ⌴ 924 | 09 18 506 ⌴ 914 | 09 18 506 ⌴ 904 |
| | 10 | 09 18 510 ⌴ 924 | 09 18 510 ⌴ 914 | 09 18 510 ⌴ 904 |
| | 14 | 09 18 514 ⌴ 924 | 09 18 514 ⌴ 914 | 09 18 514 ⌴ 904 |
| | 16 | 09 18 516 ⌴ 924 | 09 18 516 ⌴ 914 | 09 18 516 ⌴ 904 |
| | 20 | 09 18 520 ⌴ 924 | 09 18 520 ⌴ 914 | 09 18 520 ⌴ 904 |
| | 24 | 09 18 524 ⌴ 924 | 09 18 524 ⌴ 914 | 09 18 524 ⌴ 904 |
| | 26 | 09 18 526 ⌴ 924 | 09 18 526 ⌴ 914 | 09 18 526 ⌴ 904 |
| | 30 | 09 18 530 ⌴ 924 | 09 18 530 ⌴ 914 | 09 18 530 ⌴ 904 |
| | 34 | 09 18 534 ⌴ 924 | 09 18 534 ⌴ 914 | 09 18 534 ⌴ 904 |
| | 40 | 09 18 540 ⌴ 924 | 09 18 540 ⌴ 914 | 09 18 540 ⌴ 904 |
| | 50 | 09 18 550 ⌴ 924 | 09 18 550 ⌴ 914 | 09 18 550 ⌴ 904 |
| | 60 | 09 18 560 ⌴ 924 | 09 18 560 ⌴ 914 | 09 18 560 ⌴ 904 |
| | 64 | 09 18 564 ⌴ 924 | 09 18 564 ⌴ 914 | 09 18 564 ⌴ 904 |
| **Male header with straight solder pins** Length: 4.5 mm | | | | |
| | 6 | 09 18 506 ⌴ 922* | 09 18 506 ⌴ 912* | 09 18 506 ⌴ 902* |
| | 10 | 09 18 510 ⌴ 922* | 09 18 510 ⌴ 912* | 09 18 510 ⌴ 902* |
| | 14 | 09 18 514 ⌴ 922* | 09 18 514 ⌴ 912* | 09 18 514 ⌴ 902* |
| | 16 | 09 18 516 ⌴ 922* | 09 18 516 ⌴ 912* | 09 18 516 ⌴ 902* |
| | 20 | 09 18 520 ⌴ 922* | 09 18 520 ⌴ 912* | 09 18 520 ⌴ 902* |
| | 24 | 09 18 524 ⌴ 922* | 09 18 524 ⌴ 912* | 09 18 524 ⌴ 902* |
| | 26 | 09 18 526 ⌴ 922* | 09 18 526 ⌴ 912* | 09 18 526 ⌴ 902* |
| | 30 | 09 18 530 ⌴ 922* | 09 18 530 ⌴ 912* | 09 18 530 ⌴ 902* |
| | 34 | 09 18 534 ⌴ 922* | 09 18 534 ⌴ 912* | 09 18 534 ⌴ 902* |
| | 40 | 09 18 540 ⌴ 922* | 09 18 540 ⌴ 912* | 09 18 540 ⌴ 902* |
| | 50 | 09 18 550 ⌴ 922* | 09 18 550 ⌴ 912* | 09 18 550 ⌴ 902* |
| | 60 | 09 18 560 ⌴ 922* | 09 18 560 ⌴ 912* | 09 18 560 ⌴ 902* |
| | 64 | 09 18 564 ⌴ 922* | 09 18 564 ⌴ 912* | 09 18 564 ⌴ 902* |

Kinked version on request

* Not normally kept in stock
For accessories see page 08.16
For dimensions see page 08.09

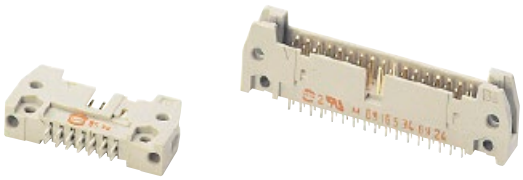
For performance level 3 please specify digit 7 6 5 *
For performance level 2 please specify digit 7 6 5 *
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 7 6 5 *



Downloaded from Arrow.com.

Number of contacts

# 6–64

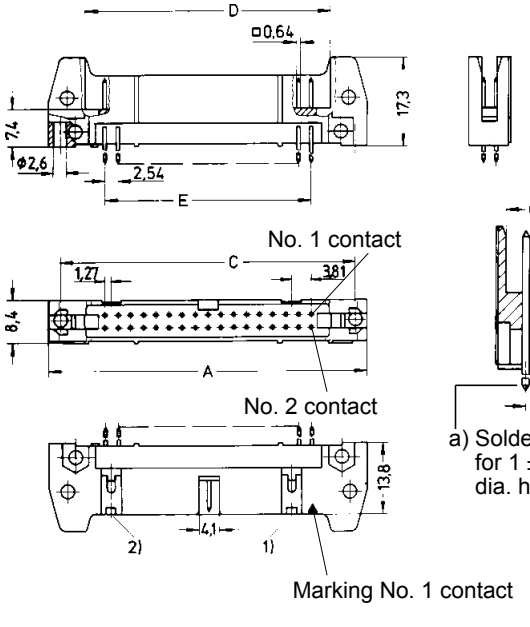


## Male header with straight solder pins

| Identification | Drawing | Dimensions in mm |
|---|---|---|

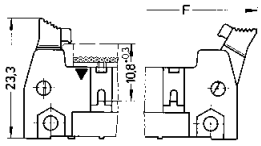
Male header

| No. of contacts | A | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 | 26.9 | 22.86 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 27.94 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 33.02 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 35.56 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 40.64 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 45.72 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 48.26 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 53.34 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 58.42 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 66.04 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 78.74 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 91.44 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 96.52 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |



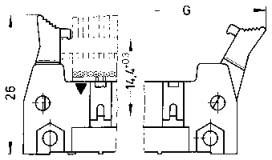

Short levers

for use with female connector without strain relief clamp

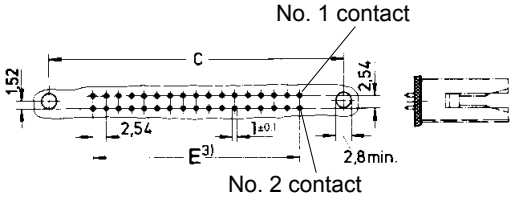



Long levers

for use with female connector with strain relief clamp




Board drillings




For accessories see page 08.16

1) No polarization slot for 6, 10 or 14 way male header

2) No polarization slot for 6 way male header

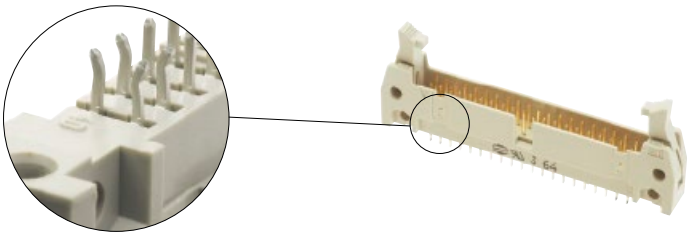
3) Pitch tolerance: ± 0.1



Downloaded from Arrow.com.

Number of contacts

# 6–64



## Male header with straight solder pins, kinked

| Identification | No. of contacts | Part number: Without levers | Part number: With short levers | Part number: With long levers |
|---|---|---|---|---|
| Male header with straight solder pins, kinked<br>Length: 2.9 mm | 6 | 09 18 506 ⌴ 024 | 09 18 506 ⌴ 014 | 09 18 506 ⌴ 004 |
| | 10 | 09 18 510 ⌴ 024 | 09 18 510 ⌴ 014 | 09 18 510 ⌴ 004 |
| | 14 | 09 18 514 ⌴ 024 | 09 18 514 ⌴ 014 | 09 18 514 ⌴ 004 |
| | 16 | 09 18 516 ⌴ 024 | 09 18 516 ⌴ 014 | 09 18 516 ⌴ 004 |
| | 20 | 09 18 520 ⌴ 024 | 09 18 520 ⌴ 014 | 09 18 520 ⌴ 004 |
| | 24 | 09 18 524 ⌴ 024 | 09 18 524 ⌴ 014 | 09 18 524 ⌴ 004 |
| | 26 | 09 18 526 ⌴ 024 | 09 18 526 ⌴ 014 | 09 18 526 ⌴ 004 |
| | 30 | 09 18 530 ⌴ 024 | 09 18 530 ⌴ 014 | 09 18 530 ⌴ 004 |
| | 34 | 09 18 534 ⌴ 024 | 09 18 534 ⌴ 014 | 09 18 534 ⌴ 004 |
| | 40 | 09 18 540 ⌴ 024 | 09 18 540 ⌴ 014 | 09 18 540 ⌴ 004 |
| | 50 | 09 18 550 ⌴ 024 | 09 18 550 ⌴ 014 | 09 18 550 ⌴ 004 |
| | 60 | 09 18 560 ⌴ 024 | 09 18 560 ⌴ 014 | 09 18 560 ⌴ 004 |
| | 64 | 09 18 564 ⌴ 024 | 09 18 564 ⌴ 014 | 09 18 564 ⌴ 004 |





* Not normally kept in stock
For accessories see page 08.16
For dimensions see page 08.11

For performance level 3 please specify digit 7 *
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5 *

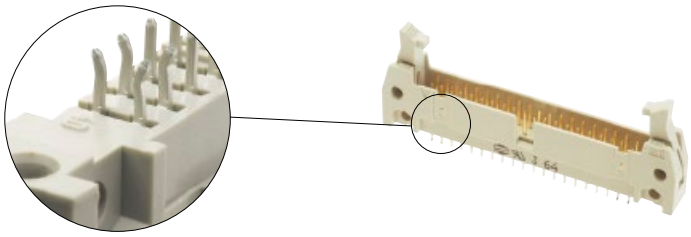
7 6 5 *

7 6 5 *

Downloaded from Arrow.com.

Number of contacts

# 6–64

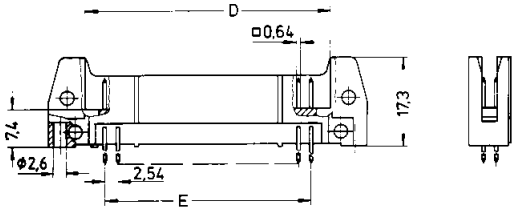


## Male header with straight solder pins, kinked

| Identification | Drawing | Dimensions in mm |
|---|---|---|

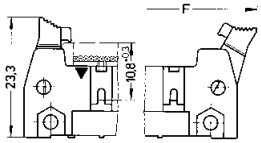
### Male header

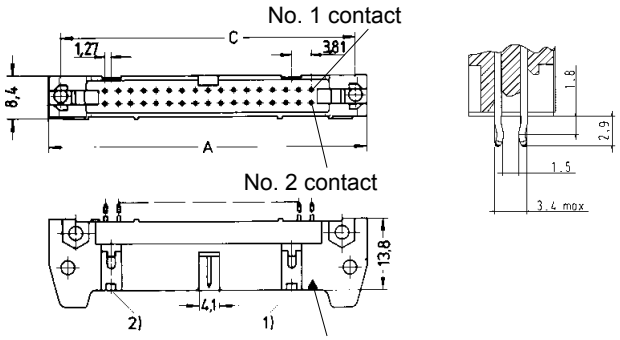
| No. of contacts | A | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 | 26.9 | 22.86 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 27.94 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 33.02 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 35.56 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 40.64 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 45.72 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 48.26 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 53.34 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 58.42 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 66.04 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 78.74 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 91.44 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 96.52 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |




Short levers

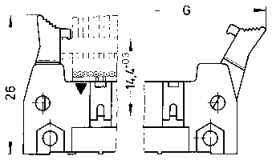
for use with female connector without strain relief clamp



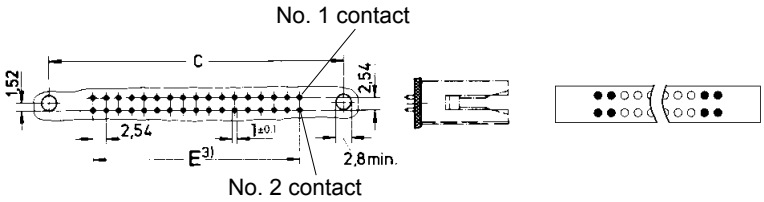




Long levers

for use with female connector with strain relief clamp




### Board drillings




● Kinked contact: pcb thickness from 1.50 to 1.94 mm after Cu + Sn plating with non-remelted through holes ø 0.80 to ø 0.95 mm. Max. insertion force = 125 N. Min. retention force = 3 N.

○ Non-kinked contact: Solder pins for pcb connections ø 1 ± 0.1 mm as per IEC 60603-13.

For accessories see page 08.16

1) No polarization slot for 6, 10 or 14 way male header

2) No polarization slot for 6 way male header

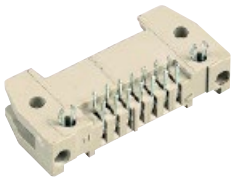
3) Pitch tolerance: ± 0.1



Downloaded from Arrow.com.

Number of contacts

# 6–64



## Male header with angled solder pins and board lock

| Identification | No. of contacts | Part number Without levers | With short levers | With long levers |
|---|---|---|---|---|
| **Male header with angled solder pins and pcb board lock**<br>Length: 2.9 mm<br>for 1.6 mm pcb thickness | 6 | 09 18 506 ⌴ 973* | 09 18 506 ⌴ 963* | 09 18 506 ⌴ 953* |
| | 10 | 09 18 510 ⌴ 973* | 09 18 510 ⌴ 963* | 09 18 510 ⌴ 953* |
| | 14 | 09 18 514 ⌴ 973* | 09 18 514 ⌴ 963* | 09 18 514 ⌴ 953* |
| | 16 | 09 18 516 ⌴ 973* | 09 18 516 ⌴ 963* | 09 18 516 ⌴ 953* |
| | 20 | 09 18 520 ⌴ 973* | 09 18 520 ⌴ 963* | 09 18 520 ⌴ 953* |
| To hold the connector on the pcb before the soldering process, two board locks have been added on the male header with angled solder pins. | 24 | 09 18 524 ⌴ 973* | 09 18 524 ⌴ 963* | 09 18 524 ⌴ 953* |
| | 26 | 09 18 526 ⌴ 973* | 09 18 526 ⌴ 963* | 09 18 526 ⌴ 953* |
| | 30 | 09 18 530 ⌴ 973* | 09 18 530 ⌴ 963* | 09 18 530 ⌴ 953* |
| | 34 | 09 18 534 ⌴ 973* | 09 18 534 ⌴ 963* | 09 18 534 ⌴ 953* |
| | 40 | 09 18 540 ⌴ 973* | 09 18 540 ⌴ 963* | 09 18 540 ⌴ 953* |
| | 50 | 09 18 550 ⌴ 973* | 09 18 550 ⌴ 963* | 09 18 550 ⌴ 953* |
| | 60 | 09 18 560 ⌴ 973* | 09 18 560 ⌴ 963* | 09 18 560 ⌴ 953* |
| | 64 | 09 18 564 ⌴ 973* | 09 18 564 ⌴ 963* | 09 18 564 ⌴ 953* |

* Not normally kept in stock

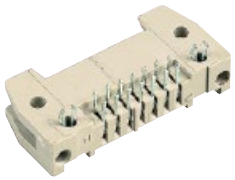
For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5



Downloaded from Arrow.com.

Number of contacts

# 6–64

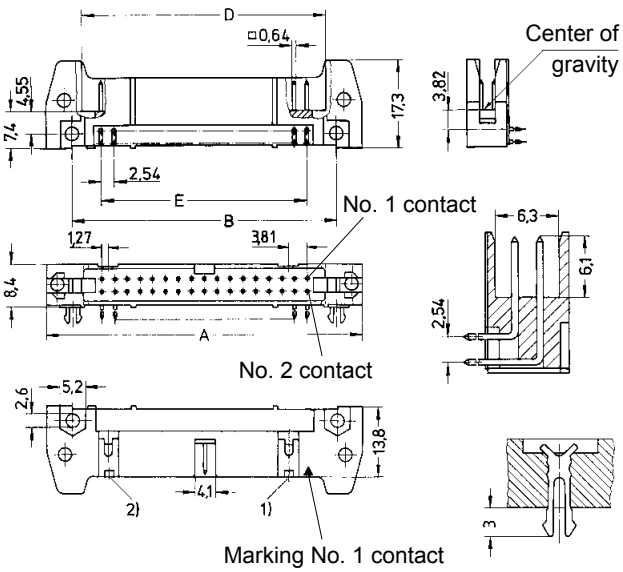


## Male header with angled solder pins and board lock

Identification | Drawing | Dimensions in mm

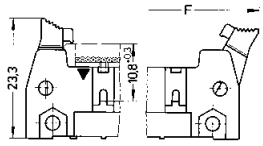
### Male header

| No. of contacts | A | B | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 | 26.9 | 16.76 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 21.84 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 26.92 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 29.46 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 34.54 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 39.62 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 42.16 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 47.24 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 52.32 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 59.94 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 72.64 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 85.34 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 90.42 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |



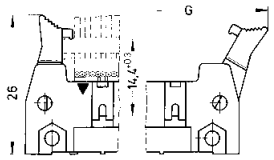

**Short levers**

for use with female connector without strain relief clamp

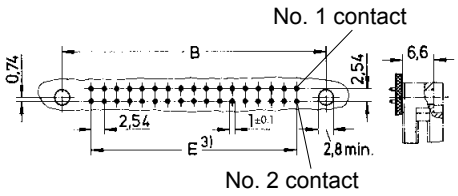



**Long levers**

for use with female connector with strain relief clamp




### Board drillings




For accessories see page 08.16

1) No polarization slot for 6, 10 or 14 way male header

2) No polarization slot for 6 way male header

3) Pitch tolerance: ± 0.1



Downloaded from Arrow.com.

Number of contacts

# 6–64

## Low-profile male header, angled solder pins

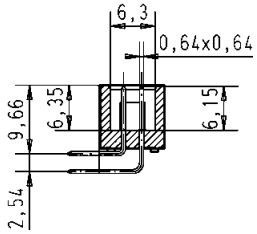
| Identification | No. of contacts | Part number |
|---|---|---|
| **Male header with angled solder pins** | | |
| Length: 2.9 mm | 6 | 09 18 506 ⌴ 323 |
| | 10 | 09 18 510 ⌴ 323 |
| | 14 | 09 18 514 ⌴ 323 |
| | 16 | 09 18 516 ⌴ 323 |
| | 20 | 09 18 520 ⌴ 323 |
| | 26 | 09 18 526 ⌴ 323 |
| | 30 | 09 18 530 ⌴ 323 |
| | 34 | 09 18 534 ⌴ 323 |
| | 40 | 09 18 540 ⌴ 323 |
| | 50 | 09 18 550 ⌴ 323 |
| | 60 | 09 18 560 ⌴ 323 |
| | 64 | 09 18 564 ⌴ 323 |

For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5 *

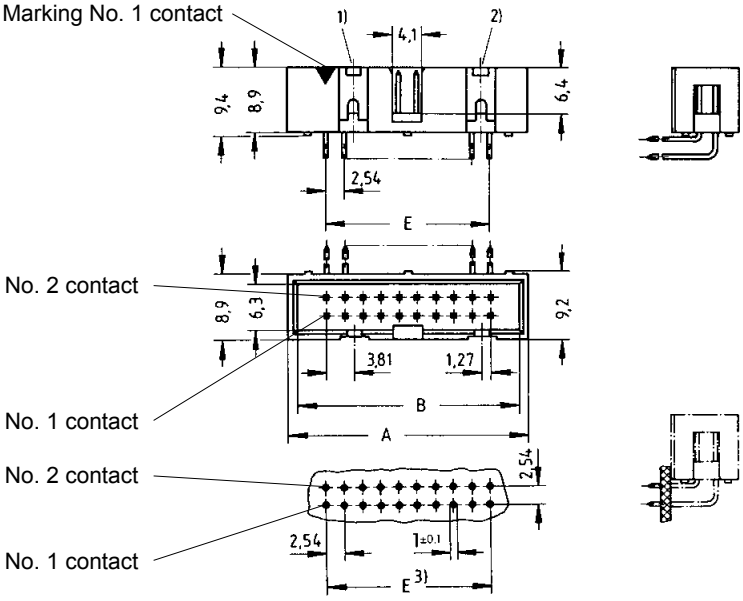
Drawing

| No. of contacts | A | B | E |
|---|---|---|---|
| 6 | 15.2 | 12.78 | 2.54 x 2 = 5.08 |
| 10 | 20.3 | 17.86 | 2.54 x 4 = 10.16 |
| 14 | 25.4 | 22.94 | 2.54 x 6 = 15.24 |
| 16 | 27.9 | 25.48 | 2.54 x 7 = 17.78 |
| 20 | 33.0 | 30.56 | 2.54 x 9 = 22.86 |
| 26 | 40.6 | 38.18 | 2.54 x 12 = 30.48 |
| 30 | 45.72 | 43.26 | 2.54 x 14 = 35.56 |
| 34 | 50.8 | 48.34 | 2.54 x 16 = 40.64 |
| 40 | 58.4 | 55.96 | 2.54 x 19 = 48.26 |
| 50 | 71.3 | 68.66 | 2.54 x 24 = 60.96 |
| 60 | 84.0 | 81.36 | 2.54 x 29 = 73.66 |
| 64 | 89.1 | 86.44 | 2.54 x 31 = 78.74 |

Dimensions in mm

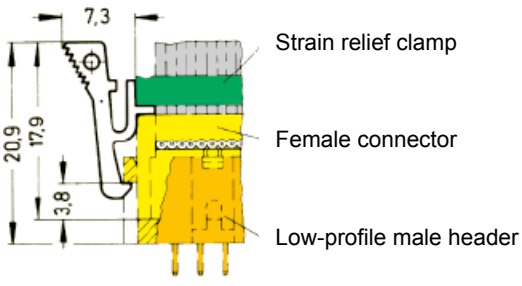



Solder pins for 1 ± 0.1 mm dia. hole




| Identification | Part number |
|---|---|
| **Locking lever for female connector with strain relief** | |
| in conjunction with low-profile male header | 09 18 000 9905 4) |
| When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector. | |

Drawing




Dimensions in mm

* Not normally kept in stock

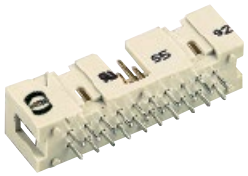
1) No polarization slot for 6, 10 or 14 way male header
2) No polarization slot for 6 way male header
3) Pitch tolerance: ± 0.1
4) Order 2 per female connector



Downloaded from Arrow.com.

Number of contacts

# 6–64



## Low-profile male header, straight solder pins

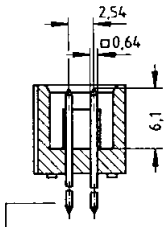
| Identification | No. of contacts | Part number |
|---|---|---|
| **Male header with straight solder pins**<br>Length: 2.9 mm | 6 | 09 18 506 ⌴ 324 |
| | 10 | 09 18 510 ⌴ 324 |
| | 14 | 09 18 514 ⌴ 324 |
| | 16 | 09 18 516 ⌴ 324 |
| | 20 | 09 18 520 ⌴ 324 |
| | 26 | 09 18 526 ⌴ 324 |
| | 30 | 09 18 530 ⌴ 324 |
| | 34 | 09 18 534 ⌴ 324 |
| | 40 | 09 18 540 ⌴ 324 |
| | 50 | 09 18 550 ⌴ 324 |
| | 60 | 09 18 560 ⌴ 324 |
| | 64 | 09 18 564 ⌴ 324 |
| **Male header with straight solder pins**<br>Length: 4.5 mm | 6 | 09 18 506 ⌴ 322* |
| | 10 | 09 18 510 ⌴ 322* |
| | 14 | 09 18 514 ⌴ 322* |
| | 16 | 09 18 516 ⌴ 322* |
| | 20 | 09 18 520 ⌴ 322* |
| | 26 | 09 18 526 ⌴ 322* |
| | 30 | 09 18 530 ⌴ 322* |
| | 34 | 09 18 534 ⌴ 322* |
| | 40 | 09 18 540 ⌴ 322* |
| | 50 | 09 18 550 ⌴ 322* |
| | 60 | 09 18 560 ⌴ 322* |
| | 64 | 09 18 564 ⌴ 322* |

For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5 *

Drawing

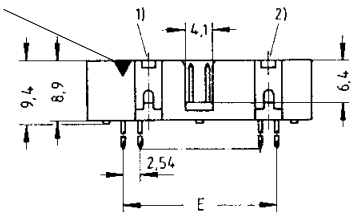
| No. of contacts | A | B | E |
|---|---|---|---|
| 6 | 15.2 | 12.78 | 2.54 x 2 = 5.08 |
| 10 | 20.3 | 17.86 | 2.54 x 4 = 10.16 |
| 14 | 25.4 | 22.94 | 2.54 x 6 = 15.24 |
| 16 | 27.9 | 25.48 | 2.54 x 7 = 17.78 |
| 20 | 33.0 | 30.56 | 2.54 x 9 = 22.86 |
| 26 | 40.6 | 38.18 | 2.54 x 12 = 30.48 |
| 30 | 45.72 | 43.26 | 2.54 x 14 = 35.56 |
| 34 | 50.8 | 48.34 | 2.54 x 16 = 40.64 |
| 40 | 58.4 | 55.96 | 2.54 x 19 = 48.26 |
| 50 | 71.3 | 68.66 | 2.54 x 24 = 60.96 |
| 60 | 84.0 | 81.36 | 2.54 x 29 = 73.66 |
| 64 | 89.1 | 86.44 | 2.54 x 31 = 78.74 |

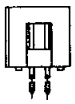
Dimensions in mm




Solder pins for
1 ± 0.1 mm dia. hole

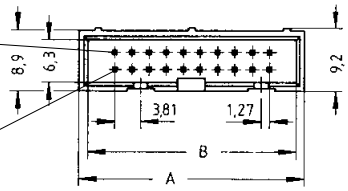
Marking No. 1 contact



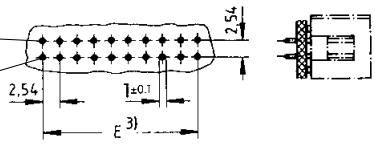
No. 2 contact

No. 1 contact



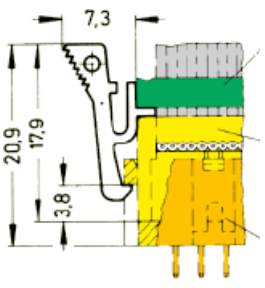

No. 2 contact

No. 1 contact




| Identification | Part number |
|---|---|
| **Locking lever for female connector with strain relief**<br>in conjunction with low-profile male header<br><br>When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector. | 09 18 000 9905[4] |

Drawing




Strain relief clamp

Female connector

Low-profile male header

Dimensions in mm

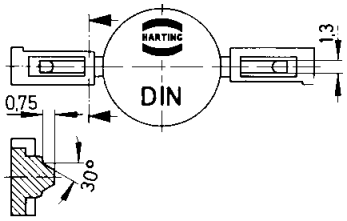
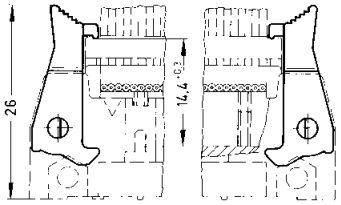
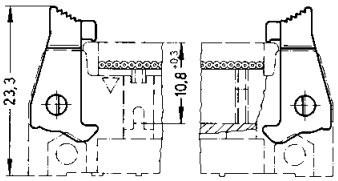
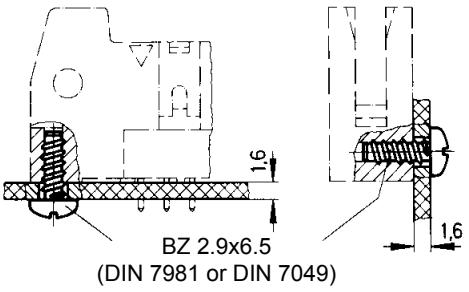
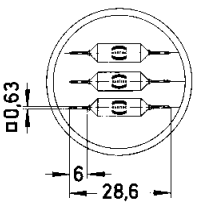
* Not normally kept in stock

1) No polarization slot for 6, 10 or 14 way male header
2) No polarization slot for 6 way male header
3) Pitch tolerance: ± 0.1
4) Order 2 per female connector



Downloaded from Arrow.com.

## Accessories

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Polarization key**<br><br>1) Part number comprises 2 keys | 09 18 500 9902[1)] |  | |
| **Locking lever**<br>(snaps into place, can be fitted whenever required)<br><br>2) Order 2 per male header | Long:<br>09 18 000 9903[2)]<br><br>Short:<br>09 18 000 9904[2)] | Long<br>  <br>For use with female connector with strain relief clamp<br><br>Short<br>  <br>For use with female connector without strain relief clamp | |
| **Fixing screws**<br>for 1.6 mm P.C. board<br><br>3) Part number comprises 50 pieces | 09 18 000 9906[3)] |  <br>BZ 2.9x6.5<br>(DIN 7981 or DIN 7049) | For connectors with part numbers<br>09 18 5xx x9xx: screwing torque 0.2 Nm<br>09 19 5xx x9xx: screwing torque 0.4 – 0.5 Nm<br><br>Screw material: Steel (Inox A2)<br><br>Plating: Nickel |
| **Coding system with loss of contact**<br><br>4) Part number comprises 6 code pins | Code pin<br>09 18 000 9901[4)]<br><br>Removal tool for male contacts<br>09 99 000 0133 | To avoid cross-plugging adjacent connectors a coding system is required.<br>A code pin is inserted into the appropriate cavity in the female connector.<br>The corresponding male contact is removed by a special removal tool.<br><br>  <br> | |



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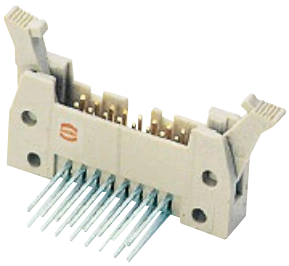
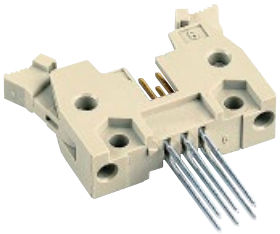
| | |
|---|---|
| Number of contacts | 6, 10, 14, 16, 20, 24, 26, 30, 34, 40, 50, 60, 64 |
| Contact arrangement | straight, angled |
| Contact length | 15 mm |
| Approvals | IEC 60603-13<br>DIN EN 60603-13<br>D 2632<br>BT 224<br>NFC 93-428 (HE 10) |
| Pitch | 2.54 mm [0.100“] |
| Working current | 1 A |
| Working voltage | 500 V<br>for pollution degree 1 |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Contact resistance<br>Insulation resistance | ≤ 20 mΩ<br>≥ $10^9$ Ω |
| Temperature range | -55 °C … +125 °C<br>The maximum temperature includes heating of contacts and ambient temperature |
| Terminations | 0.6 mm x 0.6 mm<br>Diagonal: 0.86 mm |
| Materials<br>Moulding | <br>Thermoplastic resin (PBT)<br>UL 94-V0 |
| Contact surface<br>Contact zone | <br>plated according to performance level[1)] |





SEK



[1)] Performance level 3 as per IEC 60603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60603-13, ≥ 250 mating cycles, 4 days gas test
S4, plating = 0.76 µm (30 µinch) Au or PdNi eqivalent

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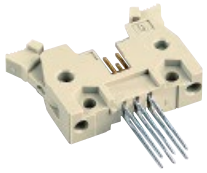
Number of contacts

# 6–64



## Male header with wrap posts

| Identification | No. of contacts | Part number<br>Without levers | <br>With short levers | <br>With long levers |
|---|---|---|---|---|
| **Male header with angled wrap posts**<br>Length: 15 mm<br>☐ 0.6 mm | 6 | 09 18 506 ⌴ 926* | 09 18 506 ⌴ 916* | 09 18 506 ⌴ 906* |
| | 10 | 09 18 510 ⌴ 926* | 09 18 510 ⌴ 916* | 09 18 510 ⌴ 906* |
| | 14 | 09 18 514 ⌴ 926* | 09 18 514 ⌴ 916* | 09 18 514 ⌴ 906* |
| | 16 | 09 18 516 ⌴ 926* | 09 18 516 ⌴ 916* | 09 18 516 ⌴ 906* |
| | 20 | 09 18 520 ⌴ 926* | 09 18 520 ⌴ 916* | 09 18 520 ⌴ 906* |
| | 24 | 09 18 524 ⌴ 926* | 09 18 524 ⌴ 916* | 09 18 524 ⌴ 906* |
| | 26 | 09 18 526 ⌴ 926* | 09 18 526 ⌴ 916* | 09 18 526 ⌴ 906* |
| | 30 | 09 18 530 ⌴ 926* | 09 18 530 ⌴ 916* | 09 18 530 ⌴ 906* |
| | 34 | 09 18 534 ⌴ 926* | 09 18 534 ⌴ 916* | 09 18 534 ⌴ 906* |
| | 40 | 09 18 540 ⌴ 926* | 09 18 540 ⌴ 916* | 09 18 540 ⌴ 906* |
| | 50 | 09 18 550 ⌴ 926* | 09 18 550 ⌴ 916* | 09 18 550 ⌴ 906* |
| | 60 | 09 18 560 ⌴ 926* | 09 18 560 ⌴ 916* | 09 18 560 ⌴ 906* |
| | 64 | 09 18 564 ⌴ 926* | 09 18 564 ⌴ 916* | 09 18 564 ⌴ 906* |
| **Male header with straight wrap posts**<br>Length: 15 mm<br>☐ 0.6 mm | 6 | 09 18 506 ⌴ 927* | 09 18 506 ⌴ 917* | 09 18 506 ⌴ 907* |
| | 10 | 09 18 510 ⌴ 927* | 09 18 510 ⌴ 917* | 09 18 510 ⌴ 907* |
| | 14 | 09 18 514 ⌴ 927* | 09 18 514 ⌴ 917* | 09 18 514 ⌴ 907* |
| | 16 | 09 18 516 ⌴ 927* | 09 18 516 ⌴ 917* | 09 18 516 ⌴ 907* |
| | 20 | 09 18 520 ⌴ 927* | 09 18 520 ⌴ 917* | 09 18 520 ⌴ 907* |
| | 24 | 09 18 524 ⌴ 927* | 09 18 524 ⌴ 917* | 09 18 524 ⌴ 907* |
| | 26 | 09 18 526 ⌴ 927* | 09 18 526 ⌴ 917* | 09 18 526 ⌴ 907* |
| | 30 | 09 18 530 ⌴ 927* | 09 18 530 ⌴ 917* | 09 18 530 ⌴ 907* |
| | 34 | 09 18 534 ⌴ 927* | 09 18 534 ⌴ 917* | 09 18 534 ⌴ 907* |
| | 40 | 09 18 540 ⌴ 927* | 09 18 540 ⌴ 917* | 09 18 540 ⌴ 907* |
| | 50 | 09 18 550 ⌴ 927* | 09 18 550 ⌴ 917* | 09 18 550 ⌴ 907* |
| | 60 | 09 18 560 ⌴ 927* | 09 18 560 ⌴ 917* | 09 18 560 ⌴ 907* |
| | 64 | 09 18 564 ⌴ 927* | 09 18 564 ⌴ 917* | 09 18 564 ⌴ 907* |

* Not normally kept in stock
For accessories see page 08.20
For dimensions see page 08.19

For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5



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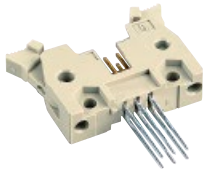
Number of contacts

# 6–64



## Male header with wrap posts

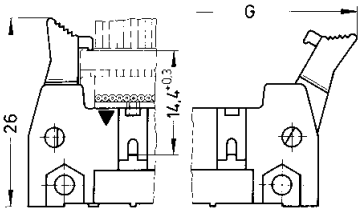
Identification | Drawing | Dimensions in mm

### Male header

| No. of contacts | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 6 | 26.9 | 16.76 | 22.86 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 21.84 | 27.94 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 26.92 | 33.02 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 29.46 | 35.56 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 34.54 | 40.64 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 39.62 | 45.72 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 42.16 | 48.26 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 47.24 | 53.43 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 52.32 | 58.42 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 59.94 | 66.04 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 72.64 | 78.74 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 85.34 | 91.44 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 90.42 | 96.52 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |

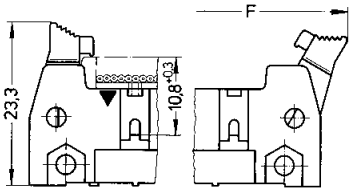
#### Long levers

for use with female connector with strain relief clamp

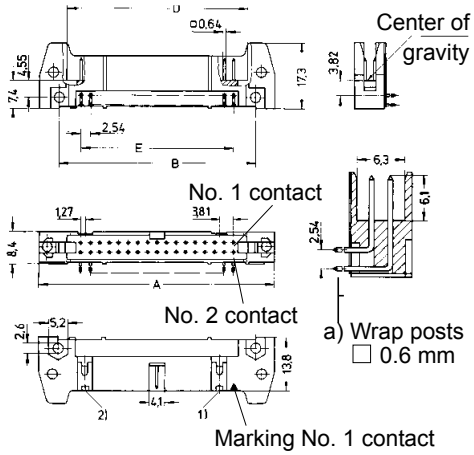



#### Short levers

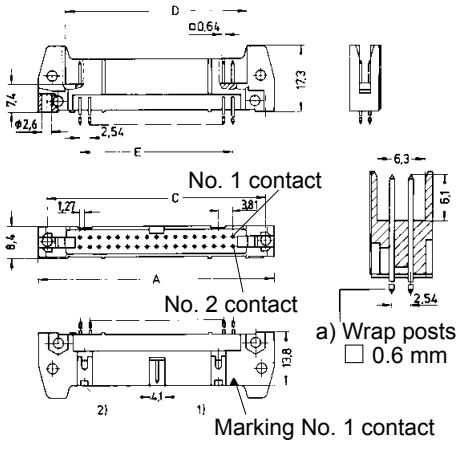
for use with female connector without strain relief clamp



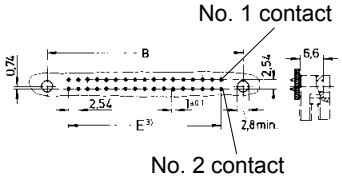

#### Angled versions

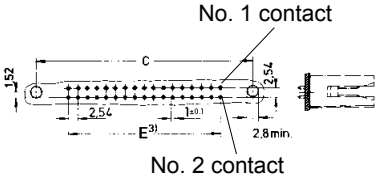



#### Straight versions




### Board drillings




For accessories see page 08.20

[1] No polarization slot for 6, 10 or 14 way male header

[2] No polarization slot for 6 way male header

[3] Pitch tolerance: ± 0.1



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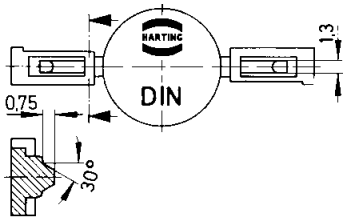
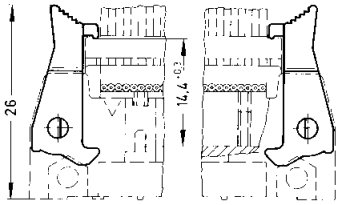
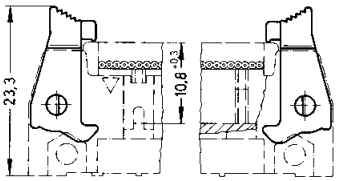
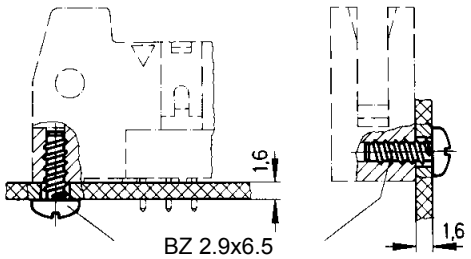
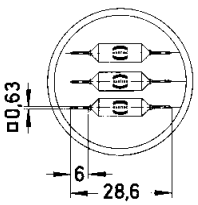
## Accessories

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Polarization key**<br><br>1) Part number comprises 2 keys | 09 18 500 9902[1] |  | |
| **Locking lever**<br>(snaps into place, can be fitted whenever required)<br><br>2) Order 2 per male header | Long:<br>09 18 000 9903[2]<br><br>Short:<br>09 18 000 9904[2] | Long<br>  <br>For use with female connector with strain relief clamp<br><br>Short<br>  <br>For use with female connector without strain relief clamp | |
| **Fixing screws**<br>for 1.6 mm P.C. board<br><br>3) Part number comprises 50 pieces | 09 18 000 9906[3] |  <br>BZ 2.9x6.5<br>(DIN 7981 or DIN 7049) | For connectors with part numbers<br>09 18 5xx x9xx: screwing torque 0.2 Nm<br>09 19 5xx x9xx: screwing torque 0.4 – 0.5 Nm<br><br>Screw material: Steel (Inox A2)<br><br>Plating: Nickel |
| **Coding system with loss of contact**<br><br>4) Part number comprises 6 code pins | Code pin<br><br>09 18 000 9901[4]<br><br>Removal tool for male contacts<br><br>09 99 000 0133 | To avoid cross-plugging adjacent connectors a coding system is required.<br>A code pin is inserted into the appropriate cavity in the female connector.<br>The corresponding male contact is removed by a special removal tool.<br><br>  <br><br> | |



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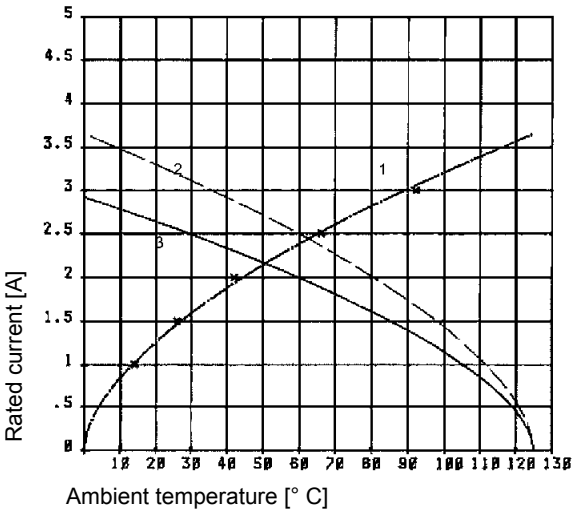
| | |
|---|---|
| Number of contacts | 6, 10, 14, 16, 20, 24, 26, 30, 34, 40, 50, 60, 64 |
| Approvals | IEC 60603-13<br>DIN EN 60603-13<br>D 2632<br>BT 224<br>NFC 93-428 (HE 10)<br><br>UL recognized: E102079 |
| Pitch | On pcb side: 2.54 mm [0.100“]<br>On cable side: 1.27 mm [0.050“] |
| Rated current | 2.5 A min. at ambient temperature of 30 °C |
| Working voltage | 320 V<br>for pollution degree 1 |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Contact resistance<br>Insulation resistance | ≤ 20 mΩ<br>≥ $10^9$ Ω |
| Temperature range | -55 °C … +125 °C<br>The maximum temperature includes heating of contacts and ambient temperature |
| Terminations | IDC flat cable<br>1.27 mm [0.050”] pitch:<br>AWG 26/7 – AWG 28/7 |
| Materials<br>Moulding | <br>Thermoplastic resin (PBT) UL 94-V0 |
| Contact surface<br>Contact zone | <br>gold-plated according to performance level[1)] |

## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.
The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to IEC 60512.




Example: 50 way connector
① Temperature rise
② Derating
③ Derating curve at $I_{max.}$ x 0.8 (IEC 60512-2)

## Insertion and withdrawal forces

| Number of contacts | Maximum force [N] | |
|---|---|---|
| | Performance level 1 and 2 | Performance level 3 |
| 6 | 12 | 18 |
| 10 | 20 | 30 |
| 14 | 28 | 42 |
| 16 | 32 | 48 |
| 20 | 40 | 60 |
| 24 | 48 | 72 |
| 26 | 52 | 78 |
| 30 | 60 | 90 |
| 34 | 68 | 102 |
| 40 | 80 | 120 |
| 50 | 100 | 150 |
| 60 | 120 | 180 |
| 64 | 128 | 192 |

[1)] Performance level 3 as per IEC 60603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60603-13, ≥ 250 mating cycles, 4 days gas test
S4, plating = 0.76 µm (30 µinch) Au or PdNi eqivalent



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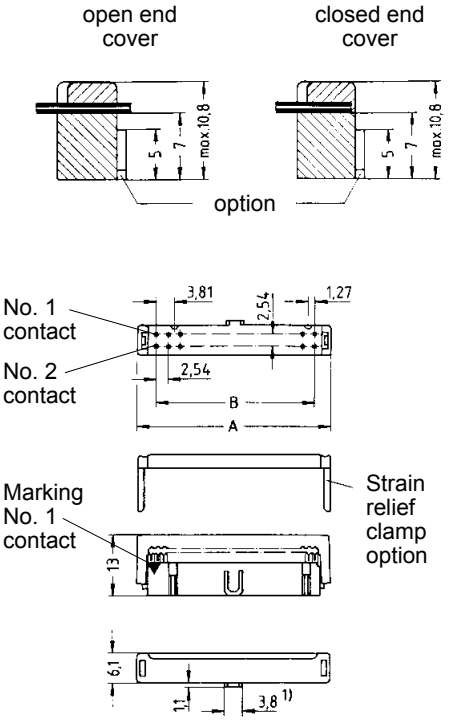
Number of contacts

# 6–64

## Female connector

| Identification | No. of contacts | Part number open end cover | Part number closed end cover |
|---|---|---|---|
| **Female connector with central polarization** | | | |
| without strain relief clamp | 6 | 09 18 506 ⌴ 803 | 09 18 506 ⌴ 804 |
| | 10 | 09 18 510 ⌴ 803 | 09 18 510 ⌴ 804 |
| | 14 | 09 18 514 ⌴ 803 | 09 18 514 ⌴ 804 |
| | 16 | 09 18 516 ⌴ 803 | 09 18 516 ⌴ 804 |
| | 20 | 09 18 520 ⌴ 803 | 09 18 520 ⌴ 804 |
| | 24 | 09 18 524 ⌴ 803 | |
| | 26 | 09 18 526 ⌴ 803 | 09 18 526 ⌴ 804 |
| | 30 | 09 18 530 ⌴ 803 | 09 18 530 ⌴ 804 |
| | 34 | 09 18 534 ⌴ 803 | 09 18 534 ⌴ 804 |
| | 40 | 09 18 540 ⌴ 803 | 09 18 540 ⌴ 804 |
| | 50 | 09 18 550 ⌴ 803 | 09 18 550 ⌴ 804 |
| | 60 | 09 18 560 ⌴ 803 | 09 18 560 ⌴ 804 |
| | 64 | 09 18 564 ⌴ 803 | 09 18 564 ⌴ 804 |
| without strain relief clamp with bulk packaging | 6 | 09 18 506 ⌴ 803 58U[2] | |
| | 10 | 09 18 510 ⌴ 803 58U[2] | |
| | 14 | 09 18 514 ⌴ 803 58U[2] | |
| | 16 | 09 18 516 ⌴ 803 58U[2] | |
| | 20 | 09 18 520 ⌴ 803 58U[2] | |
| | 26 | 09 18 526 ⌴ 803 58U[2] | |
| | 30 | 09 18 530 ⌴ 803 58U[2] | |
| | 34 | 09 18 534 ⌴ 803 58U[3] | |
| | 40 | 09 18 540 ⌴ 803 58U[3] | |
| with strain relief clamp | 6 | 09 18 506 ⌴ 813 | 09 18 506 ⌴ 814* |
| | 10 | 09 18 510 ⌴ 813 | 09 18 510 ⌴ 814* |
| | 14 | 09 18 514 ⌴ 813 | 09 18 514 ⌴ 814* |
| | 16 | 09 18 516 ⌴ 813 | 09 18 516 ⌴ 814* |
| | 20 | 09 18 520 ⌴ 813 | 09 18 520 ⌴ 814* |
| | 24 | 09 18 524 ⌴ 813 | |
| | 26 | 09 18 526 ⌴ 813 | 09 18 526 ⌴ 814* |
| | 30 | 09 18 530 ⌴ 813 | 09 18 530 ⌴ 814* |
| | 34 | 09 18 534 ⌴ 813 | 09 18 534 ⌴ 814* |
| | 40 | 09 18 540 ⌴ 813 | 09 18 540 ⌴ 814* |
| | 50 | 09 18 550 ⌴ 813 | 09 18 550 ⌴ 814* |
| | 60 | 09 18 560 ⌴ 813 | 09 18 560 ⌴ 814* |
| | 64 | 09 18 564 ⌴ 813 | 09 18 564 ⌴ 814* |
| with strain relief clamp with bulk packaging | 6 | 09 18 506 ⌴ 813 58U[3] | |
| | 10 | 09 18 510 ⌴ 813 58U[3] | |
| | 14 | 09 18 514 ⌴ 813 58U[4] | |
| | 16 | 09 18 516 ⌴ 813 58U[4] | |
| | 20 | 09 18 520 ⌴ 813 58U[5] | |
| | 26 | 09 18 526 ⌴ 813 58U[6] | |
| | 30 | 09 18 530 ⌴ 813 58U[5] | |
| | 34 | 09 18 534 ⌴ 813 58U[7] | |
| | 40 | 09 18 540 ⌴ 813 58U[7] | |

Drawing — Dimensions in mm




| No. of contacts | 6 | 10 | 14 | 16 | 20 |
|---|---|---|---|---|---|
| A | 12.20 | 17.30 | 22.40 | 24.90 | 30.00 |
| B | 5.08 | 10.16 | 15.24 | 17.78 | 22.86 |

| No. of contacts | 24 | 26 | 30 | 34 | 40 |
|---|---|---|---|---|---|
| A | 35.18 | 37.60 | 42.70 | 47.80 | 55.40 |
| B | 27.94 | 30.48 | 35.56 | 40.64 | 48.26 |

| No. of contacts | 50 | 60 | 64 | | |
|---|---|---|---|---|---|
| A | 68.10 | 80.80 | 85.90 | | |
| B | 60.96 | 73.66 | 78.74 | | |

[2] Packaging unit (PU) 5,000 pieces
[3] PU 3,000 pieces
[3] Packaging unit (PU) 3,000 pieces
[4] PU 2,500 pieces
[5] PU 2,000 pieces
[6] PU 1,500 pieces
[7] PU 1,000 pieces

For performance level 3 please specify digit 7 6 5 *
For performance level 2 please specify digit 7 6 5 *
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent

[1] Pitch tolerance: ± 0.1
* Not normally kept in stock



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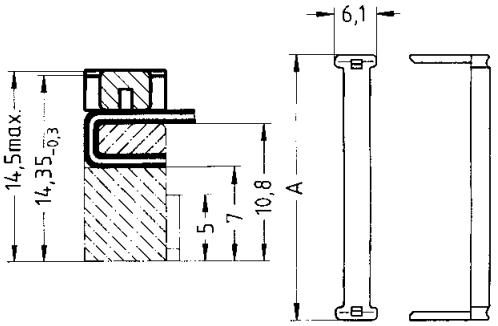
Number of contacts

# 6–64

## Strain relief clamp/Locking lever

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Strain relief clamp** | 6 | 09 18 506 9002 | | |
| | 10 | 09 18 510 9002 | | |
| | 14 | 09 18 514 9002 | | |
| | 16 | 09 18 516 9002 | | |
| | 20 | 09 18 520 9002 | | |
| | 24 | 09 18 524 9002 | | |
| | 26 | 09 18 526 9002 | | |
| | 30 | 09 18 530 9002 | | |
| | 34 | 09 18 534 9002 | | |
| | 40 | 09 18 540 9002 | | |
| | 50 | 09 18 550 9002 | | |
| | 60 | 09 18 560 9002 | | |
| | 64 | 09 18 564 9002 | | |
| with bulk packaging | 6 | 09 18 506 9002 58U[3)] | | |
| | 10 | 09 18 510 9002 58U[3)] | | |
| | 14 | 09 18 514 9002 58U[3)] | | |
| | 16 | 09 18 516 9002 58U[3)] | | |
| | 20 | 09 18 520 9002 58U[3)] | | |
| | 26 | 09 18 526 9002 58U[3)] | | |
| | 30 | 09 18 530 9002 58U[3)] | | |
| | 34 | 09 18 534 9002 58U[4)] | | |
| | 40 | 09 18 540 9002 58U[4)] | | |

| No. of contacts | A |
|---|---|
| 6 | 12.2 |
| 10 | 17.3 |
| 14 | 22.4 |
| 16 | 24.9 |
| 20 | 30.0 |
| 24 | 35.18 |
| 26 | 37.6 |
| 30 | 42.7 |
| 34 | 47.8 |
| 40 | 55.4 |
| 50 | 68.1 |
| 60 | 80.8 |
| 64 | 85.9 |

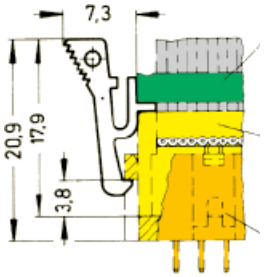



[3)] Packaging unit 5,000 pieces
[4)] Packaging unit 3,000 pieces

**Locking lever for female connector**

Only in conjunction with low-profile male header and strain relief

09 18 000 9905[1)5)]
09 18 000 9905 58U[1)6)]

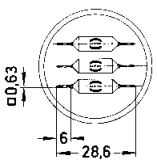



When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector. This can then be used in conjunction with male low-profile headers (see pages 08.14 and 08.15).

[5)] Packaging unit 100 pieces
[6)] Packaging unit 5,000 pieces

**Coding system with loss of contact**

Code pin — 09 18 000 9901[2)]




To avoid cross-plugging adjacent connectors a coding system is required. A code pin is inserted into the appropriate cavity in the female connector. The corresponding male contact is removed by a special removal tool.

Removal tool for male contacts — 09 99 000 0133

[1)] Order 2 per female connector
[2)] Part number comprises 6 code pins



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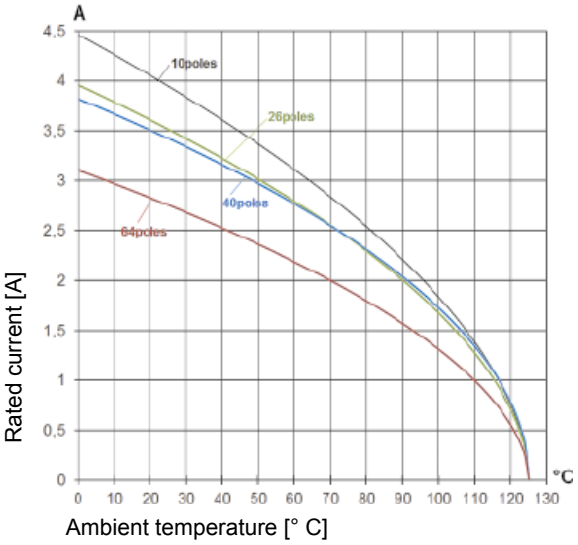
| | |
|---|---|
| Number of contacts | 4, 6, 8, 10, 14, 16, 20, 24, 26, 30, 34, 40, 50, 60, 64 |
| Approvals | UL recognized: E102079 |
| Pitch | On pcb side: 2.54 mm [0.100“]<br>On cable side: 1.27 mm [0.050“] |
| Rated current | 2.6 A min. at ambient temperature of 30 °C |
| Working voltage | 320 V<br>for pollution degree 1 |
| Test voltage $U_{r.m.s.}$ | 1 kV AC – 1 minute |
| Contact resistance<br>Insulation resistance | 35 mΩ max. mated<br>≥ $10^9$ Ω |
| Temperature range | -55 °C … +105 °C<br>The maximum temperature includes heating of contacts and ambient temperature |
| Terminations | Solder pins:<br>0.5 mm x 0.35 mm<br>Dimensions for pcb hole:<br>Standard version: Ø $0.8^{\pm 0.1}$ mm<br>Kinked version: Ø $0.85^{\pm 0.15}$ mm<br>Diagonal: 0.63 mm<br><br>IDC flat cable<br>1.27 mm [0.050“] pitch: AWG 28/7 |
| Materials | |
| Moulding | Thermoplastic resin (PBT)<br>UL 94-V0 |
| Contact | Copper alloy |

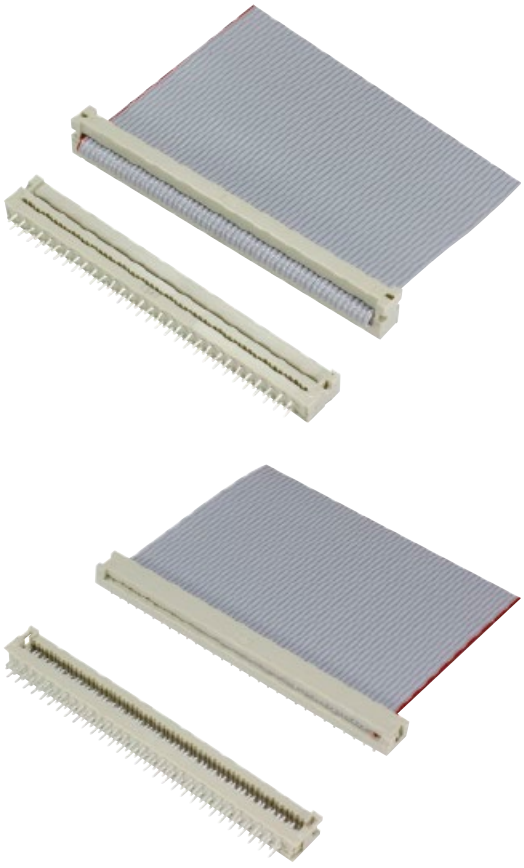
## Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.
The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to IEC 60 512.




Derating curve at $I_{max.}$ x 0.8 (IEC 60 512-2)





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Number of contacts

# 4–64

## Pcb transition connector,
## 2 rows with strain relief clamp, low-profile with 5.5 mm height

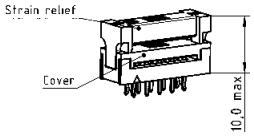
| Identification | No. of contacts | Part number |
|---|---|---|
| **Pcb transition connector**<br>2 rows<br>with strain relief clamp<br>Standard low-profile version | 4 | 09 18 104 9623* |
| | 6 | 09 18 106 9623* |
| | 8 | 09 18 108 9623* |
| | 10 | 09 18 110 9623* |
| | 14 | 09 18 114 9623* |
| | 16 | 09 18 116 9623* |
| | 20 | 09 18 120 9623* |
| | 24 | 09 18 124 9623* |
| | 26 | 09 18 126 9623* |
| | 30 | 09 18 130 9623* |
| | 34 | 09 18 134 9623* |
| | 40 | 09 18 140 9623 |
| | 50 | 09 18 150 9623* |
| | 60 | 09 18 160 9623 |
| | 64 | 09 18 164 9623* |
| **Pcb transition connector**<br>2 rows<br>with strain relief clamp<br>Kinked low-profile version<br>2 kinked pins at each extremity | 4 | 09 18 104 9423* |
| | 6 | 09 18 106 9423* |
| | 8 | 09 18 108 9423* |
| | 10 | 09 18 110 9423* |
| | 14 | 09 18 114 9423* |
| | 16 | 09 18 116 9423* |
| | 20 | 09 18 120 9423* |
| | 24 | 09 18 124 9423* |
| | 26 | 09 18 126 9423* |
| | 30 | 09 18 130 9423* |
| | 34 | 09 18 134 9423* |
| | 40 | 09 18 140 9423 |
| | 50 | 09 18 150 9423* |
| | 60 | 09 18 160 9423 |
| | 64 | 09 18 164 9423* |
| **Board drillings** | | |

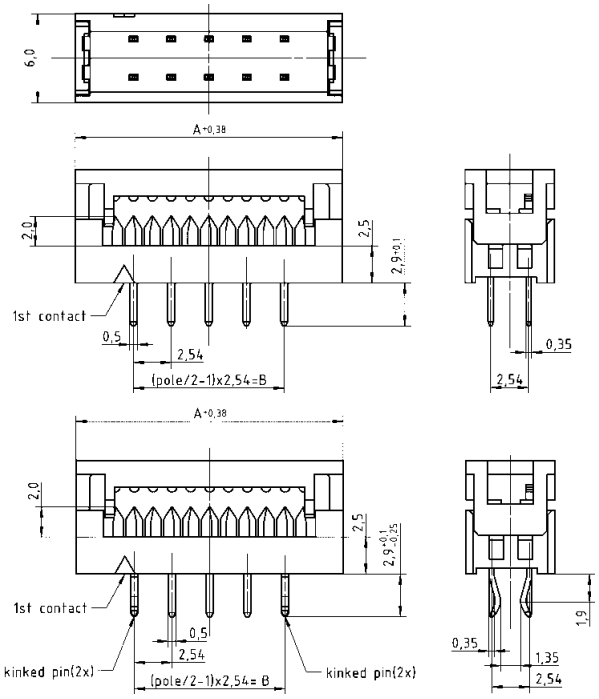
Drawing

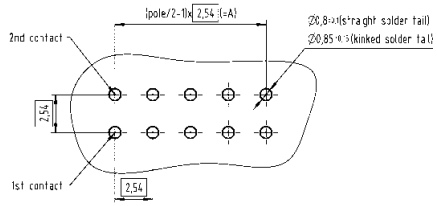
Dimensions in mm

| No. of contacts | $A^{\pm 0.38}$ | $B^{\pm 0.10}$ |
|---|---|---|
| 4 | 10.38 | 2.54 x 1 = 2.54 |
| 6 | 12.92 | 2.54 x 2 = 5.08 |
| 8 | 15.46 | 2.54 x 3 = 7.62 |
| 10 | 18.00 | 2.54 x 4 = 10.16 |
| 14 | 23.08 | 2.54 x 6 = 15.24 |
| 16 | 25.62 | 2.54 x 7 = 17.78 |
| 20 | 30.74 | 2.54 x 9 = 22.86 |
| 24 | 35.78 | 2.54 x 11 = 27.94 |
| 26 | 38.32 | 2.54 x 12 = 30.48 |
| 30 | 43.40 | 2.54 x 14 = 35.56 |
| 34 | 48.48 | 2.54 x 16 = 40.64 |
| 40 | 56.10 | 2.54 x 19 = 48.26 |
| 50 | 68.80 | 2.54 x 24 = 60.96 |
| 60 | 81.50 | 2.54 x 29 = 73.66 |
| 64 | 86.58 | 2.54 x 31 = 78.74 |

Assembled cover with strain relief

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* Available on request



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Number of contacts

# 4–64

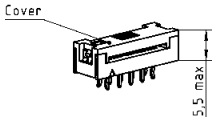
## Pcb transition connector,
## 2 rows without strain relief clamp, low-profile with 5.5 mm height

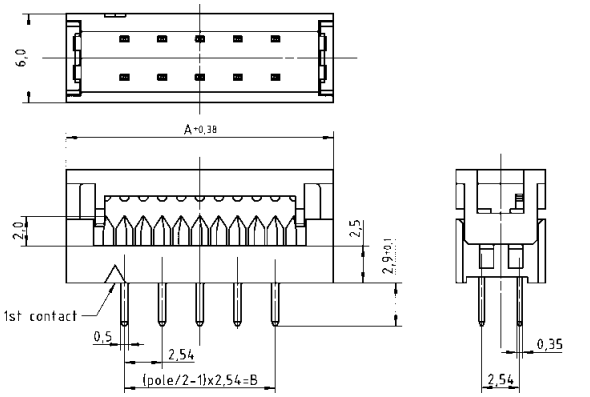
| Identification | No. of contacts | Part number |
|---|---|---|
| **Pcb transition connector**<br>2 rows without strain relief clamp<br>Standard low-profile version | 4 | 09 18 104 9622 |
| | 6 | 09 18 106 9622 |
| | 8 | 09 18 108 9622 |
| | 10 | 09 18 110 9622 |
| | 14 | 09 18 114 9622 |
| | 16 | 09 18 116 9622 |
| | 20 | 09 18 120 9622 |
| | 24 | 09 18 124 9622 |
| | 26 | 09 18 126 9622 |
| | 30 | 09 18 130 9622 |
| | 34 | 09 18 134 9622 |
| | 40 | 09 18 140 9622 |
| | 50 | 09 18 150 9622 |
| | 60 | 09 18 160 9622 |
| | 64 | 09 18 164 9622 |
| **Pcb transition connector**<br>2 rows without strain relief clamp<br>Kinked low-profile version<br>2 kinked pins at each extremity | 4 | 09 18 104 9422 |
| | 6 | 09 18 106 9422 |
| | 8 | 09 18 108 9422 |
| | 10 | 09 18 110 9422 |
| | 14 | 09 18 114 9422 |
| | 16 | 09 18 116 9422 |
| | 20 | 09 18 120 9422 |
| | 24 | 09 18 124 9422 |
| | 26 | 09 18 126 9422 |
| | 30 | 09 18 130 9422 |
| | 34 | 09 18 134 9422 |
| | 40 | 09 18 140 9422 |
| | 50 | 09 18 150 9422 |
| | 60 | 09 18 160 9422 |
| | 64 | 09 18 164 9422 |
| **Board drillings** | | |

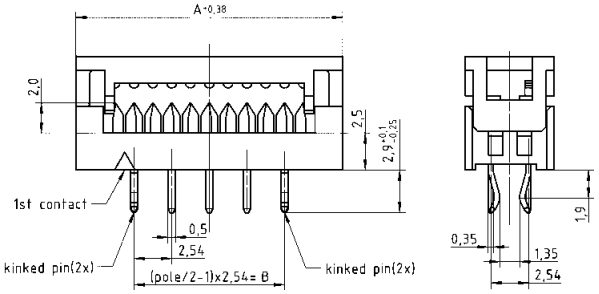
Drawing — Dimensions in mm

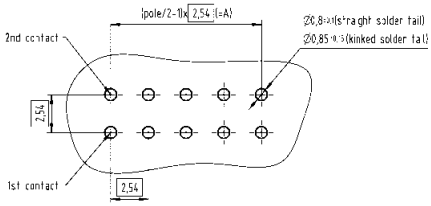
| No. of contacts | $A^{\pm 0.38}$ | $B^{\pm 0.10}$ |
|---|---|---|
| 4 | 10.38 | 2.54 x 1 = 2.54 |
| 6 | 12.92 | 2.54 x 2 = 5.08 |
| 8 | 15.46 | 2.54 x 3 = 7.62 |
| 10 | 18.00 | 2.54 x 4 = 10.16 |
| 14 | 23.08 | 2.54 x 6 = 15.24 |
| 16 | 25.62 | 2.54 x 7 = 17.78 |
| 20 | 30.74 | 2.54 x 9 = 22.86 |
| 24 | 35.78 | 2.54 x 11 = 27.94 |
| 26 | 38.32 | 2.54 x 12 = 30.48 |
| 30 | 43.40 | 2.54 x 14 = 35.56 |
| 34 | 48.48 | 2.54 x 16 = 40.64 |
| 40 | 56.10 | 2.54 x 19 = 48.26 |
| 50 | 68.80 | 2.54 x 24 = 60.96 |
| 60 | 81.50 | 2.54 x 29 = 73.66 |
| 64 | 86.58 | 2.54 x 31 = 78.74 |

Assembled cover without strain relief

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Number of contacts

# 4–64

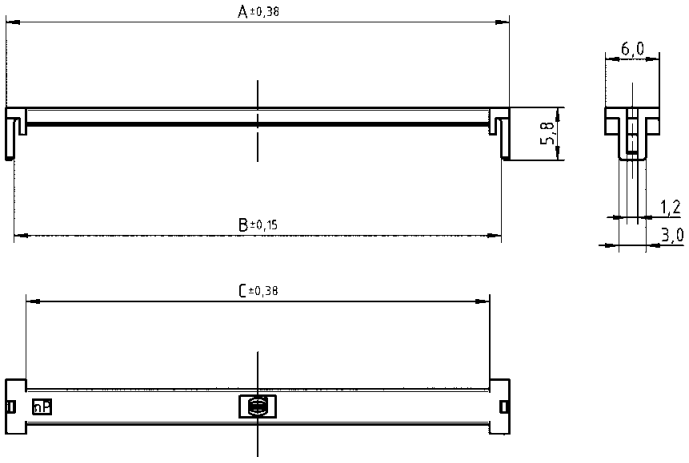
## Strain relief clamp

| Identification | No. of contacts | Part number |
|---|---|---|
| Strain relief clamp | 4 | 98 18 104 9002* |
| | 6 | 98 18 106 9002* |
| | 8 | 98 18 108 9002* |
| | 10 | 98 18 110 9002* |
| | 14 | 98 18 114 9002* |
| | 16 | 98 18 116 9002* |
| | 20 | 98 18 120 9002* |
| | 24 | 98 18 124 9002* |
| | 26 | 98 18 126 9002* |
| | 30 | 98 18 130 9002* |
| | 34 | 98 18 134 9002* |
| | 40 | 98 18 140 9002 |
| | 50 | 98 18 150 9002* |
| | 60 | 98 18 160 9002 |
| | 64 | 98 18 164 9002* |

Drawing

Dimensions in mm

| No. of contacts | A | B | C |
|---|---|---|---|
| 4 | 10.38 | 8.58 | 5.98 |
| 6 | 12.92 | 11.12 | 8.52 |
| 8 | 15.46 | 13.66 | 11.06 |
| 10 | 18.00 | 16.20 | 13.60 |
| 14 | 23.08 | 21.28 | 18.68 |
| 16 | 25.62 | 23.82 | 21.22 |
| 20 | 30.70 | 28.90 | 26.30 |
| 24 | 35.78 | 33.98 | 31.38 |
| 26 | 38.32 | 36.52 | 33.92 |
| 30 | 43.40 | 41.60 | 39.00 |
| 34 | 48.48 | 46.68 | 44.08 |
| 40 | 56.10 | 54.30 | 51.70 |
| 50 | 68.80 | 67.00 | 64.40 |
| 60 | 81.50 | 79.70 | 77.10 |
| 64 | 86.58 | 84.78 | 82.18 |




* Available on request



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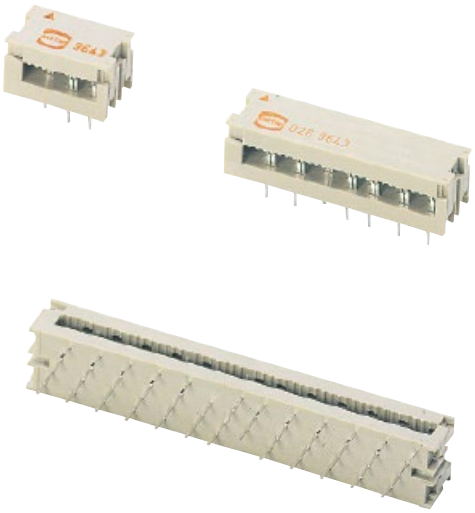
| | |
|---|---|
| Number of contacts* | 10, 16, 20, 26, 34, 40, 50 |
| Pitch | On pcb side: 2.54 mm [0.100“]<br>On cable side: 1.27 mm [0.050“] |
| Working current | 1 A |
| Test voltage $U_{r.m.s.}$ | 500 V |
| Contact resistance<br>Insulation resistance | ≤ 20 mΩ<br>≥ $10^{12}$ Ω |
| Temperature range | -40 °C … +125 °C<br>The maximum temperature includes heating of contacts and ambient temperature |
| Terminations | Solder pins<br>0.45 mm x 0.35 mm<br>for pcb hole Ø 0.8 mm<br>Diagonal: 0.58 mm<br>IDC flat cable<br>1.27 mm [0.050“] pitch:<br>AWG 28/7 |
| Materials<br>Moulding | <br>Thermoplastic resin (PC)<br>UL 94-V0 |



* Others on request



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Number of contacts

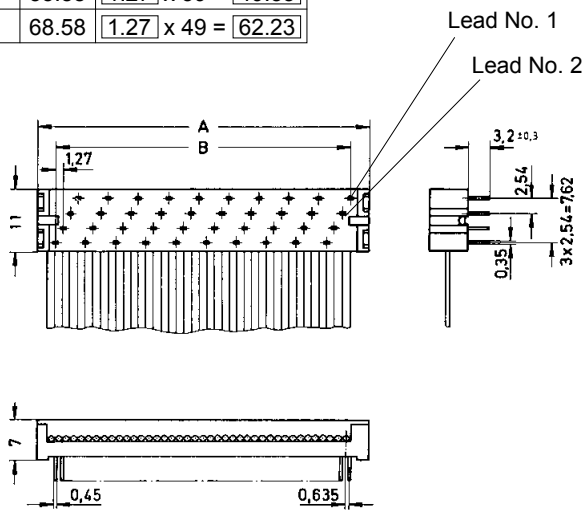
# 10–50

## Pcb transition connector, 4 rows

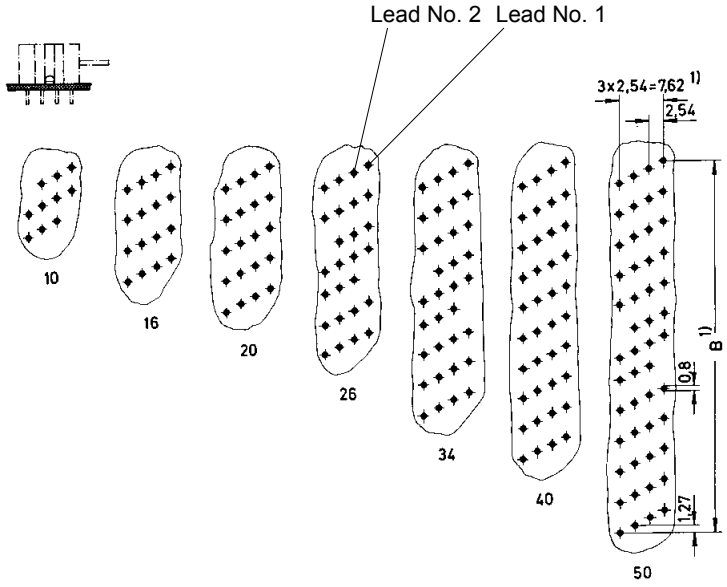
| Identification | No. of contacts | Part number |
|---|---|---|
| Pcb transition connector[2)] | | |
| 4 rows | 10 | 09 19 010 9643* |
| | 16 | 09 19 016 9643* |
| | 20 | 09 19 020 9643* |
| | 26 | 09 19 026 9643* |
| | 34 | 09 19 034 9643* |
| | 40 | 09 19 040 9643* |
| | 50 | 09 19 050 9643* |

Drawing — Dimensions in mm

| No. of contacts | A | B |
|---|---|---|
| 10 | 17.78 | 1.27 x 9 = 11.43 |
| 16 | 25.40 | 1.27 x 15 = 19.05 |
| 20 | 30.48 | 1.27 x 19 = 24.13 |
| 26 | 38.10 | 1.27 x 25 = 31.75 |
| 34 | 48.26 | 1.27 x 33 = 41.91 |
| 40 | 55.88 | 1.27 x 39 = 49.53 |
| 50 | 68.58 | 1.27 x 49 = 62.23 |




Board drillings




* Not normally kept in stock.
1) Pitch tolerance: ± 0.1
2) Not released for halogen free flat cables



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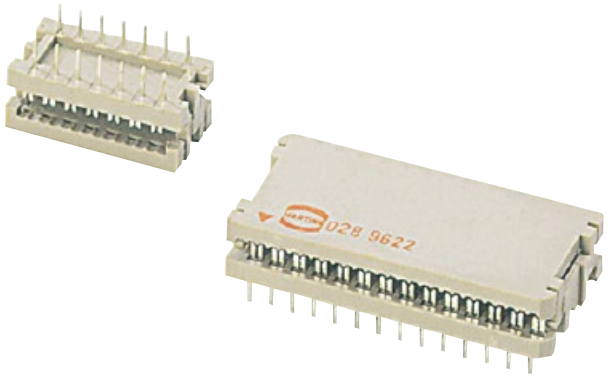
| | |
|---|---|
| Number of contacts* | 14, 16, 24, 28, 40 |
| Pitch | On pcb side: 2.54 mm [0.100“]<br>On cable side: 1.27 mm [0.050“] |
| Working current | 1 A |
| Test voltage $U_{r.m.s.}$ | 500 V |
| Contact resistance<br>Insulation resistance | ≤ 20 mΩ<br>≥ $10^{12}$ Ω |
| Temperature range | -40 °C … +125 °C<br>The maximum temperature includes heating of contacts and ambient temperature |
| Terminations | Solder pins<br>0.45 mm x 0.35 mm<br>for pcb hole Ø 0.8 mm<br>Diagonal: 0.58 mm<br>IDC flat cable<br>1.27 mm [0.050“] pitch:<br>AWG 28/7 |
| Materials<br>Moulding | <br>Thermoplastic resin (PC)<br>UL 94-V0 |



* Others on request



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Number of contacts

# 14–40

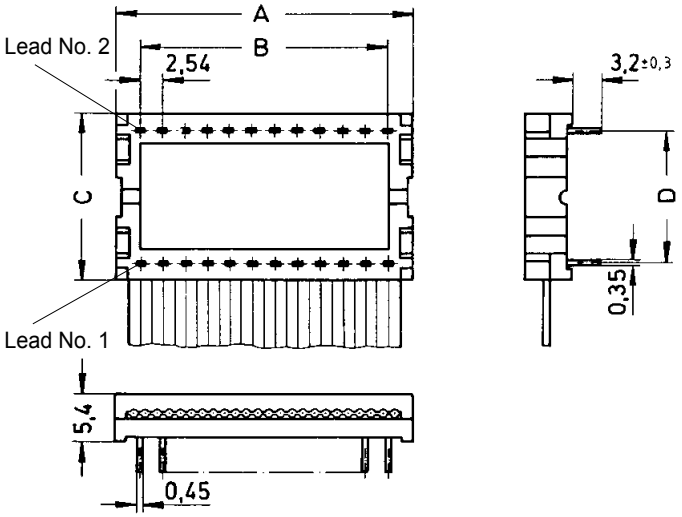
## DIP connector for IC base or for soldering into pcb

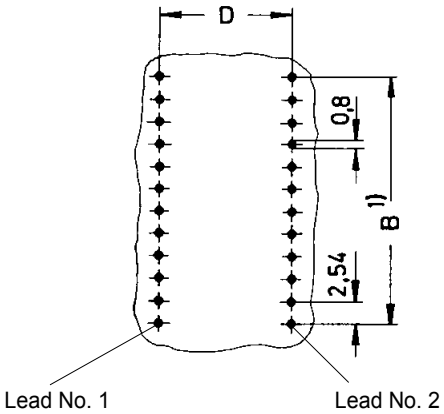
| Identification | No. of contacts | Part number |
|---|---|---|
| DIP connector[2] | 14 | 09 17 014 9622* |
| | 16 | 09 17 016 9622* |
| | 24 | 09 17 024 9622* |
| | 28 | 09 17 028 9622* |
| | 40 | 09 17 040 9622* |
| Board drillings | | |

Drawing

Dimensions in mm

| No. of contacts | A | B | C | D |
|---|---|---|---|---|
| 14 | 20.5 | 2.54 x 6 = 15.24 | 11 | 7.62 |
| 16 | 23.0 | 2.54 x 7 = 17.78 | 11 | 7.62 |
| 24 | 33.0 | 2.54 x 11 = 27.94 | 18.7 | 15.24 |
| 28 | 38.1 | 2.54 x 13 = 33.02 | 18.7 | 15.24 |
| 40 | 53.3 | 2.54 x 19 = 48.26 | 18.7 | 15.24 |






* Not normally kept in stock
1) Pitch tolerance: ± 0.1
2) Not released for halogen free flat cables



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| | |
|---|---|
| Number of contacts | 64 |
| Pitch | 2.54 mm [0.100“] |
| Working current | 1 A max. |
| Clearance<br>Creepage | ≥ 1.2 mm<br>≥ 1.2 mm |
| Working voltage<br>The working voltage also depends on the clearance and creepage dimensions of the pcb itself, and the associated wiring | according to the safety regulations of the equipment |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Contact resistance<br>Insulation resistance | ≤ 20 mΩ<br>≥ $10^{12}$ Ω |
| Temperature range | -55 °C … +125 °C<br>The maximum temperature includes heating of contacts and ambient temperature |
| Termination<br>Female connector | Insulation displacement: AWG 28/7 |
| Insertion and withdrawal force | ≤ 60 N |
| Materials<br>Moulding<br>Contacts<br>Contact surface<br>Contact zone | <br>Thermoplastic resin, glass-fibre filled, UL 94-V0<br>Copper alloy<br><br>selectively plated according to performance level |

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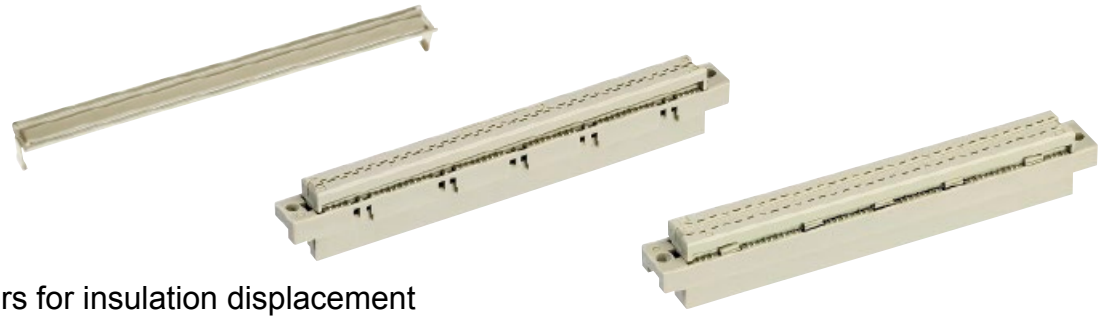
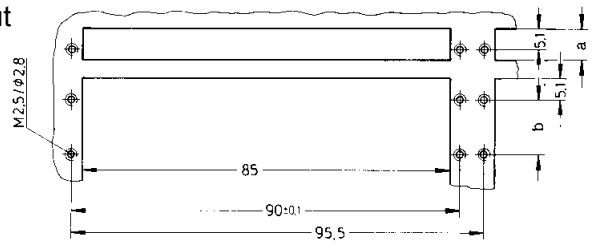
Number of contacts

# 64



## Female connectors for insulation displacement

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Female connector for insulation displacement** | | | | |
| | | performance level 2 | | |
| Type B | 64 | 09 02 264 6828 | | |
| | | performance level 3 | | |
| | | 09 02 264 7828 | | |
| | | | Lead number 1 of flat cable on contact 1 b | |
| | | | Contact arrangement View from termination side | |
| | | | | |
| | | performance level 2 | | |
| Type C | 64 | 09 03 264 6828<br>09 03 764 6828[c)] | | |
| | | performance level 3 | | |
| | | 09 03 264 7828 | | |
| | | | Lead number 1 of flat cable on contact 1 c | |
| | | | Contact arrangement View from termination side | |
| | | | | |
| | | | Mateable with 3-row male connector Type C.<br>No female contact in middle row. | |
| | | | Panel cut out | |
| **Strain relief**<br>for types B and C | | 09 03 000 9940 | | |



| | a | b |
|---|---|---|
| Type B | 8.3 | 10.16 |
| Type C | 10.8 | 12.7 |

Male connectors see DIN 41612 catalogue

c) Connectors with coding



Downloaded from Arrow.com.

| | |
|---|---|
| Number of contacts | 6, 10, 14, 16, 20, 26, 34, 40, 50, 60, 64 |
| Contact arrangement | straight |
| Contact length | 5.5 mm |
| Approvals | IEC 60603-13<br>DIN EN 60603-13<br>D 2632<br>BT 224<br>NFC 93-428 (HE 10)<br><br>UL recognized: E102079 |
| Pitch | 2.54 mm [0.100“] |
| Working current | 1 A |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Contact resistance | ≤ 20 mΩ |
| Insulation resistance | ≥ $10^9$ Ω |
| Temperature range | -55 °C … +105 °C<br>The maximum temperature includes heating of contacts and ambient temperature |
| **Press-in** | |
| Diameter of pcb plated through holes | Ø $1.0^{+0.09}_{-0.06}$ mm |
| Recommended pcb holes for press-in process | Hole: Ø 1.12 – 1.15 mm<br>Cu : 25 – 75 µm<br>Sn : 5 – 15 µm |
| Pcb thickness | 1.6 – 3.2 mm |
| **Materials** | |
| Moulding | Thermoplastic resin (PBT)<br>UL 94-V0 |
| **Contact surface** | |
| Contact zone | plated according to performance level[1)] |

## Insertion and withdrawal forces

| Number of contacts | Maximum force [N] | |
|---|---|---|
| | Performance level 1 and 2 | Performance level 3 |
| 6 | 12 | 18 |
| 10 | 20 | 30 |
| 14 | 28 | 42 |
| 16 | 32 | 48 |
| 20 | 40 | 60 |
| 26 | 52 | 78 |
| 34 | 68 | 102 |
| 40 | 80 | 120 |
| 50 | 100 | 150 |
| 60 | 120 | 180 |
| 64 | 128 | 192 |

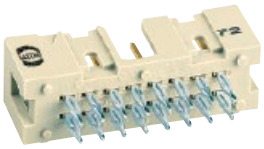
[1)] Performance level 3 as per IEC 60603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60603-13, ≥ 250 mating cycles, 4 days gas test
S4, plating = 0.76 µm (30 µinch) Au or PdNi eqivalent



Downloaded from Arrow.com.

Number of contacts

# 6–64



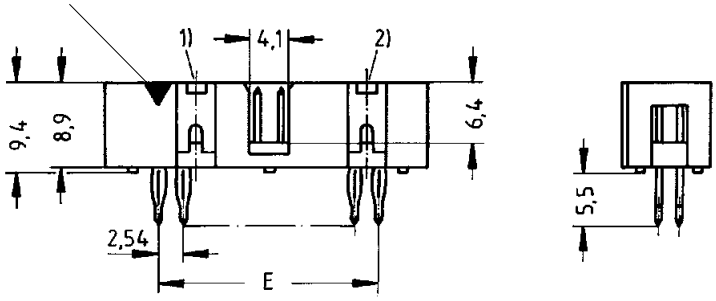
## Low-profile male header, straight press-in pins

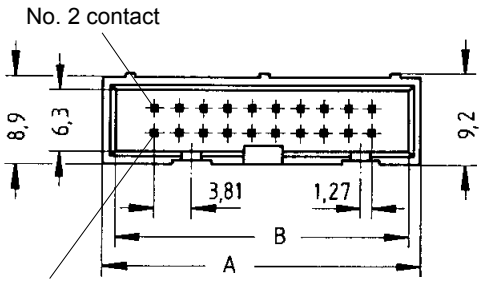
| Identification | No. of contacts | Part number |
|---|---|---|
| Low-profile male header with straight press-in terminations<br>Length: 5.5 mm | 6 | 09 18 506 ⌴ 329 |
| | 10 | 09 18 510 ⌴ 329 |
| | 14 | 09 18 514 ⌴ 329 |
| | 16 | 09 18 516 ⌴ 329 |
| | 20 | 09 18 520 ⌴ 329 |
| | 26 | 09 18 526 ⌴ 329 |
| | 34 | 09 18 534 ⌴ 329 |
| | 40 | 09 18 540 ⌴ 329 |
| | 50 | 09 18 550 ⌴ 329 |
| | 60 | 09 18 560 ⌴ 329 |
| | 64 | 09 18 564 ⌴ 329 |

Drawing — Dimensions in mm

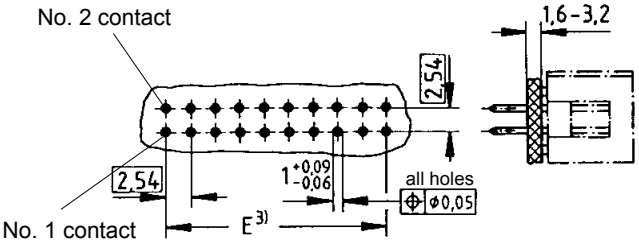
| No. of contacts | A | B | E |
|---|---|---|---|
| 6 | 15.2 | 12.78 | 2.54 x 2 = 5.08 |
| 10 | 20.3 | 17.86 | 2.54 x 4 = 10.16 |
| 14 | 25.4 | 22.94 | 2.54 x 6 = 15.24 |
| 16 | 27.9 | 25.48 | 2.54 x 7 = 17.78 |
| 20 | 33.0 | 30.56 | 2.54 x 9 = 22.86 |
| 26 | 40.6 | 38.18 | 2.54 x 12 = 30.48 |
| 34 | 50.8 | 48.34 | 2.54 x 16 = 40.64 |
| 40 | 58.4 | 55.96 | 2.54 x 19 = 48.26 |
| 50 | 71.3 | 68.66 | 2.54 x 24 = 60.96 |
| 60 | 84.0 | 81.36 | 2.54 x 29 = 73.66 |
| 64 | 89.1 | 86.44 | 2.54 x 31 = 78.74 |

Marking No. 1 contact




Board drillings




For Performance Level 3 please specify digit
For Performance Level 2 please specify digit
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent

7
6
5 Not normally kept in stock

1) No polarization slot for 6, 10 or 14 way
2) No polarization slot for 6 way
3) Pitch tolerance: ± 0.1



Downloaded from Arrow.com.

| | |
|---|---|
| Number of contacts | 6, 10, 14, 16, 20, 24, 26, 30, 34, 40, 50, 60, 64 |
| Contact arrangement | straight, angled |
| Contact length | 2.9 mm |
| Approvals | IEC 60603-13<br>DIN EN 60603-13<br>D 2632<br>BT 224<br>NFC 93-428 (HE 10) |
| Pitch | 2.54 mm [0.100"] |
| Working current | 1 A |
| Working voltage | 500 V<br>for pollution degree 1 |
| Test voltage $U_{r.m.s.}$ | 1 kV |
| Contact resistance<br>Insulation resistance | ≤ 20 mΩ<br>≥ $10^9$ Ω |
| Temperature range | -55 °C … +125 °C |
| during reflow soldering | max. + 240 °C for 60 s |
| The higher temperature limit includes the local ambient and heating effect of the contacts under load | |
| Terminations | For pcb hole Ø 1 ± 0.1 mm<br>DIN IEC 52141<br>Diagonal: 0.79 mm |
| Materials | |
| Moulding | Thermoplastic resin (PCT)<br>UL 94-V0 |
| Contact surface | |
| Contact zone | gold-plated according to performance level[1)] |
| Options on request | |
| Colour of connectors | black |
| For pick & place process | Tape & Reel packaging<br>with/without vacuum plate<br>Tube packaging<br>with/without vacuum plate |

New

## Insertion and withdrawal forces

| Number of contacts | Maximum force [N] | |
|---|---|---|
| | Performance level 1 and 2 | Performance level 3 |
| 6 | 12 | 18 |
| 10 | 20 | 30 |
| 14 | 28 | 42 |
| 16 | 32 | 48 |
| 20 | 40 | 60 |
| 24 | 48 | 72 |
| 26 | 52 | 78 |
| 30 | 60 | 90 |
| 34 | 68 | 102 |
| 40 | 80 | 120 |
| 50 | 100 | 150 |
| 60 | 120 | 180 |
| 64 | 128 | 192 |

[1)] Performance level 3 as per IEC 60603-13, ≥ 50 mating cycles, no gas test
Performance level 2 as per IEC 60603-13, ≥ 250 mating cycles, 4 days gas test
S4, plating = 0.76 µm (30 µinch) Au or PdNi eqivalent



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# Notes





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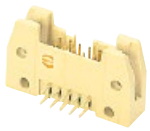
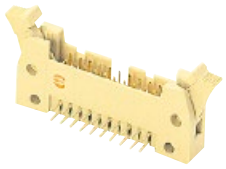
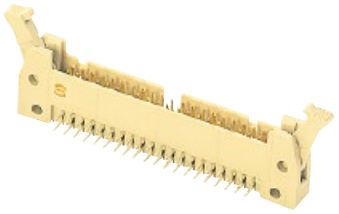
Number of contacts

# 6–64

## SMC male header with angled solder pins

| Identification | No. of contacts | Part number ← Without levers | With short levers | With long levers → |
|---|---|---|---|---|
| SMC male header with angled solder pins<br>Length: 2.9 mm | 6 | 09 19 506 ⌴ 923 | 09 19 506 ⌴ 913 | 09 19 506 ⌴ 903 |
| | 10 | 09 19 510 ⌴ 923 | 09 19 510 ⌴ 913 | 09 19 510 ⌴ 903 |
| | 14 | 09 19 514 ⌴ 923 | 09 19 514 ⌴ 913 | 09 19 514 ⌴ 903 |
| | 16 | 09 19 516 ⌴ 923 | 09 19 516 ⌴ 913 | 09 19 516 ⌴ 903 |
| | 20 | 09 19 520 ⌴ 923 | 09 19 520 ⌴ 913 | 09 19 520 ⌴ 903 |
| | 24 | 09 19 524 ⌴ 923 | 09 19 524 ⌴ 913 | 09 19 524 ⌴ 903 |
| | 26 | 09 19 526 ⌴ 923 | 09 19 526 ⌴ 913 | 09 19 526 ⌴ 903 |
| | 30 | 09 19 530 ⌴ 923 | 09 19 530 ⌴ 913 | 09 19 530 ⌴ 903 |
| | 34 | 09 19 534 ⌴ 923 | 09 19 534 ⌴ 913 | 09 19 534 ⌴ 903 |
| | 40 | 09 19 540 ⌴ 923 | 09 19 540 ⌴ 913 | 09 19 540 ⌴ 903 |
| | 50 | 09 19 550 ⌴ 923 | 09 19 550 ⌴ 913 | 09 19 550 ⌴ 903 |
| | 60 | 09 19 560 ⌴ 923 | 09 19 560 ⌴ 913 | 09 19 560 ⌴ 903 |
| | 64 | 09 19 564 ⌴ 923 | 09 19 564 ⌴ 913 | 09 19 564 ⌴ 903 |

Kinked version on request

* Not normally kept in stock
For accessories see page 08.48
For dimensions see page 08.39

For performance level 3 please specify digit 7 *
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5 *

7 6 5 *

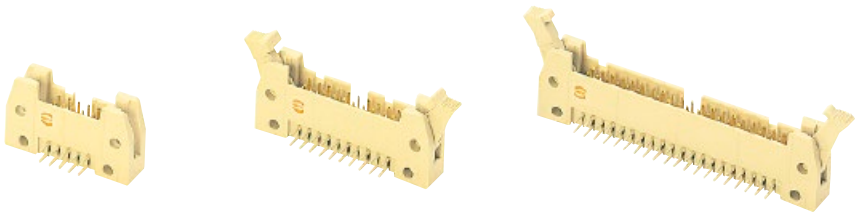
7 6 5 *



Downloaded from Arrow.com.

Number of contacts

# 6–64

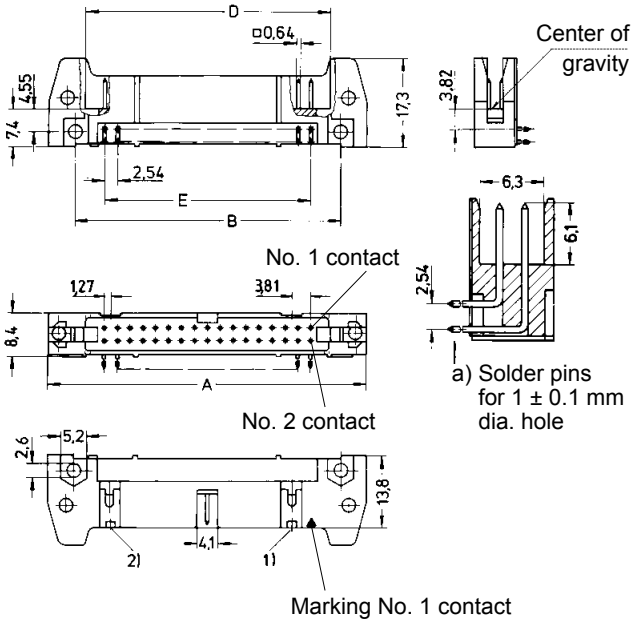


## SMC male header with angled solder pins

| Identification | Drawing | Dimensions in mm |
|---|---|---|

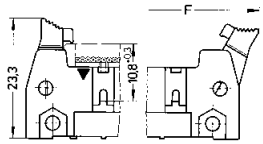
SMC male header

| No. of contacts | A | B | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 | 26.9 | 16.76 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 21.84 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 26.92 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 29.46 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 34.54 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 39.62 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 42.16 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 47.24 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 52.32 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 59.94 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 72.64 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 85.34 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 90.42 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |



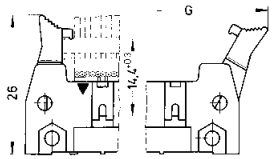

Short levers

for use with female connector without strain relief clamp

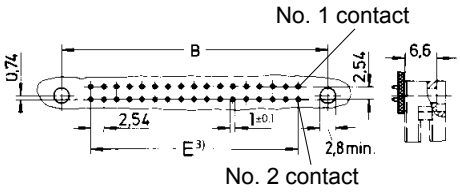



Long levers

for use with female connector with strain relief clamp




Board drillings




1) No polarization slot for 6, 10 or 14 way male header

2) No polarization slot for 6 way male header

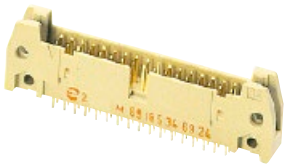
3) Pitch tolerance: ± 0.1



Downloaded from Arrow.com.

Number of contacts

# 6–64



## SMC male header with straight solder pins

| Identification | No. of contacts | Part number: Without levers | Part number: With short levers | Part number: With long levers |
|---|---|---|---|---|
| SMC male header with straight solder pins<br>Length: 2.9 mm | 6 | 09 19 506 ⌴ 924 | 09 19 506 ⌴ 914 | 09 19 506 ⌴ 904 |
| | 10 | 09 19 510 ⌴ 924 | 09 19 510 ⌴ 914 | 09 19 510 ⌴ 904 |
| | 14 | 09 19 514 ⌴ 924 | 09 19 514 ⌴ 914 | 09 19 514 ⌴ 904 |
| | 16 | 09 19 516 ⌴ 924 | 09 19 516 ⌴ 914 | 09 19 516 ⌴ 904 |
| | 20 | 09 19 520 ⌴ 924 | 09 19 520 ⌴ 914 | 09 19 520 ⌴ 904 |
| | 24 | 09 19 524 ⌴ 924 | 09 19 524 ⌴ 914 | 09 19 524 ⌴ 904 |
| | 26 | 09 19 526 ⌴ 924 | 09 19 526 ⌴ 914 | 09 19 526 ⌴ 904 |
| | 30 | 09 19 530 ⌴ 924 | 09 19 530 ⌴ 914 | 09 19 530 ⌴ 904 |
| | 34 | 09 19 534 ⌴ 924 | 09 19 534 ⌴ 914 | 09 19 534 ⌴ 904 |
| | 40 | 09 19 540 ⌴ 924 | 09 19 540 ⌴ 914 | 09 19 540 ⌴ 904 |
| | 50 | 09 19 550 ⌴ 924 | 09 19 550 ⌴ 914 | 09 19 550 ⌴ 904 |
| | 60 | 09 19 560 ⌴ 924 | 09 19 560 ⌴ 914 | 09 19 560 ⌴ 904 |
| | 64 | 09 19 564 ⌴ 924 | 09 19 564 ⌴ 914 | 09 19 564 ⌴ 904 |

* Not normally kept in stock
For accessories see page 08.48
For dimensions see page 08.41

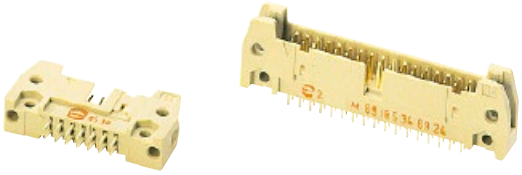
For performance level 3 please specify digit 7 *
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5 *



Downloaded from Arrow.com.

Number of contacts

# 6–64

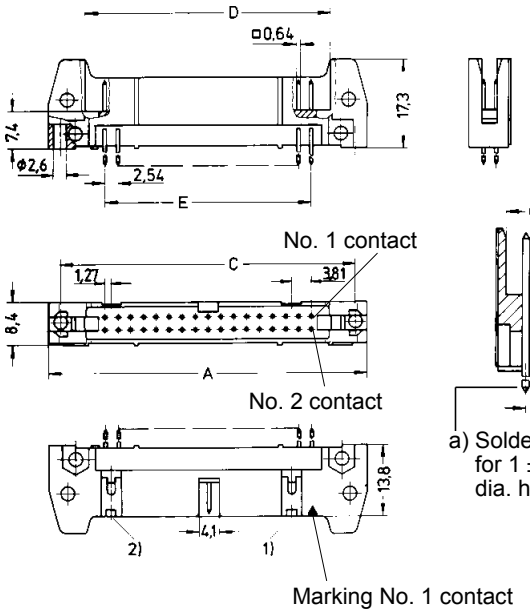


## SMC male header with straight solder pins

| Identification | Drawing | Dimensions in mm |
|---|---|---|

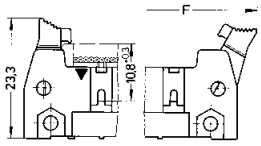
SMC male header

| No. of contacts | A | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 | 26.9 | 22.86 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 27.94 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 33.02 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 35.56 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 40.64 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 45.72 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 48.26 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 53.34 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 58.42 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 66.04 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 78.74 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 91.44 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 96.52 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |



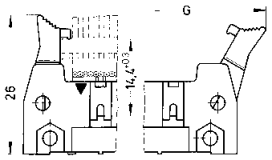

### Short levers

for use with female connector without strain relief clamp

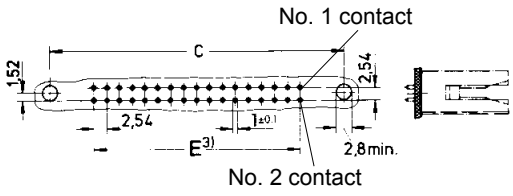



### Long levers

for use with female connector with strain relief clamp




Board drillings




1) No polarization slot for 6, 10 or 14 way male header

2) No polarization slot for 6 way male header

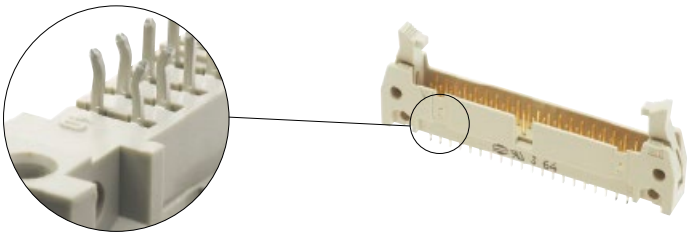
3) Pitch tolerance: ± 0.1



Downloaded from Arrow.com.

Number of contacts

# 6–64



## SMC male header with straight solder pins, kinked

| Identification | No. of contacts | Part number Without levers | With short levers | With long levers |
|---|---|---|---|---|
| SMC male header with straight solder pins, kinked<br>Length: 2.9 mm | 6 | 09 19 506 ⌴ 024 | 09 19 506 ⌴ 014 | 09 19 506 ⌴ 004 |
| | 10 | 09 19 510 ⌴ 024 | 09 19 510 ⌴ 014 | 09 19 510 ⌴ 004 |
| | 14 | 09 19 514 ⌴ 024 | 09 19 514 ⌴ 014 | 09 19 514 ⌴ 004 |
| | 16 | 09 19 516 ⌴ 024 | 09 19 516 ⌴ 014 | 09 19 516 ⌴ 004 |
| | 20 | 09 19 520 ⌴ 024 | 09 19 520 ⌴ 014 | 09 19 520 ⌴ 004 |
| | 24 | 09 19 524 ⌴ 024 | 09 19 524 ⌴ 014 | 09 19 524 ⌴ 004 |
| | 26 | 09 19 526 ⌴ 024 | 09 19 526 ⌴ 014 | 09 19 526 ⌴ 004 |
| | 30 | 09 19 530 ⌴ 024 | 09 19 530 ⌴ 014 | 09 19 530 ⌴ 004 |
| | 34 | 09 19 534 ⌴ 024 | 09 19 534 ⌴ 014 | 09 19 534 ⌴ 004 |
| | 40 | 09 19 540 ⌴ 024 | 09 19 540 ⌴ 014 | 09 19 540 ⌴ 004 |
| | 50 | 09 19 550 ⌴ 024 | 09 19 550 ⌴ 014 | 09 19 550 ⌴ 004 |
| | 60 | 09 19 560 ⌴ 024 | 09 19 560 ⌴ 014 | 09 19 560 ⌴ 004 |
| | 64 | 09 19 564 ⌴ 024 | 09 19 564 ⌴ 014 | 09 19 564 ⌴ 004 |

* Not normally kept in stock
For accessories see page 08.48
For dimensions see page 08.43

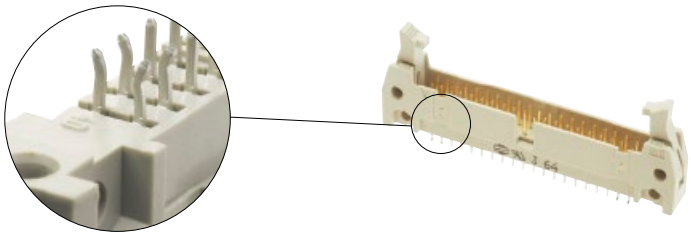
For performance level 3 please specify digit 7 6 5 *
For performance level 2 please specify digit 7 6 5 *
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 7 6 5 *



Downloaded from Arrow.com.

Number of contacts

# 6–64



## SMC male header with straight solder pins, kinked

Identification

SMC male header

Board drillings

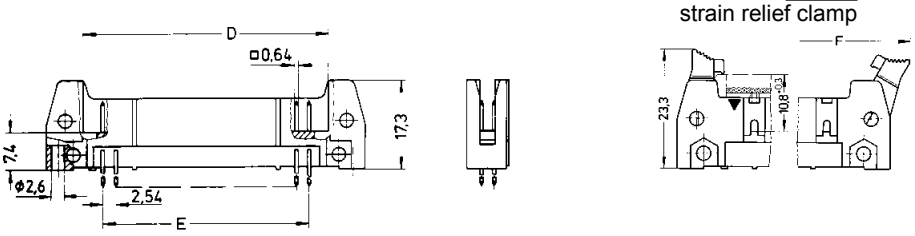
Drawing

Dimensions in mm

| No. of contacts | A | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 | 26.9 | 22.86 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 27.94 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 33.02 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 35.56 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 40.64 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 45.72 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 48.26 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 53.34 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 58.42 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 66.04 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 78.74 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 91.44 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 96.52 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |

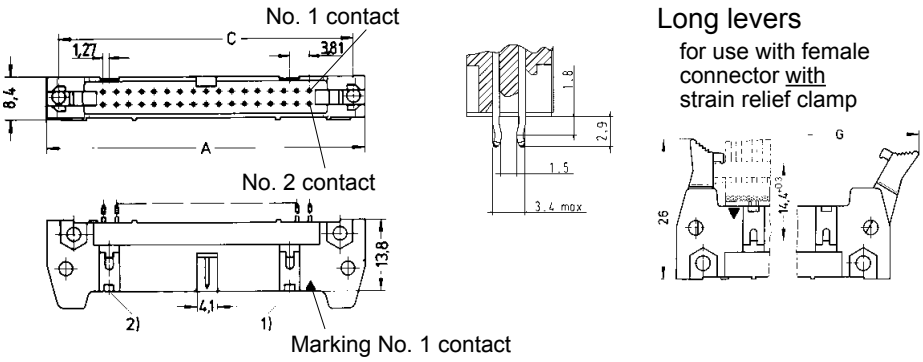
### Short levers

for use with female connector without strain relief clamp




### Long levers

for use with female connector with strain relief clamp




● Kinked contact: pcb thickness from 1.50 to 1.94 mm after Cu + Sn plating with non-remelted through holes ø 0.80 to ø 0.95 mm. Max. insertion force = 125 N. Min. retention force = 6 N.

○ Non-kinked contact: Solder pins for pcb connections ø 1 ± 0.1 mm as per IEC 60603-13.

1) No polarization slot for 6, 10 or 14 way male header

2) No polarization slot for 6 way male header

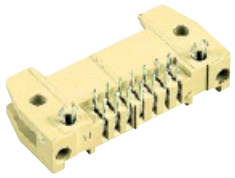
3) Pitch tolerance: ± 0.1



Downloaded from Arrow.com.

Number of contacts

# 6–64



## SMC male header with angled solder pins and board lock

| Identification | No. of contacts | Part number Without levers | With short levers | With long levers |
|---|---|---|---|---|
| SMC male header with angled solder pins and pcb board lock<br>Length: 2.9 mm<br>for 1.6 mm pcb thickness | 6 | 09 19 506 ⌴ 973* | 09 19 506 ⌴ 963* | 09 19 506 ⌴ 953* |
| | 10 | 09 19 510 ⌴ 973* | 09 19 510 ⌴ 963* | 09 19 510 ⌴ 953* |
| | 14 | 09 19 514 ⌴ 973* | 09 19 514 ⌴ 963* | 09 19 514 ⌴ 953* |
| | 16 | 09 19 516 ⌴ 973* | 09 19 516 ⌴ 963* | 09 19 516 ⌴ 953* |
| | 20 | 09 19 520 ⌴ 973* | 09 19 520 ⌴ 963* | 09 19 520 ⌴ 953* |
| To hold the connector on the pcb before the soldering process, two board locks have been added on the male header with angled solder pins. | 24 | 09 19 524 ⌴ 973* | 09 19 524 ⌴ 963* | 09 19 524 ⌴ 953* |
| | 26 | 09 19 526 ⌴ 973* | 09 19 526 ⌴ 963* | 09 19 526 ⌴ 953* |
| | 30 | 09 19 530 ⌴ 973* | 09 19 530 ⌴ 963* | 09 19 530 ⌴ 953* |
| | 34 | 09 19 534 ⌴ 973* | 09 19 534 ⌴ 963* | 09 19 534 ⌴ 953* |
| | 40 | 09 19 540 ⌴ 973* | 09 19 540 ⌴ 963* | 09 19 540 ⌴ 953* |
| | 50 | 09 19 550 ⌴ 973* | 09 19 550 ⌴ 963* | 09 19 550 ⌴ 953* |
| | 60 | 09 19 560 ⌴ 973* | 09 19 560 ⌴ 963* | 09 19 560 ⌴ 953* |
| | 64 | 09 19 564 ⌴ 973* | 09 19 564 ⌴ 963* | 09 19 564 ⌴ 953* |

* Not normally kept in stock

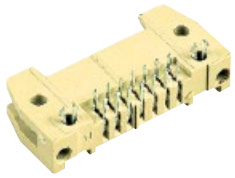
For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5



Downloaded from Arrow.com.

Number of contacts

# 6–64

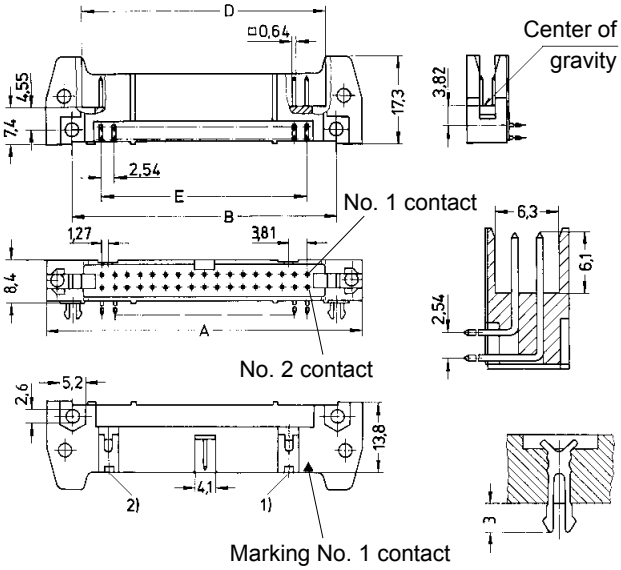


## SMC male header with angled solder pins and board lock

| Identification | Drawing | Dimensions in mm |
|---|---|---|

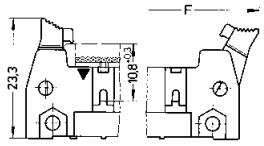
SMC male header

| No. of contacts | A | B | D | E | F | G |
|---|---|---|---|---|---|---|
| 6 | 26.9 | 16.76 | 12.45 | 2.54 x 2 = 5.08 | 36.9 | 40.3 |
| 10 | 32.0 | 21.84 | 17.53 | 2.54 x 4 = 10.16 | 42.0 | 45.4 |
| 14 | 37.1 | 26.92 | 22.61 | 2.54 x 6 = 15.24 | 47.1 | 50.4 |
| 16 | 39.6 | 29.46 | 25.15 | 2.54 x 7 = 17.78 | 49.6 | 53.0 |
| 20 | 44.7 | 34.54 | 30.23 | 2.54 x 9 = 22.86 | 54.7 | 58.1 |
| 24 | 49.8 | 39.62 | 35.91 | 2.54 x 11 = 27.94 | 59.8 | 63.2 |
| 26 | 52.3 | 42.16 | 37.85 | 2.54 x 12 = 30.48 | 62.3 | 65.7 |
| 30 | 57.7 | 47.24 | 43.83 | 2.54 x 14 = 35.56 | 68.2 | 68.6 |
| 34 | 62.5 | 52.32 | 48.01 | 2.54 x 16 = 40.64 | 72.5 | 75.8 |
| 40 | 70.1 | 59.94 | 55.63 | 2.54 x 19 = 48.26 | 80.1 | 83.5 |
| 50 | 82.8 | 72.64 | 68.33 | 2.54 x 24 = 60.96 | 92.8 | 96.2 |
| 60 | 95.5 | 85.34 | 81.03 | 2.54 x 29 = 73.66 | 105.5 | 108.9 |
| 64 | 100.6 | 90.42 | 86.11 | 2.54 x 31 = 78.74 | 110.6 | 113.9 |



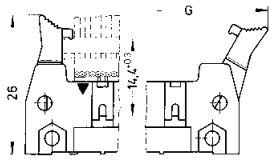

Short levers

for use with female connector without strain relief clamp

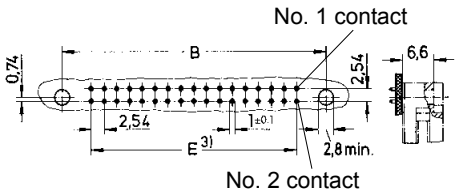



Long levers

for use with female connector with strain relief clamp




Board drillings




SEK



For accessories see page 08.48

1) No polarization slot for 6, 10 or 14 way male header

2) No polarization slot for 6 way male header

3) Pitch tolerance: ± 0.1

Downloaded from Arrow.com.

Number of contacts

# 6–64

Tape & Reel packaging

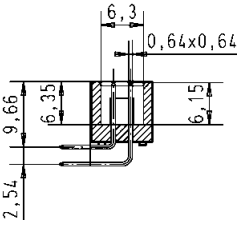
## SMC low-profile male header, angled solder pins

| Identification | No. of contacts | Part number |
|---|---|---|
| **SMC male header with angled solder pins** | | |
| Length: 2.9 mm<br>Colour: Beige<br>Packaging: Carton | 6 | 09 19 506 ⌴ 323 |
| | 10 | 09 19 510 ⌴ 323 |
| | 14 | 09 19 514 ⌴ 323 |
| | 16 | 09 19 516 ⌴ 323 |
| | 20 | 09 19 520 ⌴ 323 |
| | 26 | 09 19 526 ⌴ 323 |
| | 30 | 09 19 530 ⌴ 323 |
| | 34 | 09 19 534 ⌴ 323 |
| | 40 | 09 19 540 ⌴ 323 |
| | 50 | 09 19 550 ⌴ 323 |
| | 60 | 09 19 560 ⌴ 323 |
| | 64 | 09 19 564 ⌴ 323 |
| Colour: Beige<br>Packaging: Tape & Reel<br>Vacuum plate for pick & place process | 6 | 09 19 506 ⌴ 323 740 |
| | 10 | 09 19 510 ⌴ 323 740 |
| | 14 | 09 19 514 ⌴ 323 740 |
| | 16 | 09 19 516 ⌴ 323 740 |
| | 20 | 09 19 520 ⌴ 323 740 |
| | 26 | 09 19 526 ⌴ 323 740 |
| | 30 | 09 19 530 ⌴ 323 740 |
| | 34 | 09 19 534 ⌴ 323 740 |
| | 40 | 09 19 540 ⌴ 323 740 |
| Colour: Black<br>Packaging: Tape & Reel<br>Vacuum plate for pick & place process | 6 | 09 19 506 ⌴ 323 741 |
| | 10 | 09 19 510 ⌴ 323 741 |
| | 14 | 09 19 514 ⌴ 323 741 |
| | 16 | 09 19 516 ⌴ 323 741 |
| | 20 | 09 19 520 ⌴ 323 741 |
| | 26 | 09 19 526 ⌴ 323 741 |
| | 30 | 09 19 530 ⌴ 323 741 |
| | 34 | 09 19 534 ⌴ 323 741 |
| | 40 | 09 19 540 ⌴ 323 741 |

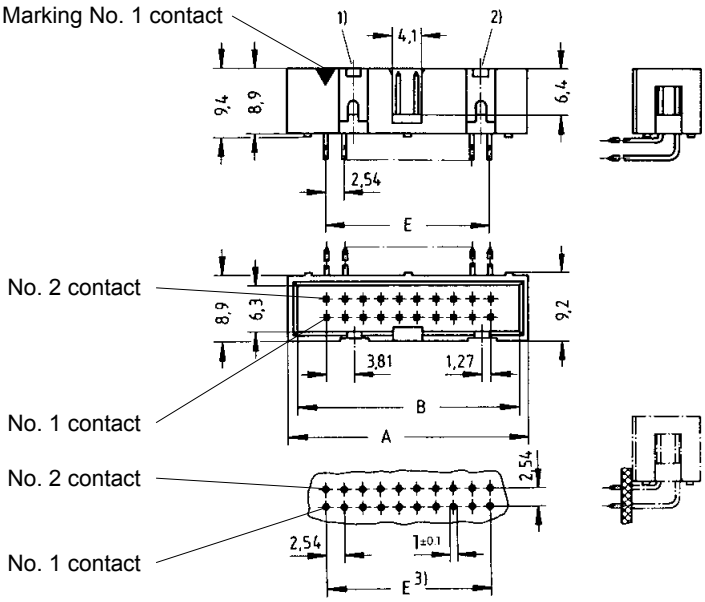
For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5 *

Drawing

| No. of contacts | A | B | E |
|---|---|---|---|
| 6 | 15.2 | 12.78 | 2.54 x 2 = 5.08 |
| 10 | 20.3 | 17.86 | 2.54 x 4 = 10.16 |
| 14 | 25.4 | 22.94 | 2.54 x 6 = 15.24 |
| 16 | 27.9 | 25.48 | 2.54 x 7 = 17.78 |
| 20 | 33.0 | 30.56 | 2.54 x 9 = 22.86 |
| 26 | 40.6 | 38.18 | 2.54 x 12 = 30.48 |
| 30 | 45.72 | 43.26 | 2.54 x 14 = 35.56 |
| 34 | 50.8 | 48.34 | 2.54 x 16 = 40.64 |
| 40 | 58.4 | 55.96 | 2.54 x 19 = 48.26 |
| 50 | 71.3 | 68.66 | 2.54 x 24 = 60.96 |
| 60 | 84.0 | 81.36 | 2.54 x 29 = 73.66 |
| 64 | 89.1 | 86.44 | 2.54 x 31 = 78.74 |

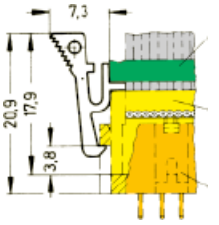



Solder pins for 1 ± 0.1 mm dia. hole




| Identification | Part number |
|---|---|
| **Locking lever for female connector with strain relief**<br>in conjunction with low-profile male header | 09 18 000 9905 4) |

Drawing




Strain relief clamp

Female connector

Low-profile male header

When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector.

* Not normally kept in stock

1) No polarization slot for 6, 10 or 14 way male header
2) No polarization slot for 6 way male header
3) Pitch tolerance: ± 0.1
4) Order 2 per female connector



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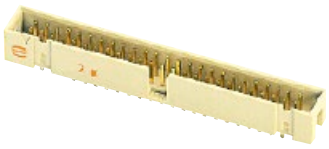
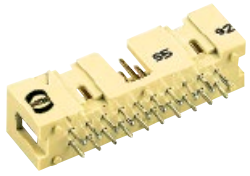
Number of contacts

# 6–64

Tape & Reel packaging





## SMC low-profile male header, straight solder pins

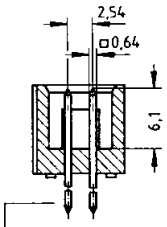
| Identification | No. of contacts | Part number |
|---|---|---|
| **SMC male header with straight solder pins**<br>Length: 2.9 mm<br>Colour: Beige<br>Packaging: Carton | 6 | 09 19 506 ⌴ 324 |
| | 10 | 09 19 510 ⌴ 324 |
| | 14 | 09 19 514 ⌴ 324 |
| | 16 | 09 19 516 ⌴ 324 |
| | 20 | 09 19 520 ⌴ 324 |
| | 26 | 09 19 526 ⌴ 324 |
| | 30 | 09 19 530 ⌴ 324 |
| | 34 | 09 19 534 ⌴ 324 |
| | 40 | 09 19 540 ⌴ 324 |
| | 50 | 09 19 550 ⌴ 324 |
| | 60 | 09 19 560 ⌴ 324 |
| | 64 | 09 19 564 ⌴ 324 |
| Colour: Beige<br>Packaging: Tape & Reel<br>Vacuum plate for pick & place process | 6 | 09 19 506 ⌴ 324 740 |
| | 10 | 09 19 510 ⌴ 324 740 |
| | 14 | 09 19 514 ⌴ 324 740 |
| | 16 | 09 19 516 ⌴ 324 740 |
| | 20 | 09 19 520 ⌴ 324 740 |
| | 26 | 09 19 526 ⌴ 324 740 |
| | 30 | 09 19 530 ⌴ 324 740 |
| | 34 | 09 19 534 ⌴ 324 740 |
| | 40 | 09 19 540 ⌴ 324 740 |
| Colour: Black<br>Packaging: Tape & Reel<br>Vacuum plate for pick & place process | 6 | 09 19 506 ⌴ 324 741 |
| | 10 | 09 19 510 ⌴ 324 741 |
| | 14 | 09 19 514 ⌴ 324 741 |
| | 16 | 09 19 516 ⌴ 324 741 |
| | 20 | 09 19 520 ⌴ 324 741 |
| | 26 | 09 19 526 ⌴ 324 741 |
| | 30 | 09 19 530 ⌴ 324 741 |
| | 34 | 09 19 534 ⌴ 324 741 |
| | 40 | 09 19 540 ⌴ 324 741 |

For performance level 3 please specify digit 7
For performance level 2 please specify digit 6
S4 = 0.76 µm (30 µinch) Au or PdNi eqivalent 5 *

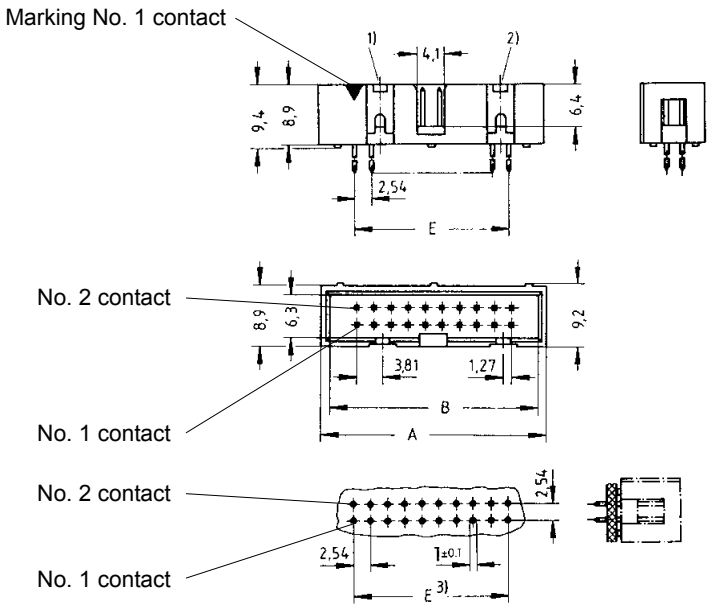
Drawing

| No. of contacts | A | B | E |
|---|---|---|---|
| 6 | 15.2 | 12.78 | 2.54 x 2 = 5.08 |
| 10 | 20.3 | 17.86 | 2.54 x 4 = 10.16 |
| 14 | 25.4 | 22.94 | 2.54 x 6 = 15.24 |
| 16 | 27.9 | 25.48 | 2.54 x 7 = 17.78 |
| 20 | 33.0 | 30.56 | 2.54 x 9 = 22.86 |
| 26 | 40.6 | 38.18 | 2.54 x 12 = 30.48 |
| 30 | 45.72 | 43.26 | 2.54 x 14 = 35.56 |
| 34 | 50.8 | 48.34 | 2.54 x 16 = 40.64 |
| 40 | 58.4 | 55.96 | 2.54 x 19 = 48.26 |
| 50 | 71.3 | 68.66 | 2.54 x 24 = 60.96 |
| 60 | 84.0 | 81.36 | 2.54 x 29 = 73.66 |
| 64 | 89.1 | 86.44 | 2.54 x 31 = 78.74 |

Dimensions in mm

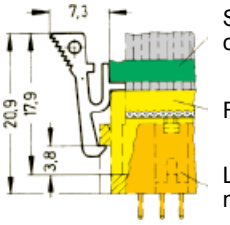



Solder pins for 1 ± 0.1 mm dia. hole




| Identification | Part number |
|---|---|
| **Locking lever for female connector with strain relief**<br>in conjunction with low-profile male header | 09 18 000 9905 4) |

Drawing




When the security of latching is required and space is a premium, these locking levers can be fitted onto the strain relief of the HARTING female connector.

Dimensions in mm

* Not normally kept in stock

1) No polarization slot for 6, 10 or 14 way male header
2) No polarization slot for 6 way male header
3) Pitch tolerance: ± 0.1
4) Order 2 per female connector



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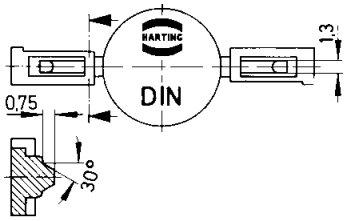
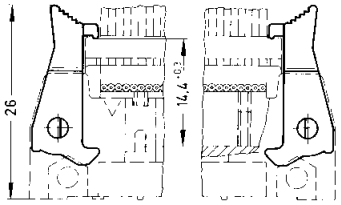
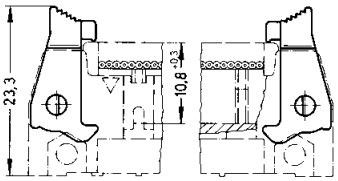
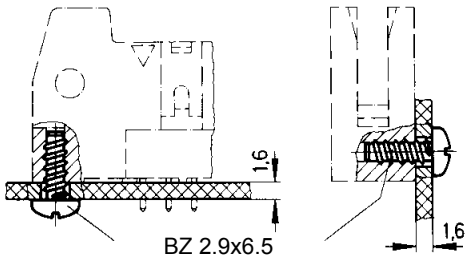
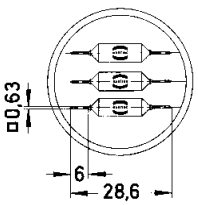
## Accessories

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Polarization key**<br><br>1) Part number comprises 2 keys | 09 18 500 9902[1] |  | |
| **Locking lever**<br>(snaps into place, can be fitted whenever required)<br><br>2) Order 2 per male header | Long:<br>09 19 000 9903[2]<br><br>Short:<br>09 19 000 9904[2] | Long<br>  <br>For use with female connector with strain relief clamp<br><br>Short<br>  <br>For use with female connector without strain relief clamp | |
| **Fixing screws**<br>for 1.6 mm P.C. board<br><br>3) Part number comprises 50 pieces | 09 18 000 9906[3] |  <br>BZ 2.9x6.5<br>(DIN 7981 or DIN 7049) | For connectors with part numbers<br>09 18 5xx x9xx: screwing torque 0.2 Nm<br>09 19 5xx x9xx: screwing torque 0.4 – 0.5 Nm<br><br>Screw material: Steel (Inox A2)<br><br>Plating: Nickel |
| **Coding system with loss of contact**<br><br>4) Part number comprises 6 code pins | Code pin<br>09 18 000 9901[4]<br><br>Removal tool for male contacts<br>09 99 000 0133 | To avoid cross-plugging adjacent connectors a coding system is required.<br>A code pin is inserted into the appropriate cavity in the female connector.<br>The corresponding male contact is removed by a special removal tool.<br><br>  <br> | |



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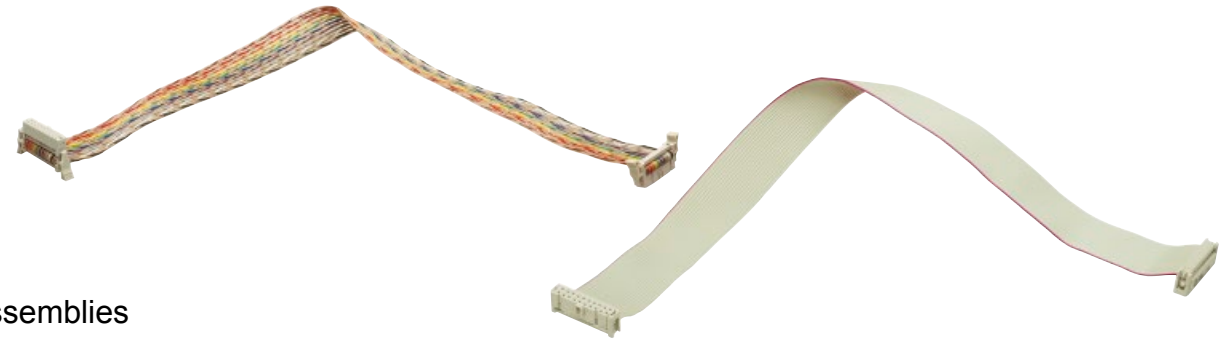
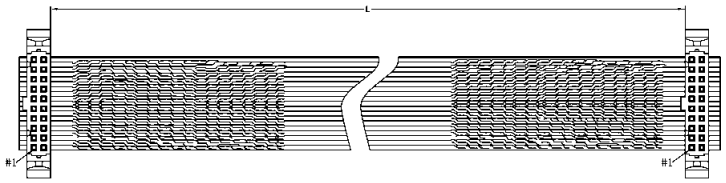
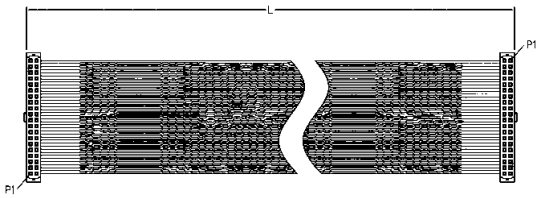
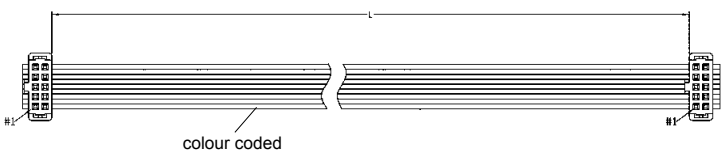


## Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly SEK 20-pole**<br>Cable: Flat cable, 10 twisted pairs, AWG 28/7, 1.27 mm pitch<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m | 33 18 243 0500 060 | | |
| L = 1.0 m | 33 18 243 1000 062 | | |
| L = 1.5 m | 33 18 243 1500 068 | | |
| **Cable assembly SEK 40-pole**<br>Cable: Flat cable, 20 twisted pairs, AWG 28/7, 1.27 mm pitch<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m | 33 18 243 0500 055 | | |
| L = 1.0 m | 33 18 243 1000 057 | | |
| L = 1.5 m | 33 18 243 1500 069 | | |
| **Cable assembly SEK 10-pole**<br>Cable: Flat cable, grey, 10 wires, AWG 28/7, 1.27 mm pitch<br>Wiring: 1:1 | |  | |
| Length: L = 0.1 m | 33 18 243 0100 063 | | |
| L = 0.2 m | 33 18 243 0200 064 | | |
| L = 0.5 m | 33 18 243 0500 065 | | |
| L = 0.8 m | 33 18 243 0800 066 | | |
| L = 1.0 m | 33 18 243 1000 067 | | |



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## Cables for insulation displacement termination

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|

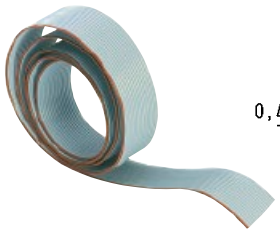
### Flat cable

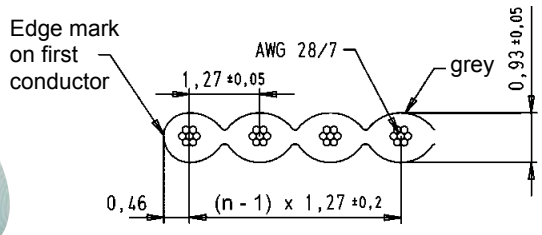
grey
UL AWM-style 2651
CSA

| No. of contacts | Part number |
|---|---|
| 6 | 09 18 006 700 ⌴ |
| 9 | 09 18 009 700 ⌴ |
| 10 | 09 18 010 700 ⌴ |
| 14 | 09 18 014 700 ⌴ |
| 15 | 09 18 015 700 ⌴ |
| 16 | 09 18 016 700 ⌴ |
| 18 | 09 18 018 700 ⌴ |
| 20 | 09 18 020 700 ⌴ |
| 24 | 09 18 024 700 ⌴ |
| 25 | 09 18 025 700 ⌴ |
| 26 | 09 18 026 700 ⌴ |
| 28 | 09 18 028 700 ⌴ |
| 30 | 09 18 030 700 ⌴ |
| 34 | 09 18 034 700 ⌴ |
| 37 | 09 18 037 700 ⌴ |
| 40 | 09 18 040 700 ⌴ |
| 50 | 09 18 050 700 ⌴ |
| 60 | 09 18 060 700 ⌴ |
| 64 | 09 18 064 700 ⌴ |

Length per reel

| | |
|---|---|
| 30.48 m (100 feet) | 1 |
| 100 m (328 feet) | 4 |






| | |
|---|---|
| Conductor material | Copper tinned |
| Gauge | AWG 28/7 0.089 mm² |
| Voltage rating | 300 $V_{r.m.s.}$ |
| Current rating at 25 °C | 2.1 A max. |
| Capacity unbalanced | 45.9 pF/m |
| Impedance unbalanced | 105 Ω |
| Propagation delay | 4.9 ns/m nominal |
| Insulation material | PVC |
| Temperature rating (operating) | -20 °C … +105 °C |
| Temperature rating (static) | -30 °C … +105 °C |
| Flammability rating | UL: VW-1 |
| Insulation resistance | > 100 MΩ/km |

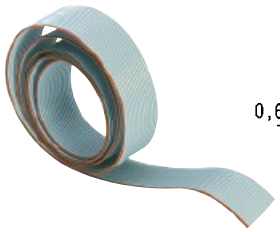
### Flat cable

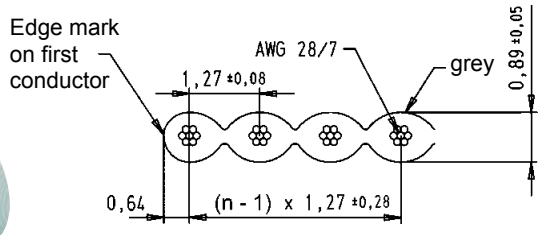
grey
non-halogenated
UL style 21447
for VW-1

| No. of contacts | Part number |
|---|---|
| 6 | 09 18 006 700 ⌴900 |
| 9 | 09 18 009 700 ⌴900 |
| 10 | 09 18 010 700 ⌴900 |
| 14 | 09 18 014 700 ⌴900 |
| 15 | 09 18 015 700 ⌴900 |
| 16 | 09 18 016 700 ⌴900 |
| 18 | 09 18 018 700 ⌴900 |
| 20 | 09 18 020 700 ⌴900 |
| 24 | 09 18 024 700 ⌴900 |
| 25 | 09 18 025 700 ⌴900 |
| 26 | 09 18 026 700 ⌴900 |
| 28 | 09 18 028 700 ⌴900 |
| 34 | 09 18 034 700 ⌴900 |
| 37 | 09 18 037 700 ⌴900 |
| 40 | 09 18 040 700 ⌴900 |
| 50 | 09 18 050 700 ⌴900 |
| 60 | 09 18 060 700 ⌴900 |
| 64 | 09 18 064 700 ⌴900 |

Length per reel

| | |
|---|---|
| 30.48 m (100 feet) | 1 |






| | |
|---|---|
| Conductor material | Copper tinned |
| Gauge | AWG 28/7 0.089 mm² |
| Voltage rating | 300 $V_{r.m.s.}$ |
| Current rating | 1.3 A |
| Capacity unbalanced | 42.6 pF/m at 1 MHz |
| Impedance unbalanced | 100 Ω |
| Inductance | 0.56 µH/m |
| Propagation delay | 4.8 ns/m |
| Insulation material | Non-halogenated flame retardent Polyolefin |
| Temperature rating | -40 °C … +80 °C |
| Insulation resistance | 10000 MΩ/km |

Important: always store reel vertically



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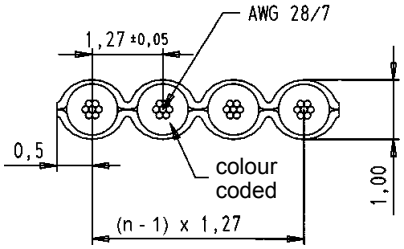
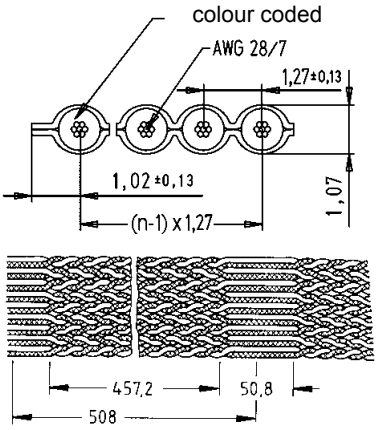
## Cables for insulation displacement termination

| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Flat cable**<br>colour coded<br><br>Length per reel<br>30.48 m (100 feet)<br><br>UL AWM-style 2651 | 6<br>9<br>10<br>14<br>15<br>16<br>18<br>20<br>24<br>25<br>26<br>28<br>30<br>34<br>37<br>40<br>50<br>60<br>64 | 09 18 006 7005<br>09 18 009 7005<br>09 18 010 7005<br>09 18 014 7005<br>09 18 015 7005<br>09 18 016 7005<br>09 18 018 7005<br>09 18 020 7005<br>09 18 024 7005<br>09 18 025 7005<br>09 18 026 7005<br>09 18 028 7005<br>09 18 030 7005<br>09 18 034 7005<br>09 18 037 7005<br>09 18 040 7005<br>09 18 050 7005<br>09 18 060 7005<br>09 18 064 7005 |  <br>Colour code sequence (in 10 steps)<br><br>brown, red, orange, yellow, green, blue, violet, grey, white, black<br><br> | Conductor material: Copper tinned<br>Gauge: AWG 28/7 0.09 mm²<br>Voltage rating: 300 $V_{r.m.s.}$<br>Current rating at 25 °C: 2.1 A max.<br>Conductor resistance: 221 mΩ/m<br>Capacity unbalanced: 42.7 pF/m<br>Impedance unbalanced: 105 Ω<br>Inductance unbalanced: 0.68 µH/m<br>Signal delay: 4.9 ns/m<br>Insulation material: PVC<br>Temperature rating (operating): -20 °C … +105 °C<br>Temperature rating (static): -30 °C … +105 °C<br>Flammability rating: UL: VW 1<br>Insulation resistance: 100 MΩ/km |
| **Flat cable**<br>twisted pair<br><br>Length per reel<br>30.48 m (100 feet)<br><br>UL AWM-style 20130 | 10<br>14<br>16<br>20<br>26<br>34<br>40<br>50<br>60<br>64 | 09 18 010 7006<br>09 18 014 7006<br>09 18 016 7006<br>09 18 020 7006<br>09 18 026 7006<br>09 18 034 7006<br>09 18 040 7006<br>09 18 050 7006<br>09 18 060 7006<br>09 18 064 7006 |  <br> | Conductor material: Copper tinned<br>Gauge: AWG 28/7 0.089 mm²<br>Voltage rating: 300 $V_{r.m.s.}$<br>Conductor resistance: 221 mΩ/m<br>Capacity unbalanced: 49 pF/m<br>Impedance unbalanced: 105 Ω<br>Signal delay: 5.2 ns/m<br>Insulation material: PVC<br>Temperature rating: -20 °C … +105 °C<br>Flammability rating: UL: VW 1<br>Insulation resistance: $10^4$ MΩ/km |

Important: always store reel vertically



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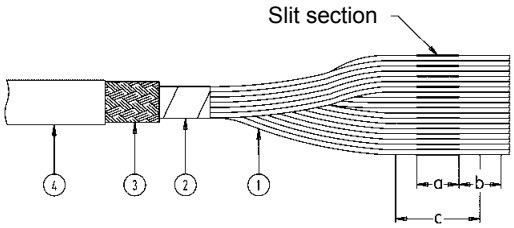
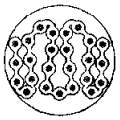
## Cables for insulation displacement termination

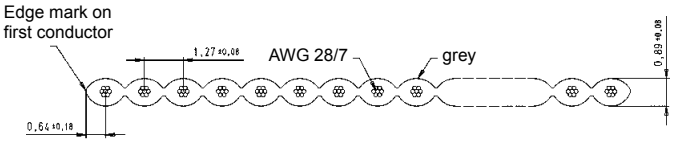
| Identification | No. of contacts | Part number | Drawing ø max. |
|---|---|---|---|
| **Round flat cable** | | | |
| with screening (shielding) | 9 | 09 18 009 70 ⌴ | 6.86 |
| | 10 | 09 18 010 70 ⌴ | 6.86 |
| | 14 | 09 18 014 70 ⌴ | 7.37 |
| UL listed PLCC CL2 | 15 | 09 18 015 70 ⌴ | 7.62 |
| CSA certified AWM FT-1 | 16 | 09 18 016 70 ⌴ | 7.87 |
| | 20 | 09 18 020 70 ⌴ | 8.38 |
| | 25 | 09 18 025 70 ⌴ | 9.14 |
| | 26 | 09 18 026 70 ⌴ | 9.14 |
| | 34 | 09 18 034 70 ⌴ | 10.16 |
| | 37 | 09 18 037 70 ⌴ | 10.41 |
| | 40 | 09 18 040 70 ⌴ | 10.92 |
| Length per reel | 50 | 09 18 050 70 ⌴ | 12.19 |
| | 60 | 09 18 060 70 ⌴ * | 13.21 |
| 30.48 m (100 feet) 07 | 64 | 09 18 064 70 ⌴ | 13.46 |
| 100 m (328 feet) 10 [1] | | | |
| without screening (shielding) | 9 | 09 18 009 7008 | 6.35 |
| | 10 | 09 18 010 7008 | 6.35 |
| | 14 | 09 18 014 7008 | 6.60 |
| UL listed PLCC CL2 | 15 | 09 18 015 7008 | 6.86 |
| CSA certified AWM FT-1 | 16 | 09 18 016 7008 | 7.11 |
| | 20 | 09 18 020 7008 | 7.62 |
| Length per reel | 25 | 09 18 025 7008 | 8.38 |
| 30.48 m (100 feet) | 26 | 09 18 026 7008 | 8.38 |
| | 34 | 09 18 034 7008 | 9.40 |
| | 37 | 09 18 037 7008 | 9.65 |
| | 40 | 09 18 040 7008 | 10.16 |
| | 50 | 09 18 050 7008 | 11.43 |
| | 60 | 09 18 060 7008 * | 12.45 |
| | 64 | 09 18 064 7008 | 12.70 |

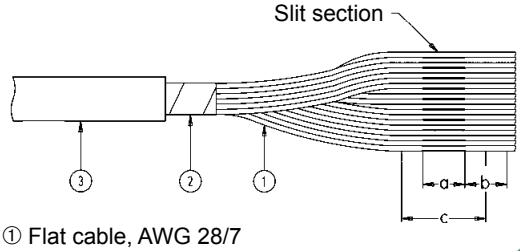
Dimensions in mm




① Flat cable, AWG 28/7
② Aluminium / Polyester tape (spiral wrap)
③ 85 % minimum coverage tinned copper braid
④ Outer jacket: black PVC






① Flat cable, AWG 28/7
② Clear polyester
③ Outer jacket: black PVC

| No. of contacts | a | b | c |
|---|---|---|---|
| 9 to 26 | 19.05 | 19.05 | 38.10 |
| 34 to 64 | 38.10 | 19.05 | 57.15 |

| | |
|---|---|
| Conductor material | Copper tinned |
| Gauge | AWG 28/7 0.089 mm² |
| Voltage rating | 300 $V_{r.m.s.}$ |
| Conductor resistance | 225 mΩ/m |
| Capacity unbalanced | 78.7 pF/m |
| Impedance unbalanced | 75 Ω |
| Signal delay | 5.25 ns/m nom. |
| Insulation material | PVC |
| Temperature rating | -20 °C … +105 °C |
| Flammability rating | UL: VW 1 |
| Insulation resistance | $10^4$ MΩ/km |

* Not normally kept in stock
[1] Only available for 10, 14, 37, 40 and 64 contacts
Important: always store reals vertically



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# Notes





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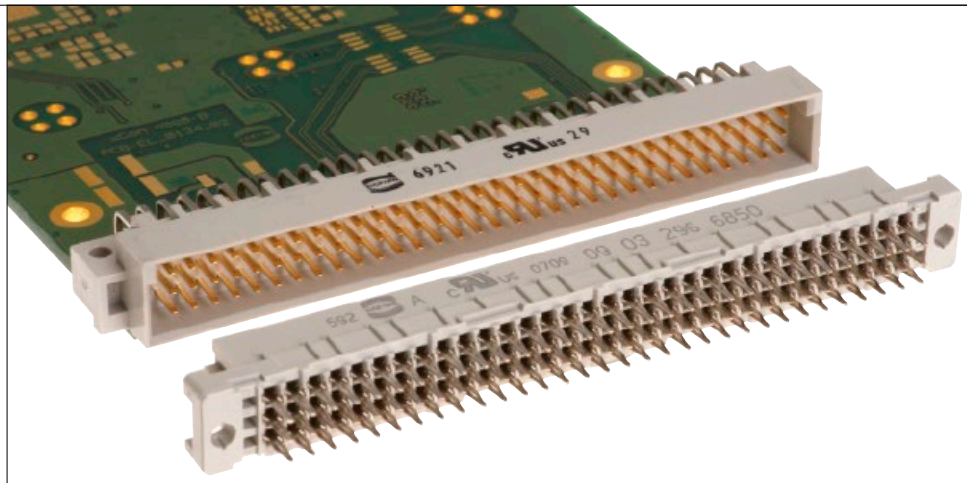
# 09. DIN 41 612 Connectors



Connectors that comply with DIN 41 612 have been in use for years for both board-to-board applications and cable-to-board applications. Their robustness and universality are legendary. The classic signal connectors are supplemented by power solutions for allowing insertion of up to 40 A. Plastic, metallized and full metal housings, used in combination with shielded or unshielded cables with a high number of poles, are available for cable-to-board connectors. HARTING offers a wide range of DIN 41 612 connectors and accessories. The following catalogue pages contain an extract from the DIN 41 612 connector program. The complete DIN 41 612 connector program for data, signals and power can be found in the complete DIN 41 612 catalogue.

*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● |

**Cable termination**

| *Han-Quick Lock®* | *IDC* | *Crimp* |
|---|---|---|
| | ● | ● |

| *Screw* | *Cage clamp* | *Axial screw* |
|---|---|---|
| | ● | |

**PCB termination**

| *THT* | *SMC* | *SMT* |
|---|---|---|
| ● | ● | |

| *Press-in* |
|---|
| ● |

**Application standard**

VMEbus Technology

**Housing integration**

| *Separate housing* | *Integrated housing* |
|---|---|
| ● | |

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## Contents


| | Page |
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| Overview DIN Signal | **09.04** |
| Overview *har-bus® 64* | **09.06** |
| Application examples | **09.07** |
| Overview DIN Power | **09.08** |
| Overview shell housings | **09.10** |
| Male and female connectors with pcb fixings | **09.11** |






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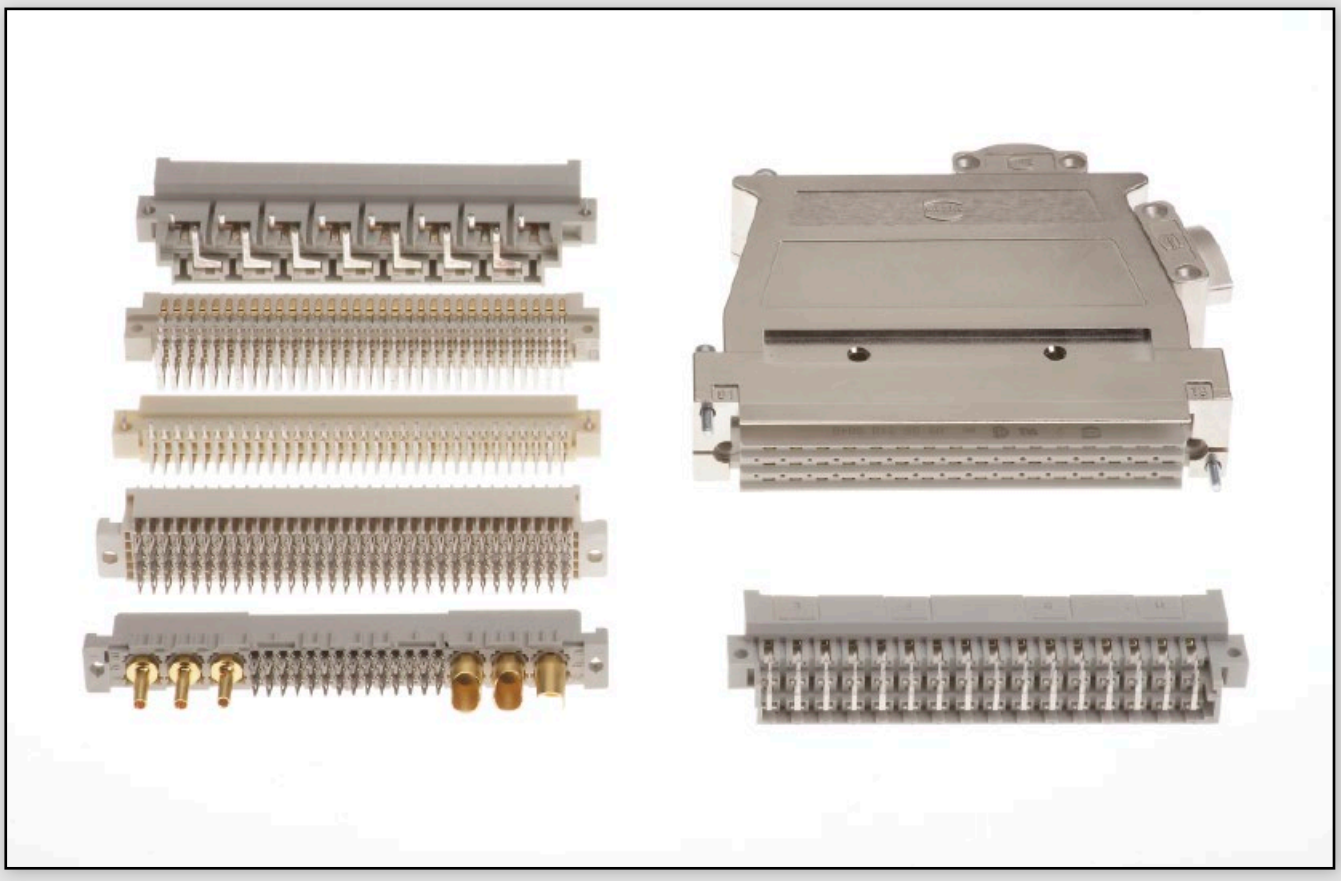
# 09. DIN 41 612 Connectors

In devices for industrial automation and measurement techniques, the DIN 41 612 connector is the standard for board-to-board and cable-to-board connections as both data and power connectors. HARTING offers a wide range of standard connectors complying with DIN 41 612 and IEC 60 603-2, as well as a great selection of complementary types and customer specific solutions. Depending on the application, the 3 to 160 way connectors are offered with various termination methods, each contact capable of carrying from 2 A to 40 A.

HARTING differentiates between DIN Signal and DIN Power connectors depending on the maximum allowed working current per contact: up to 2 A for DIN Signal and over 2 A for DIN Power connectors.

HARTING's range *har-bus® 64* features 160 contacts and is an extension of the 3 row 96 way DIN 41 612 C type range with 2 additional rows. The 5 row *har-bus® 64* connector is 100 % forwards and backwards compatible with the type C connectors according to DIN 41 612. The design of male and female connectors allows the mating of any combination of the 5 or the 3 row variants.







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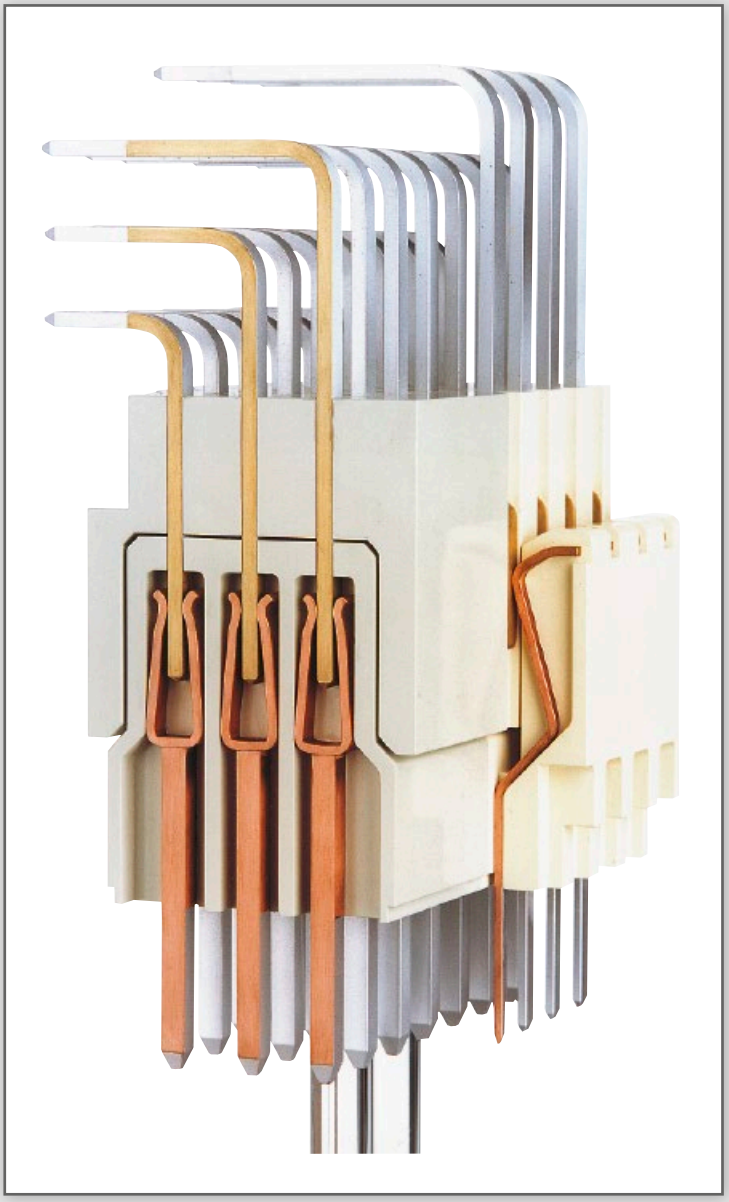
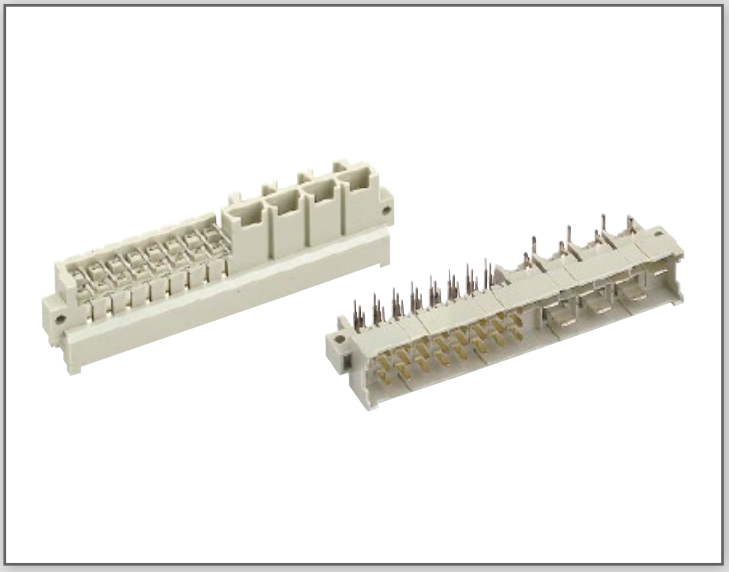
# Specific features of the product range

The design of the *har-bus® 64* female allows mating of any combinations of the 5 or 3 row standard male connectors. It is also possible to mate 5 row male connectors with 3 row female connectors.
This kind of backwards compatibility allows the user the staged transition to a higher performance category and simultaneous use of daughter cards in the slots of the previous generation.
Therefore all existing bus systems, for which the 3 row C96 pin connectors are no longer sufficient, can be adapted to the latest requirements without a complete system redesign.



Variety of DIN 41 612 types
Due to the large variety of complementary types, accessories and different kinds of shell housings which are available in plastic, metallized plastic and full metal, DIN 41 612 connector range is considered to be ideal for your robust, reliable and cost-efficient connectivity solution.
The special requirements of industrial electronics can be satisfied with standard types.







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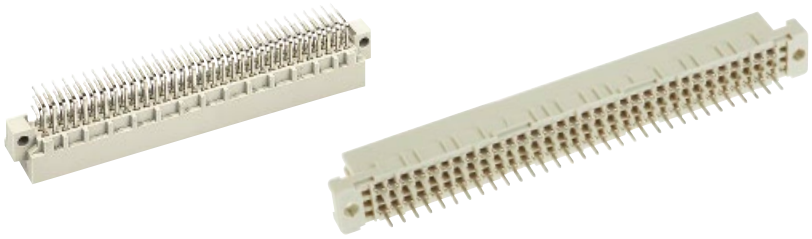
# DIN Signal overview



For detailed information see catalogue DIN 41612 or www.HARTING.com

| Type | Maximum number of contacts | | | Termination | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Solder | Reflow Soldering (SMC) | Solder lug | Press-in | Crimp | Wire wrap | IDC |
| B | 64 | | male | 3.0 mm | 3.0 mm | | | | | |
| | | | female | 2.9 mm<br>4.5 mm<br>13.0 mm | 2.9 mm<br>4.5 mm | X | 4.5 mm<br>13.2 mm | X | 13.0 mm | X |
| 2 B | 32 | | male | 3.0 mm | 3.0 mm | | | | | |
| | | | female | 2.9 mm<br>4.5 mm | 2.9 mm<br>4.5 mm | | 4.5 mm | | 13.0 mm | |
| 3 B* | 20 | | male | 3.0 mm | 3.0 mm | | | | | |
| | | | female | 2.9 mm<br>4.5 mm | 2.9 mm | | 4.5 mm | | | |
| C | 96 | | male | 3.0 mm | 3.0 mm | | | | | |
| | | | female | 2.9 mm<br>4.5 mm<br>13.0 mm | 2.9 mm<br>4.5 mm | X | 4.5 mm<br>13.2 mm<br>17.0 mm | X | 13.0 mm | X |
| 2 C | 48 | | male | 3.0 mm | 3.0 mm | | | | | |
| | | | female | 2.9 mm<br>4.5 mm<br>13.0 mm | 2.9 mm<br>4.5 mm | X | 3.7 mm<br>4.5 mm | X | 13.0 mm | |
| 3 C* | 30 | | male | 3.0 mm | 3.0 mm | | | | | |
| | | | female | 2.9 mm<br>4.5 mm | 2.9 mm | | 4.5 mm | X | | |
| M | 78 + 2<br>60 + 4<br>42 + 6<br>24 + 8 | | male | 3.0 mm | | | | | | |
| | | | female | 2.9 mm<br>4.5 mm | | | 4.5 mm | | | |

* Available with and without flange





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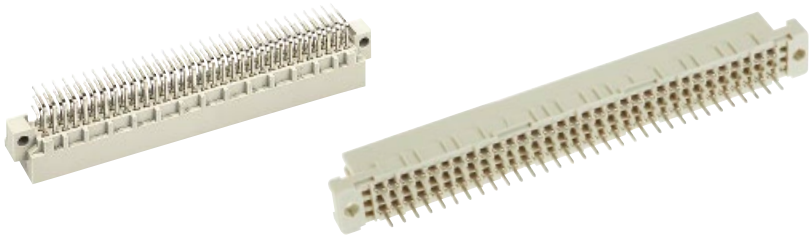
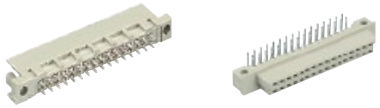
# DIN Signal overview



For detailed information see catalogue DIN 41612 or www.HARTING.com

| | | | | Termination | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Type | Maximum number of contacts | | | Solder | Reflow Soldering (SMC) | Solder lug | Press-in | Crimp | Wire wrap | IDC |
| M flat | 78 + 2<br>60 + 4<br>42 + 6<br>24 + 8 | | female | 2.9 mm<br>4.5 mm | | | 4.5 mm | | | |
| M inverse | 78 + 2<br>60 + 4<br>42 + 6<br>24 + 8<br>6 + 10 | | male | 2.5 mm<br>4.0 mm | | | 5.5 mm<br>13.0 mm | | 13.0 mm | |
| | | | female | 3.0 mm | | | | | | |
| Q | 64 | | male | 2.5 mm<br>4.0 mm<br>13.0 mm | | | 5.0 mm<br>13.0 mm | | 13.0 mm<br>17.0 mm | |
| | | | female | 3.0 mm | | | | | | |
| 2 Q | 32 |  | male | 2.5 mm<br>4.0 mm<br>13.0 mm | | | 5.0 mm | | 13.0 mm | |
| | | | female | 3.0 mm | | | | | | |
| 3 Q* | 20 | | male | 2.5 mm<br>4.0 mm<br>13.0 mm | 2.5 mm<br>4.0 mm<br>13.0 mm | | 5.0 mm<br>13.0 mm | | 13.0 mm | |
| R | 96 | | male | 2.5 mm<br>4.0 mm<br>13.0 mm | 2.5 mm<br>4.0 mm<br>13.0 mm | | 5.0 mm<br>13.0 mm | | 13.0 mm | |
| | | | female | 2.8 mm | 2.8 mm | | | | | |
| R (HE 11) | 96 | | male | 2.5 mm<br>4.0 mm | | | | | 13.0 mm | |
| | | | female | 2.9 mm | | | | | | |
| RM | 96 | | male | | | | 5.0 mm<br>13.0 mm | | | |
| 2 R | 48 | | male | 2.5 mm<br>4.0 mm<br>13.0 mm | 2.5 mm<br>4.0 mm<br>13.0 mm | | 5.0 mm<br>13.0 mm | | 13.0 mm | |
| | | | female | 3.0 mm | | | | | | |
| 3 R* | 30 | | male | 2.5 mm<br>4.0 mm<br>13.0 mm | 2.5 mm<br>4.0 mm<br>13.0 mm | | 5.0 mm<br>13.0 mm | | 13.0 mm | |

* Available with and without flange





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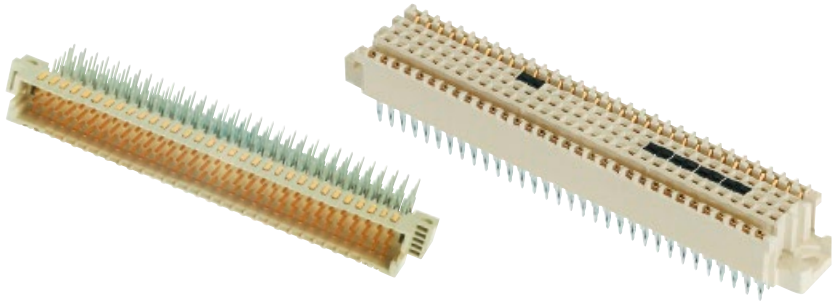
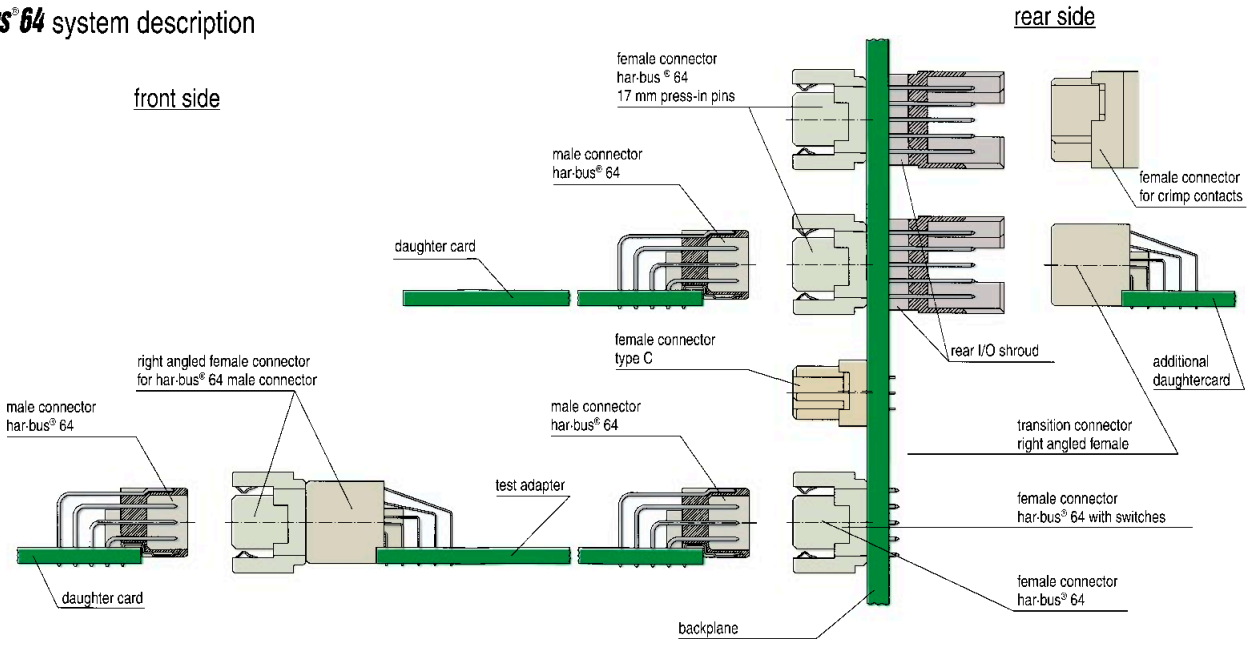
# har·bus® 64 overview



For detailed information see catalogue DIN 41612 or www.HARTING.com

| Type | Maximum number of contacts | | | Termination | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Solder | Reflow Soldering (SMC) | Solder lug | Press-in | Crimp | Wire wrap | IDC |
| har·bus® 64 | 160 | | male | 3.0 mm | 3.0 mm | | | | | |
| | | | female | 2.9 mm | | | 3.7 mm<br>5.0 mm<br>17.0 mm | X | | |
| | | | female with switches | | | | 4.5 / 5.0 mm | | | |

## har·bus® 64 system description




DIN 41612

## Technical characteristics DIN Signal / har·bus® 64

| | |
|---|---|
| Number of contacts | 16 – 160 |
| Contact spacing | 2.54 |
| Working current<br>(all contacts are loaded) | 2 A<br>1 A for har·bus® 64 at 70 °C<br>1 A with insulation displacement<br>40 A max. type M |
| Test voltage $U_{r.m.s}$ | 1 KV |
| Contact resistance | ≤ 15 mΩ for solder<br>and wire wrap connection<br>≤ 20 mΩ for crimp connection<br>≤ 20 mΩ har·bus® 64 rows a,b,c<br>≤ 30 mΩ har·bus® 64 rows z,d |
| Insulation resistance | ≥ $10^{10}$ Ω har·bus® 64<br>≥ $10^{12}$ Ω DIN Signal |
| Temperature range | -40 °C ... +105 °C<br>for press-in connectors<br>-55 °C ... +125 °C<br>max. + 240 °C for 15 s during<br>reflow soldering (only SMC) |

| | |
|---|---|
| Insertion and withdrawal force | 16-pol. ≤ 15 N<br>30-pol. ≤ 30 N<br>32-pol. ≤ 30 N<br>48-pol. ≤ 45 N<br>64-pol. ≤ 60 N<br>96-pol. ≤ 90 N<br>160-pol. ≤ 160 N |
| Materials | |
| Mouldings | thermoplastic resin,<br>glass-fibre filled, UL 94-V0<br>Liquid Cristal Polymer (LCP),<br>UL 94-V0<br>Poly Cyclohexylene Terephthalate<br>(PCT), UL 94-V0<br>NFF classification up to F1/I2 |
| Contacts | copper alloy |
| Contact surface | |
| Contact zone | selectively plated according<br>to performance level |



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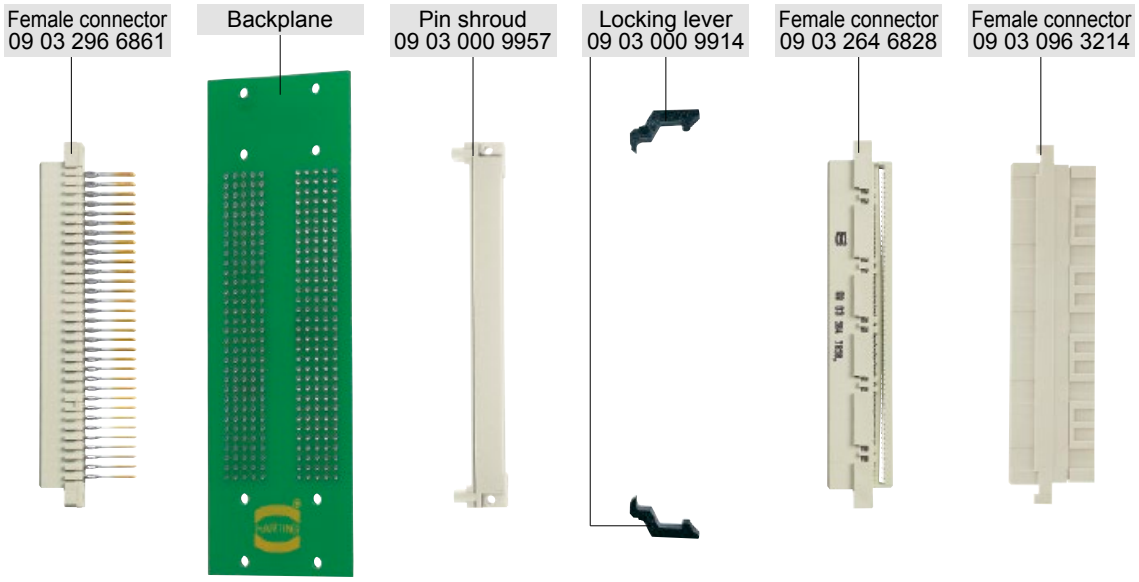
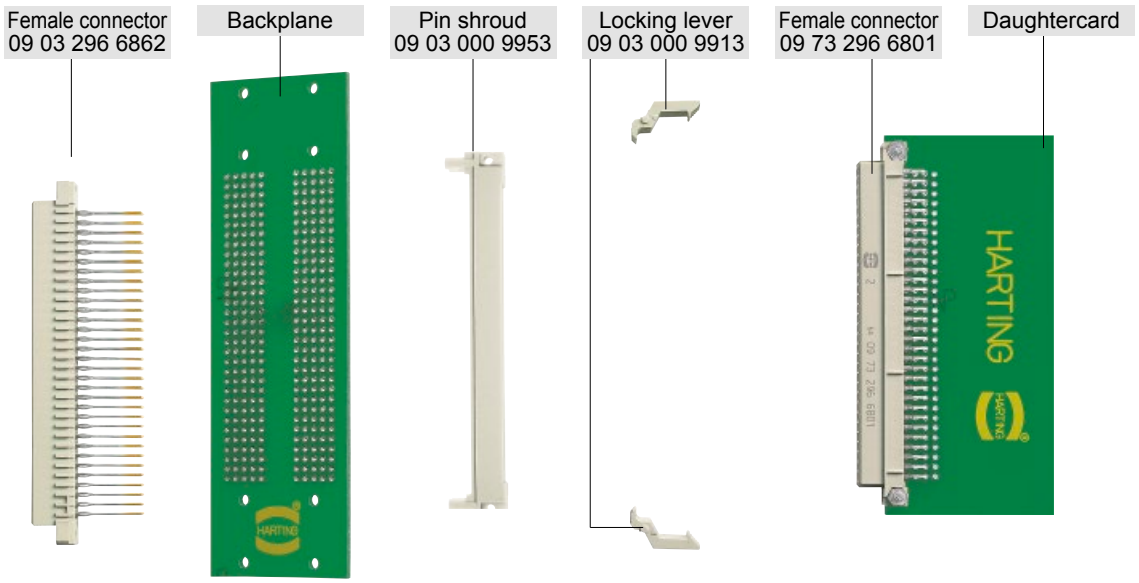
# Application examples

## Application 1

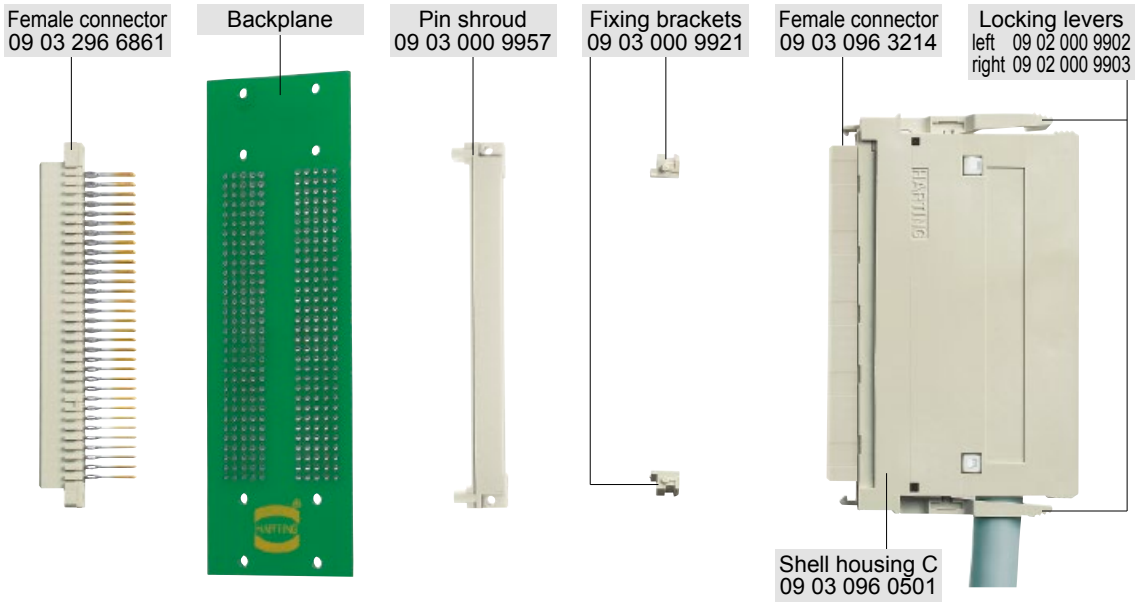



## Application 2




DIN 41612

## Application 3



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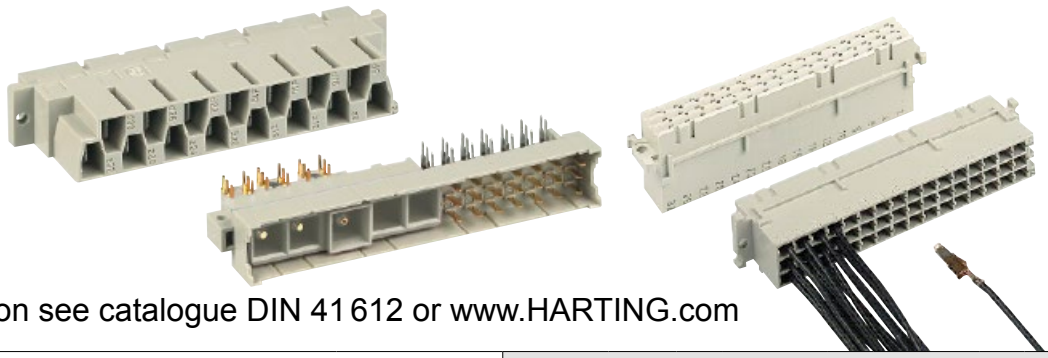
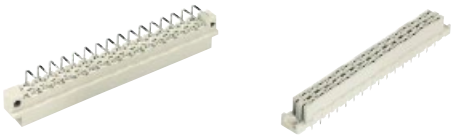
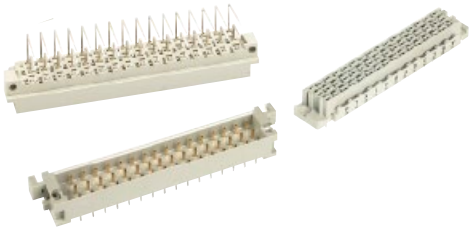
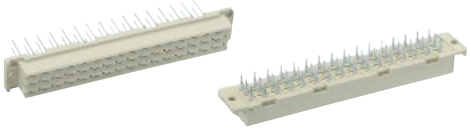
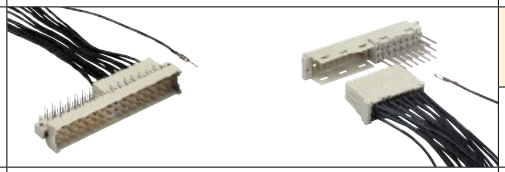
# DIN Power overview



For detailed information see catalogue DIN 41612 or www.HARTING.com

| Type | Maximum number of contacts | | | Termination | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Solder | Reflow Soldering (SMC) | Solder lug | Press-in | Crimp | Wire wrap | Faston | Cage clamp |
| D | 32 |  | male | 3.0 mm | X | | | | | | |
| | | | female | 2.9 mm<br>4.5 mm | | X | | X | 20.0 mm | | |
| E | 48 |  | male | 3.0 mm | X | | | | | | |
| | | | female | 2.9 mm<br>4.5 mm | | X | 4.5 mm<br>11.5 mm | X | 20.0 mm | | |
| | | | Interface connector I | 4.0 mm | | | | | | | |
| F | 48 | | male | 3.0 mm | X | | | | | | |
| | | | female | 3.7 mm<br>4.5 mm | | X | | X | 22.0 mm | | |
| F<br>Low<br>profile | 48 |  | female | 3.7 mm<br>4.5 mm | | | 4.5 mm<br>13.0 mm | | | | |
| | | | Interface connector I | 3.5 mm | | | | X | 22.0 mm | | |
| F 9 | 9 | | male | | | | | X | | | |
| | | | female | | | | | X | | | |
| FM | 45 |  | male | 3.0 mm | | | | X | | | |
| | | | female | 4.5 mm | | | | X | 22.0 mm | | |
| 2 F | 24 | | female | | | | | X | | | |
| | | | Interface connector I | | | | | X | | | |

DIN 41612



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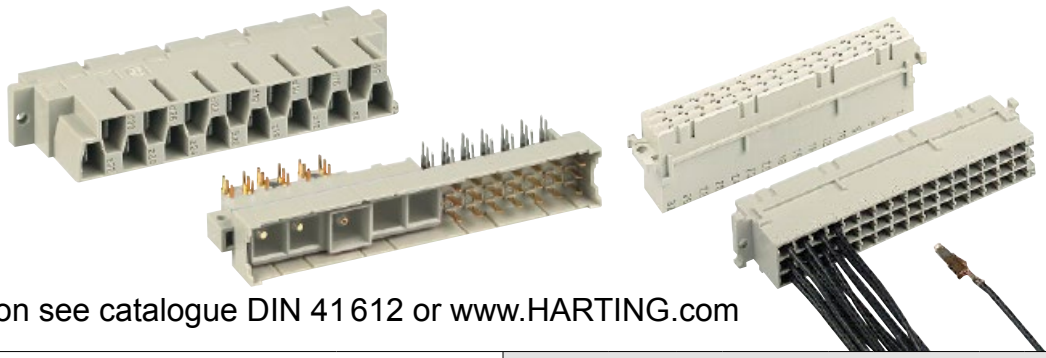
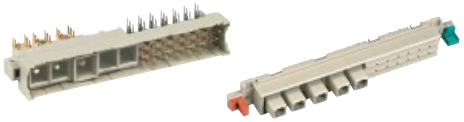
# DIN Power overview



For detailed information see catalogue DIN 41612 or www.HARTING.com

| Type | Maximum number of contacts | | | Termination | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Solder | Reflow Soldering (SMC) | Solder lug | Press-in | Crimp | Wire wrap | Faston | Cage clamp |
| H | 15 | | male | 3.0 mm | | | | | | X | |
| | | | female | 2.7 mm<br>4.0 mm<br>5.5 mm<br>7.0 mm<br>10.0 mm | | | 3.6 mm | | | X | X |
| H | 16 | | male | 3,0 mm | | | | | | | |
| | | | female | | | | | | | X | |
| H 3 | 3 | | male | 3.0 mm | | | | | | | |
| | | | female | 4.0 mm | | | | | | | |
| MH | 24 + 7 | | male | 3.0 mm | | | | | | X | |
| | | | female | 4.5 mm | | | | X | 22.0 mm | | |
| MH | 21 + 5 |  | male | 3.1 mm | | | | | | | |
| | | | female | 3.2 mm | | | | | | | |

# Technical characteristics DIN Power

| | |
|---|---|
| Number of contacts | 3 – 48 |
| Contact spacing | 5.08 mm; 2.54 mm |
| Working current (all contacts are loaded) | |
| Type D, E, F, F9, FM, 2F | 6 A max. |
| Type H, H 3 | 15 A max. |
| Test voltage $U_{r.m.s}$ | |
| Type D, E, F, F9, FM, 2F | ≥ 1.55 KV |
| Type H | ≥ 3.1 KV |
| Type H 3 | ≥ 2.5 KV |
| Contact resistance | ≤ 15 mΩ Solder and Wire wrap connection<br>≤ 20 mΩ Crimp connection |
| Insulation resistance | ≥ $10^{12}$ Ω |
| Temperature range | -40 °C ... +105 °C<br>Press-in connector<br>-55 °C ... +125 °C<br>max. + 240 °C for 15 s during reflow soldering (only SMC) |

| | |
|---|---|
| Insertion and withdrawal force | |
| Type D, E | 32-pol. ≤ 40 N<br>48-pol. ≤ 75 N |
| Type F, F9, FM, 2F | 24-pol. ≤ 37 N<br>32-pol. ≤ 50 N<br>45-pol. ≤ 70 N<br>48-pol. ≤ 75 N |
| Type H | ≤ 90 N |
| Type H 3 | ≤ 20 N |
| Materials | |
| Mouldings | thermoplastic resin, glass-fibre filled, UL 94-V0<br>Poly Cyclohexylene Terephthalate (PCT), UL 94-V0<br>NFF classification up to F1/I2 |
| Contacts | copper alloy |
| Contact surface | |
| Contact zone | selectively plated according to performance level<br>hard silver plated or gold plated |





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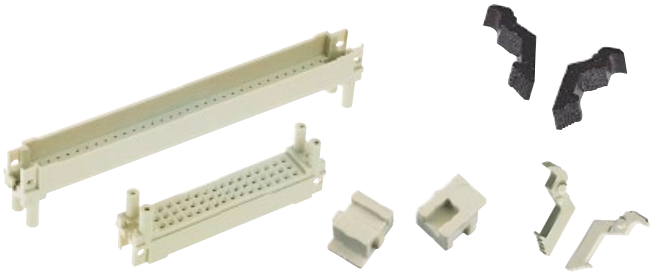
# Shell housing overview

For detailed information
see catalogue DIN 41612 or www.HARTING.com

DIN 41612

| | | Shell housings | | | | | | | | | | Open hood | | Junction element O | Locking lever O |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | B | C | 2C | 3C | D15 | D20 | D20 metallized | D20 metal | A for 2F | 2F | G | | |
| Number of cable entries | | 2 | 4 | 4 | 3 | 3 | 2 | 4 | 4 | 4 | 1 | 2 | 4 | 2 | 2 |
| for screw fixing | | X | X | X | X | X | X | X | X | X | X | X | X | X | |
| for fixing with locking lever | | X | X | X | X | X | X | | | | | | | | X |
| for straight pcb connector | | | | X | X | X | | | | | | | | | |
| for front side of the rack | | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| for pin shrouds | | | | X | X | | | | | | | | | | |
| for Interface connector I or U | | X | X | X | | | X | | | | X | X | X | X | |
| EMC | | | | | | | | | X | X | | | | | |
| IP20 | | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Coding included in shell housing | | | | | | | | X | X | X | | | | | |
| for types | B / Q | | | X | | | | | | | | | | | |
| | 2C / 2R | | | | X | | | | | | | | | | |
| | 3C / 3R | | | | | X | | | | | | | | | |
| | C / R | | | X | | | | | | | | | | | |
| | harbus® 64 | | | X | | | | | | | | | | | |
| | D | | | X | | | | | | | | | | | |
| | E | | | X | | | | | | | | | X | | |
| | F | X | X | | | | X | X | X | X | | | X | X | X |
| | 2F | | | | | | | | | | X | X | | | |
| | H | | X | | | | X | X | X | X | | | X | | X |
| | MH | | X | | | | X | X | X | X | | | X | | X |

| Pin shrouds | for types | | | | | | |
|---|---|---|---|---|---|---|---|
| | C | 2C | R | 2R | harbus® 64 | E | F |
| screw fixing | X | X | X | X | | | X |
| press-in fixing | X | X | X | X | X | X | X |





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## Snap-in clips

In the soldering process, all component terminations including the snap-in clips are soldered and therefore mechanically secured. This provides mechanical protection for the soldered contacts during mating and unmating of the connector.

Mouldings with snap-in clips offer the following advantages:

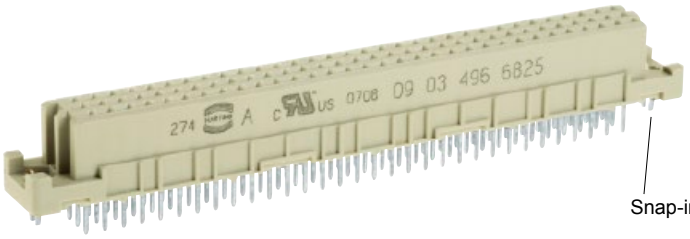
- Cost reduction when compared with the screw or rivet assembly methods due to the soldering of the clip along with other components in one process.
- The orientation of the clip after soldering in the plated through hole provides mechanical protection against the tensile forces arising from the mating and unmating of the connector.

It is possible to supply the majority of male and female connectors with solder termination with snap-in clips.

For pcb thickness
1.6 ± 0.2 mm
Ø = 2.8 $^{+0.1}$ mm

Mounting force
40 - 60 N

For pcb thickness
1.6 - 4.0 mm
Ø = 2.8 $^{+0.1}$ mm



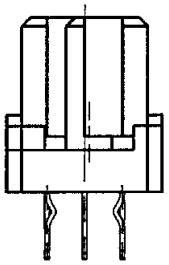

Snap-in clip

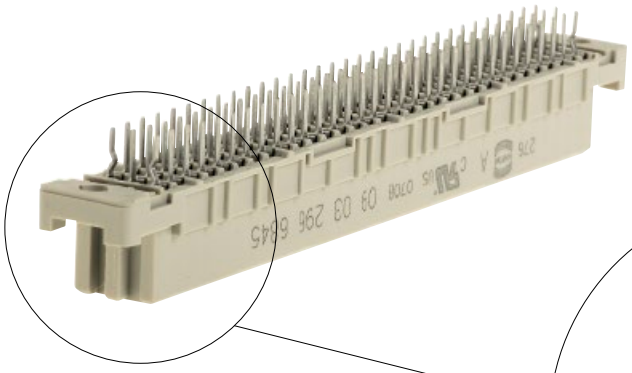
DIN 41612

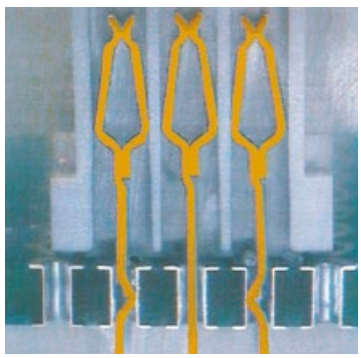
## Kinked pins

Before and during soldering, the connectors are fixed onto the pcb with four kinked contacts located in the rows a and c, e.g. the positions a1, c1, a32 and c32 for a fully loaded connector.

Connectors with kinked pins are a reliable alternative for female connectors with straight terminations because no additional elements like screws, rivets or clips are necessary.







Cross section of a connector with kinked contacts assembled to a pcb



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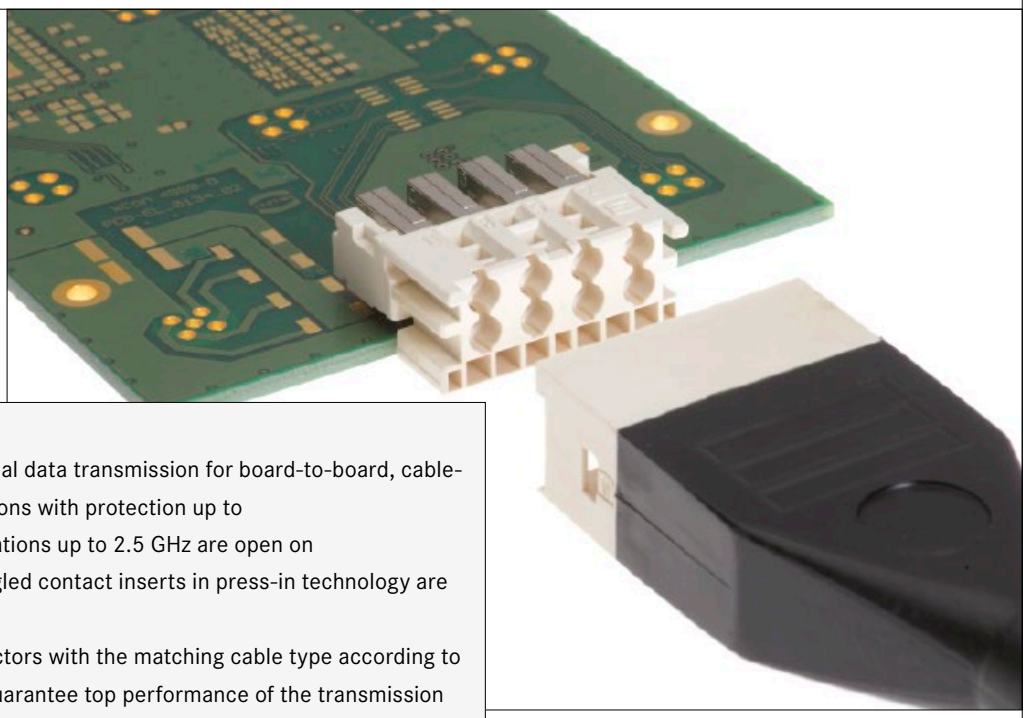
# 10. Mini Coax Connectors



The Mini Coax allows multi-pole coaxial data transmission for board-to-board, cable-to-board and cable-to-cable applications with protection up to IP65 / IP67. At the same time, applications up to 2.5 GHz are open on the basis of 50 Ohm. Straight and angled contact inserts in press-in technology are available for device integration.

HARTING assembles Mini Coax connectors with the matching cable type according to customer specifications in order to guarantee top performance of the transmission lines. A special feature is the connector overmolding, which guarantees a top quality and robust connection between the cable and connector.

*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| ● | ● | ● | | | ● | | ● | ● | | |

**Cable termination**

| *Han-Quick Lock®* | *IDC* | *Crimp* |
|---|---|---|
| | | ● |

| *Screw* | *Cage clamp* | *Axial screw* |
|---|---|---|
| | | |

**PCB termination**

| *THT* | *SMC* | *SMT* |
|---|---|---|
| | | |

| *Press-in* |
|---|
| ● |

**Application standard**

**Housing integration**

| *Separate housing* | *Integrated housing* |
|---|---|
| ● | |

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## Contents


| | Page |
|---|---|
| Mini Coax connector system – introduction | **10.02** |
| Mini Coax connector system – general information | **10.04** |
| Technical characteristics | **10.06** |
| Straight Mini Coax Standard modules for backplane assembly | **10.08** |
| Angled Mini Coax Standard modules for daughtercard assembly | **10.09** |
| Angled Mini Coax single-row modules for daughtercard assembly | **10.10** |
| Mini Coax cable assemblies – general information | **10.11** |
| Assemblies with standard modules | **10.12** |
| Assemblies with single-row modules and with heavy duty hoods/housings | **10.14** |
| Accessories | **10.15** |






Mini Coax tooling see chapter 20

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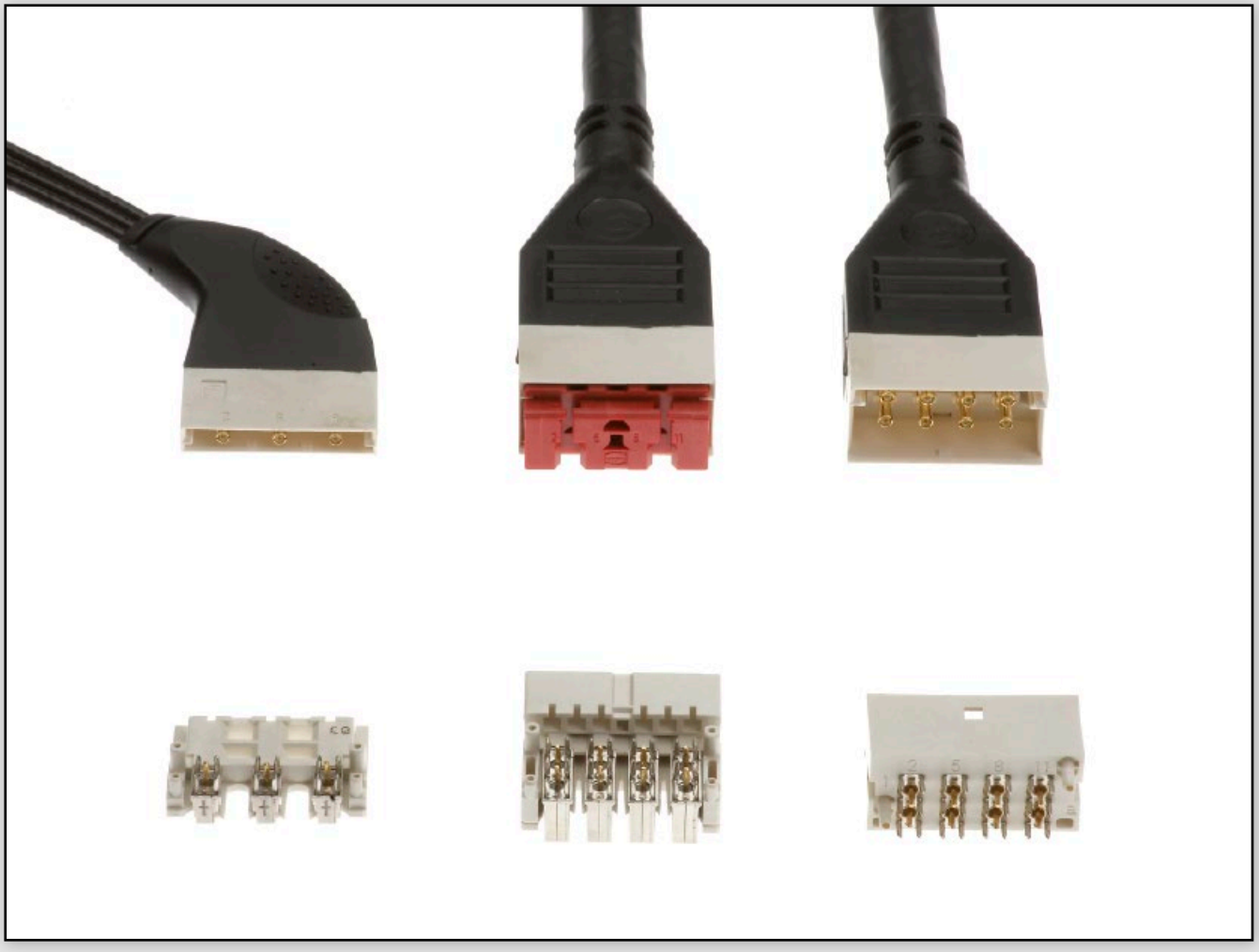
## MULTI-COAXIAL CONNECTOR SYSTEM MINI COAX

The HARTING multi line Mini Coax connector system for board-to-backplane RF interconnection includes connectors for press-in technology with 1 to 10 coaxial lines.
The Mini Coax connector range allows transmission of analogue signals in various applications like cellular base transceiver stations (BTS), repeaters and passenger entertainment systems at radio frequencies up to 2.5 GHz per line at 50 Ohm.
Moreover, these compact and rugged connectors provide a 6 Sigma mating reliability thanks to the closed-entry contact design. The compact size of Mini Coax modules (minimum pitch of RF lines is 4.4 mm), combined with excellent RF-performance, makes this connector system especially suitable for high-end equipment.
The twin modules are available in metric sizes of 1.00, 1.25 and 1.50 SU (SU = System Unit = 25 mm) for both cable assemblies and PCBs with 2 to 10 coaxial lines, as well as a single row version with 1 to 3 coaxial lines.
HARTING offers customised cable assemblies including adaptor cables to the most popular discrete coaxial contacts such as SMA, SMB, BNC, N-Type, etc. A complete range of accessories and tools supports the wide product range.







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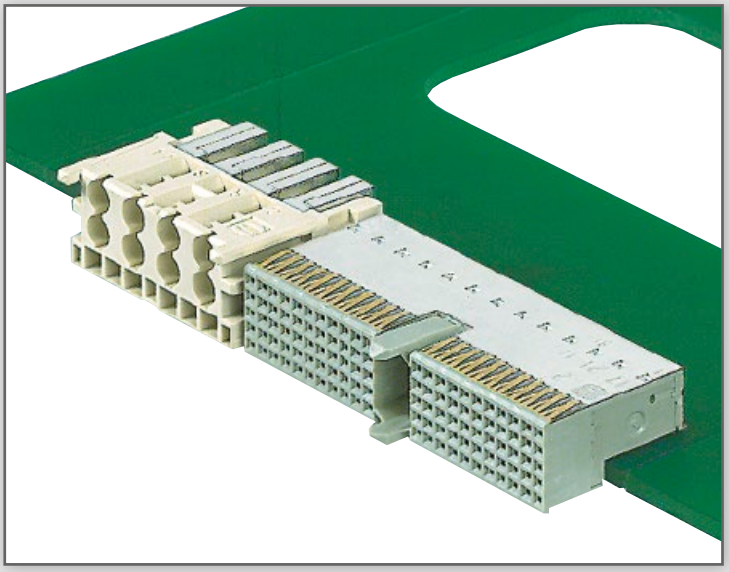
# Specific features of the product range

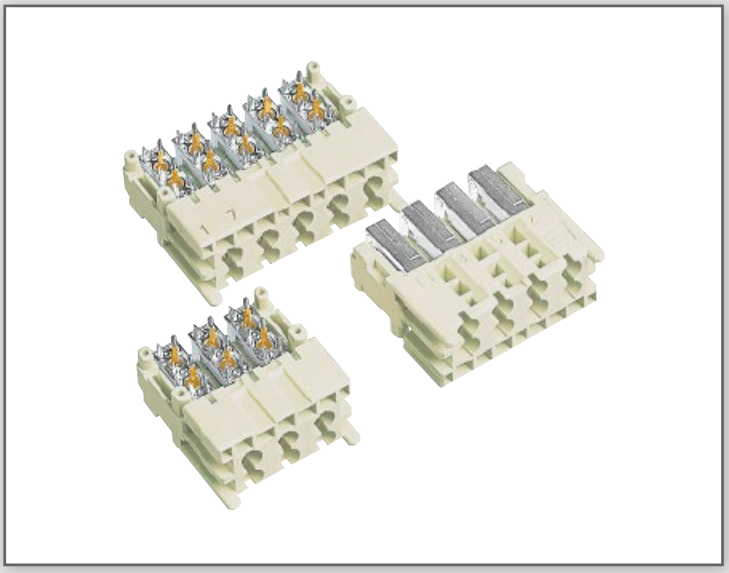
### CAN BE USED IN MIXED CONFIGURATION

As board-to-board connectors Mini Coax and *har-bus® HM* connectors can be used on board in any mixed configuration.



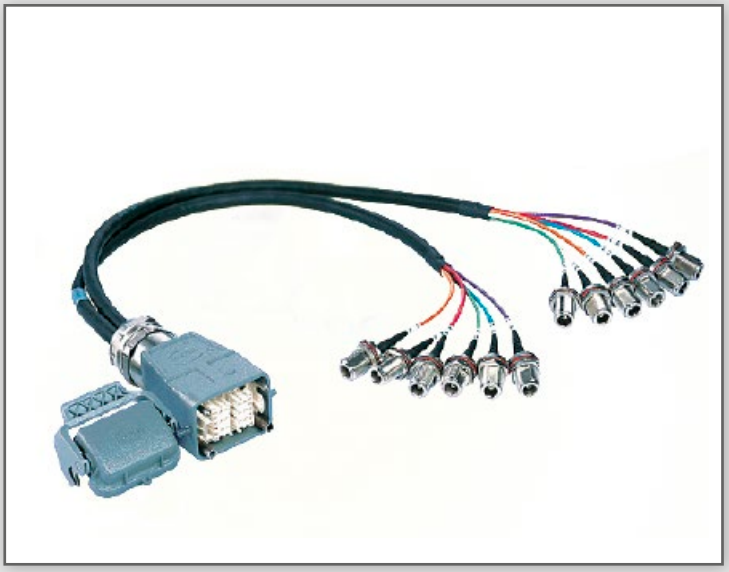
### HIGH DATA TRANSMISSION RATE

The press-in termination offers an easy processing with very high frequency rates up to 2.5 GHz (even 4.5 GHz with the single row connector).



### IP65 ENVIRONMENT

The combination of a Mini Coax connector with a Han® housing results in a proper IP65 Industrial Mini Coax connector.







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The Mini Coax connector is a multi line RF connector for blind mating of board-to-board, board-to-cable or cable-to-cable applications. The Mini Coax connector is mainly used in both RF (Radio Frequency) and IF (Intermediate Frequency) signal transmission and is specified for a frequency range from DC to 2.5 GHz and beyond. Thanks to its compact size (a 10 coaxial contacts' connector is as small as a PC's enter key) and excellent crosstalk features, this connector system is ideal for high end equipment within cellular telecom infrastructure.

The isolated coaxial lines are implemented in a plastic housing that defines the module size in a metric scale from 1.00, 1.25 and 1.50 SU (SU = System Unit = 25 mm). The Mini Coax connectors are available as straight sockets and right angled plugs. Both types are executed in press-in technology for the PCB (Printed Circuit Board) termination. The straight modules are delivered with an inserted plastic cap that protects the coaxial contacts against dust and dirt, as well as being used as an upper press-in tool. In this way, an easy and safe flat rock process is guaranteed.

The contacts of the Mini Coax single-row connector are single line, as opposed to the standard connector. This delivers enhanced performance, especially in terms of isolation, and is also suitable for slim cabinet applications.

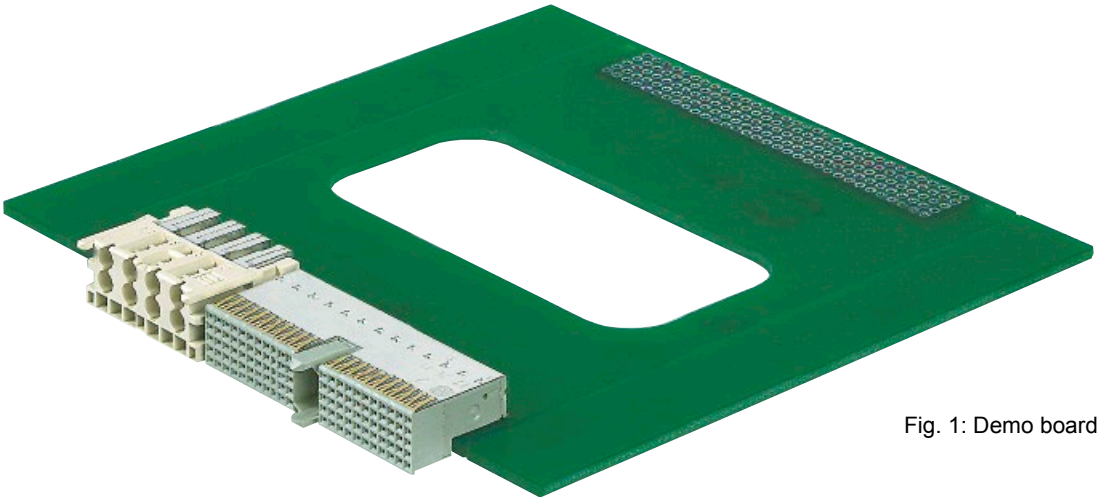

Fig. 1: Demo board

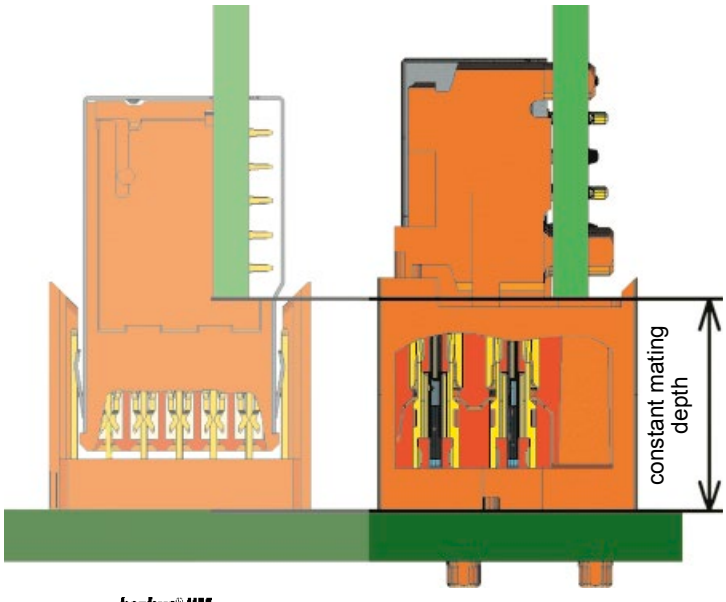


Fig. 2: Cross section of both connector types



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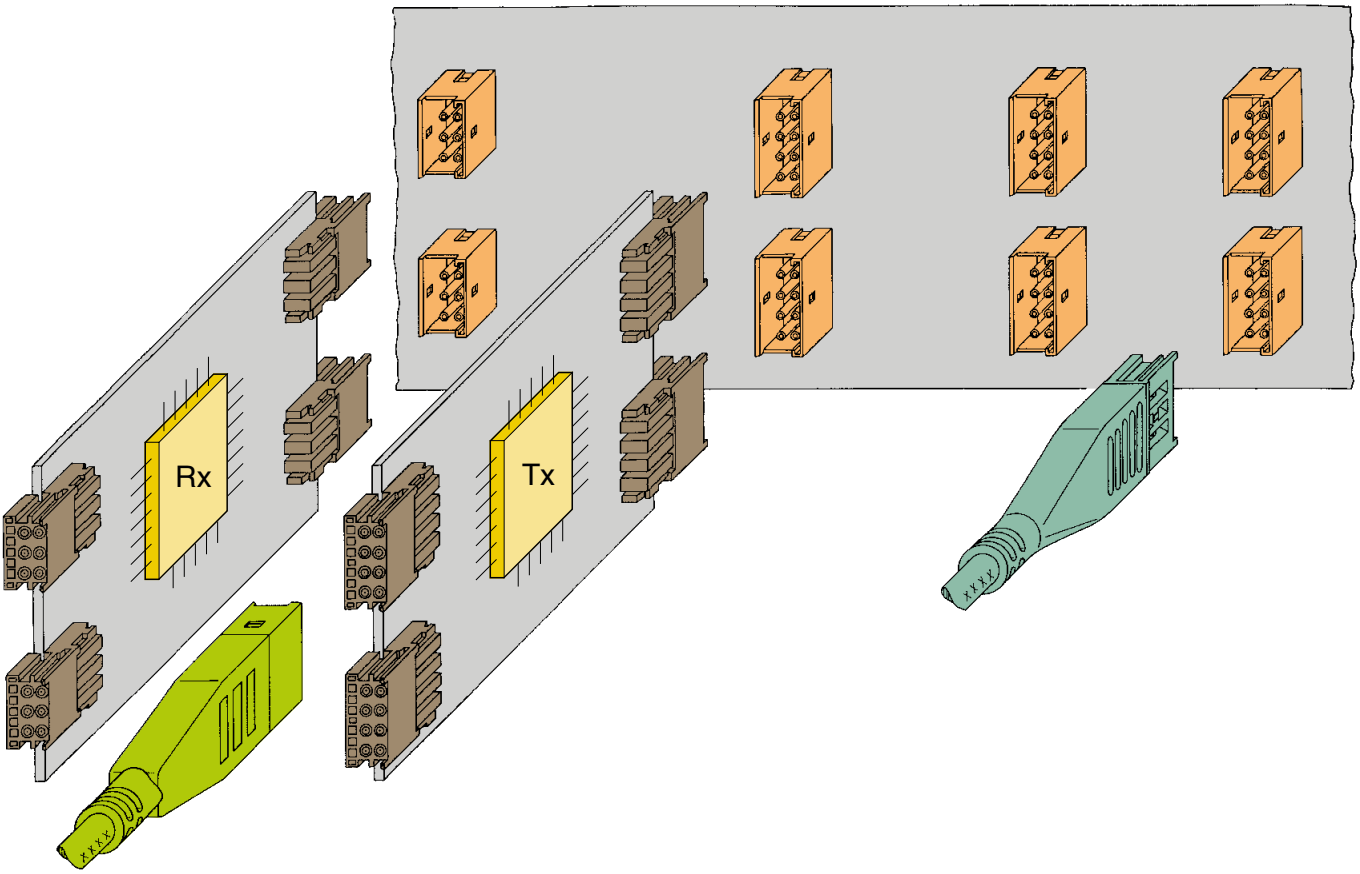


Fig. 3: Typical pcb configurations

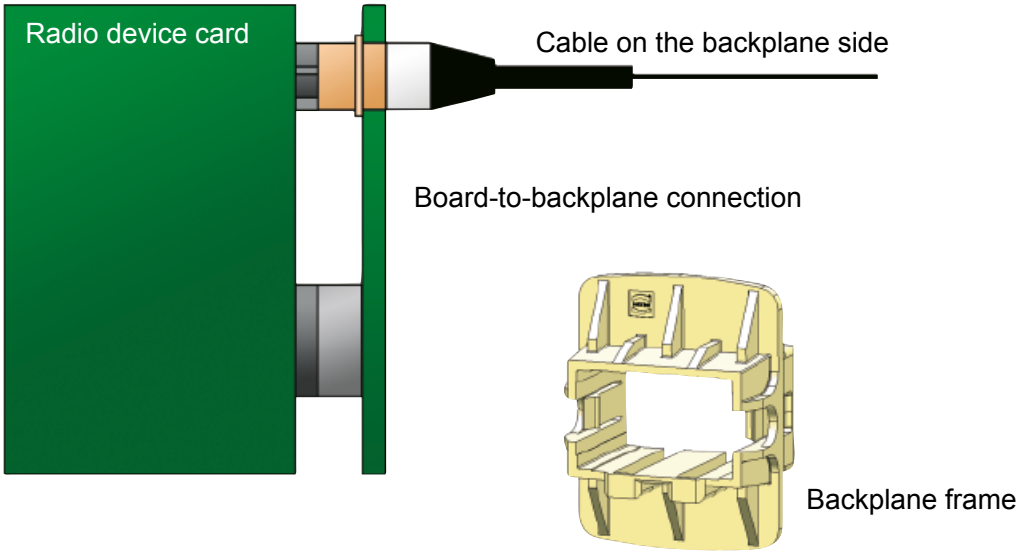


Fig. 4: Mini Coax backplane feed through





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| | | |
|---|---|---|
| Number of contacts | : | 1, 2, 4, 6, 8 or 10 coaxial contacts |
| Grid pattern | : | 4.40 x 6.25 mm (within a twin x between twins);<br>8.80 mm for Mini Coax single-row connectors |
| Dielectric withstanding Voltage $U_{r.m.s.}$ | : | ≤ 1000 V (for 60 s) |
| DC-contact resistance | | |
| Centre contact | : | ≤ 12 mΩ |
| Ground contact | : | ≤ 6 mΩ |
| Insulation resistance | : | ≥ 5000 MΩ |
| Power | : | ≤ 40 W (at 2.5 GHz) |
| Frequency range | : | DC … 2.5 GHz |
| Nominal impedance | : | 50 Ω |
| Return loss | : | < - 20 dB |
| VSWR | : | < 1.22 |
| Insertion loss | : | < 0.25 dB |
| Near end crosstalk (NEXT) | : | |

| Pin distance | Board-to-Board | Board-to-Cable | Cable-to-Cable |
|---|---|---|---|
| Δx = 4.40 mm | 50 dB | 60 dB | 90 dB |
| Δx = 6.25 mm | 60 dB | 70 dB | 90 dB |
| Δx = 7.64 mm | 75 dB | 80 dB | 90 dB |
| Δx = 8.80 mm | – | 75 dB | – |
| Δx = 12.50 mm | 90 dB | 90 dB | 90 dB |

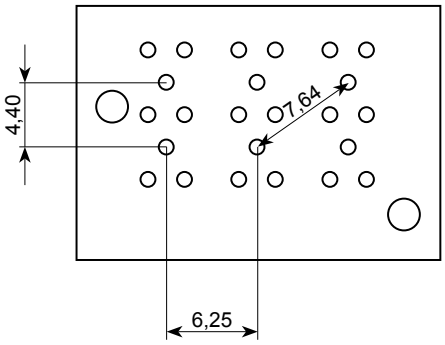


Fig. 5: Grid pattern
Mini Coax Standard

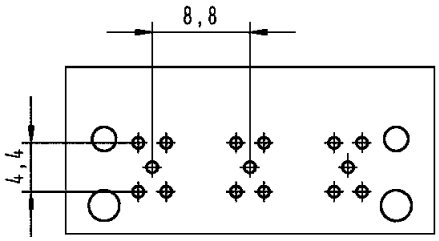


Fig. 6: Grid pattern
Mini Coax single-row

| | | |
|---|---|---|
| Temperature range | : | -55 °C ... +125 °C |
| Moulding material | : | Liquid Cristal Polymer (LCP), UL 94-V0 |
| Contact surface | | |
| Contact zone | : | Au |
| Termination area | | |
| Centre pin | : | Au |
| Ground pin | : | Ni |





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Mating cycles : max. 500

Recommended configuration of plated through holes :

| | | |
|---|---|---|
| *Tin plated PCB (HAL) acc. EN 60352-5* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Sn | max. 15 µm |
| | Plated hole-Ø | 0.94-1.09 mm |
| *Chemical tin plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Sn | min. 0.8 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *Au / Ni plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Ni | 3-7 µm |
| | Au | 0.05-0.12 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *Silver plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Ag | 0.1-0.3 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *OSP copper plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Plated hole-Ø | 1.00-1.10 mm |

PCB board thickness: ≥ 1.6 mm

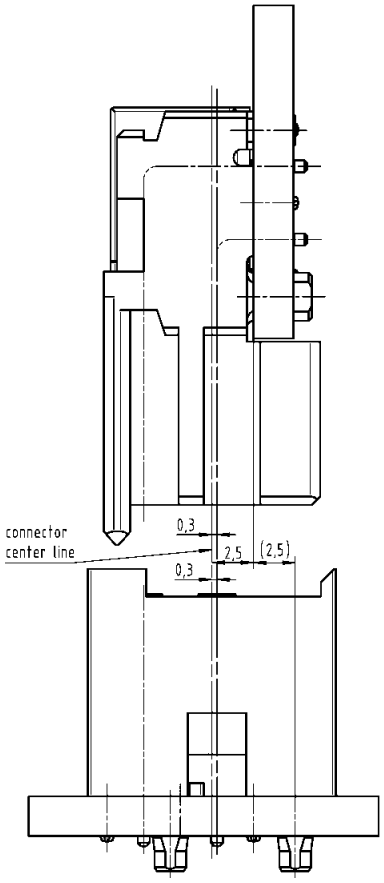
Mating force : ≤ 10 N/contact

Withdrawal force : > 1 N/contact

Mating distance : 12.5 … 15 mm

Wiping length : 2.5 mm

Acceptable radial mating offset : max. ± 1.5 mm





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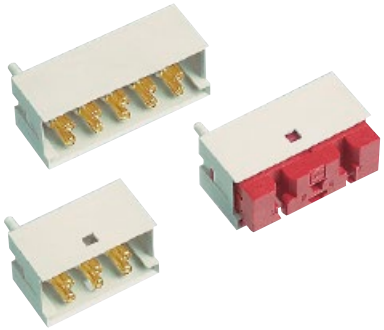
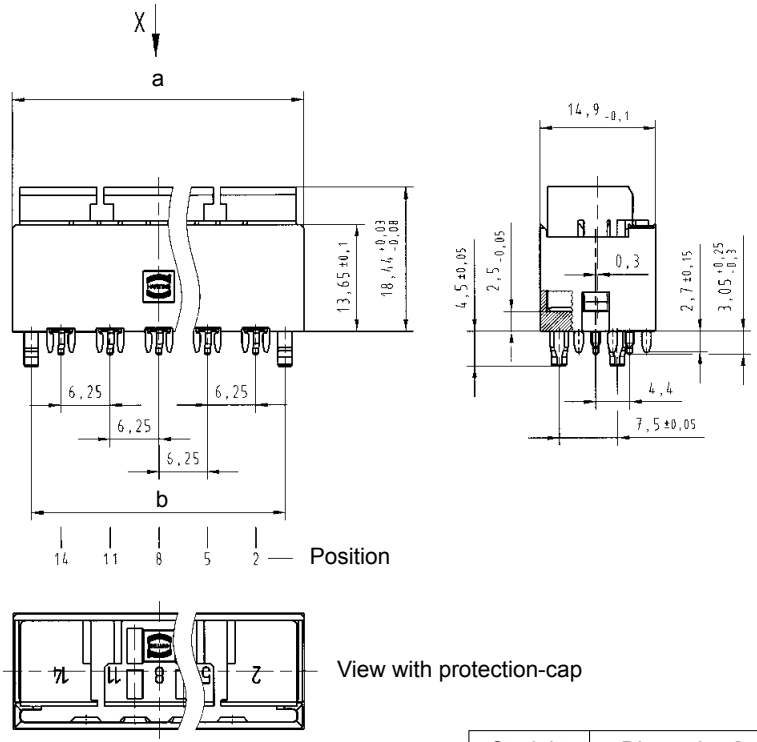


## Straight modules

| Identification | Number of contacts | SU | loaded positions | Part number |
|---|---|---|---|---|
| Mini Coax modules, press-in termination | 10 | 1.50 | 2, 5, 8, 11, 14 | 07 11 100 0026 |
| | 8 | 1.25 | 2, 5, 8, 11 | 07 11 100 0024 |
| | 6 | 1 | 2, 5, 8 | 07 11 100 0023 |
| | 4 | 1 | 2, 8 | 07 11 900 0024 |
| | 2 | 1 | 2 | 07 11 900 0023 |

### Dimensions



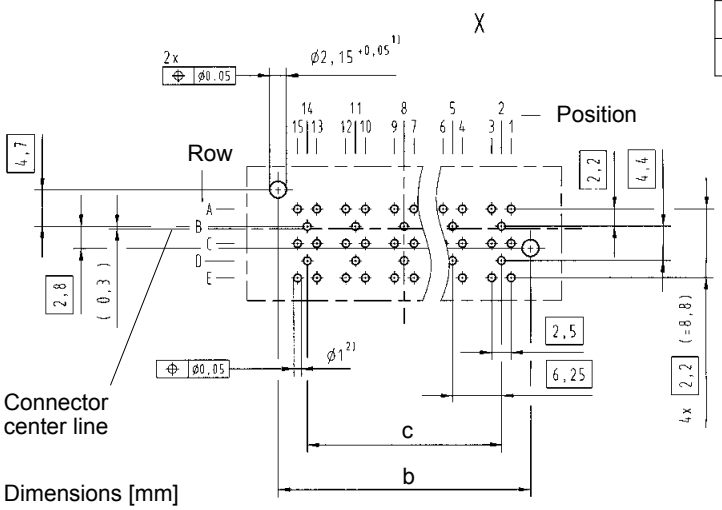




View with protection-cap

| Straight module | Dimension [mm] a | b | c |
|---|---|---|---|
| 1.50 SU | 37.3 | 32.5 | 25 |
| 1.25 SU | 31.05 | 26.25 | 18.75 |
| 1.00 SU | 24.8 | 20 | 12.5 |

### Board drillings




Row B, D: position 2, 5, 8, 11, 14 for signal line

Row A, C, E: position 1, 3, 4, 6, 7, 9, 10, 12, 13, 15 for ground-line

1) Non-metallised drillings

2) Details see page 10.07



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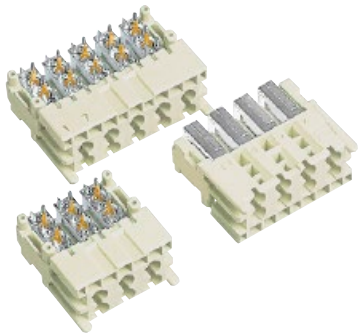
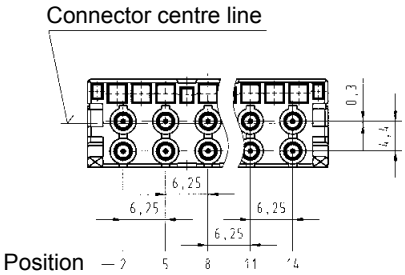
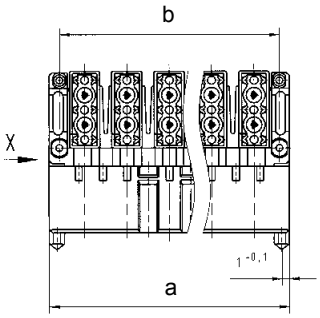


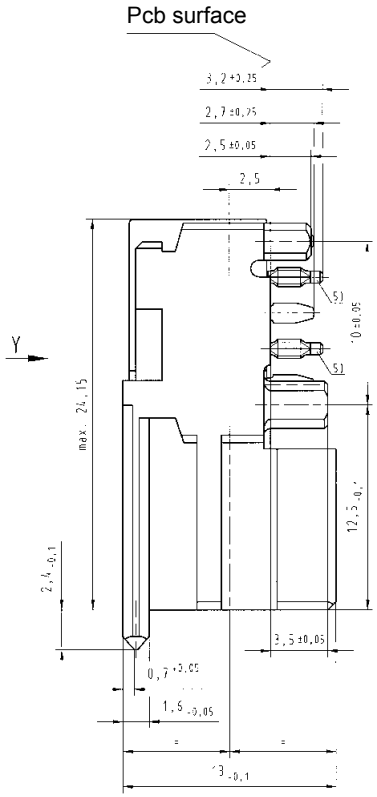
## Angled modules

| Identification | Number of contacts | SU | loaded positions | Part number |
|---|---|---|---|---|
| Mini Coax modules, press-in termination | 10 | 1.50 | 2, 5, 8, 11, 14 | 07 31 100 0021 |
| | 8 | 1.25 | 2, 5, 8, 11 | 07 31 100 0020 |
| | 6 | 1 | 2, 5, 8 | 07 31 100 0019 |
| | 4 | 1 | 2, 8 | 07 31 900 0022 |
| | 2 | 1 | 2 | 07 31 900 0021 |

### Dimensions

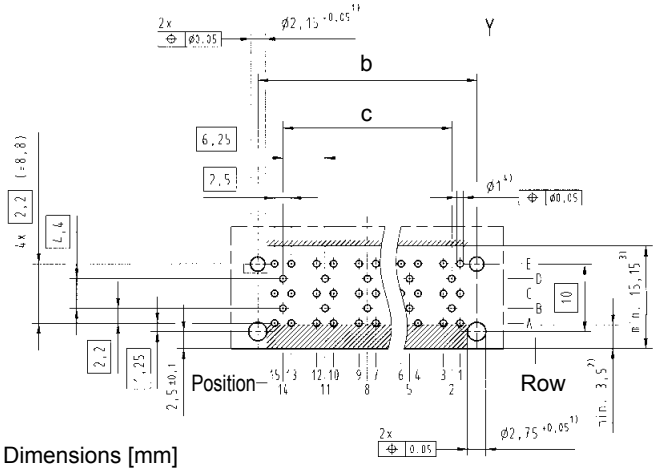



(View magnified)

### Board drillings




Dimensions [mm]

| Angled module | Dimension [mm] a | b | c |
|---|---|---|---|
| 1.50 SU | 35.45 | 32.5 | 25 |
| 1.25 SU | 29.15 | 26.25 | 18.75 |
| 1.00 SU | 22.9 | 20 | 12.5 |

Row B, D: position 2, 5, 8, 11, 14 for signal line

Row A, C, E: position 1, 3, 4, 6, 7, 9, 10, 12, 13, 15 for ground-line

1) Non-metallised drillings

2) No tracks, except solder eyes

3) Limit area of components (valid for both pcb-sides)

4) Details see page 10.07

5) Press-in zone in any angular position related to it's longitudinal axis possible





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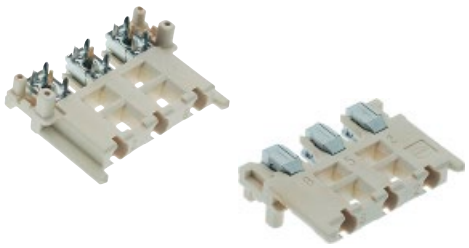
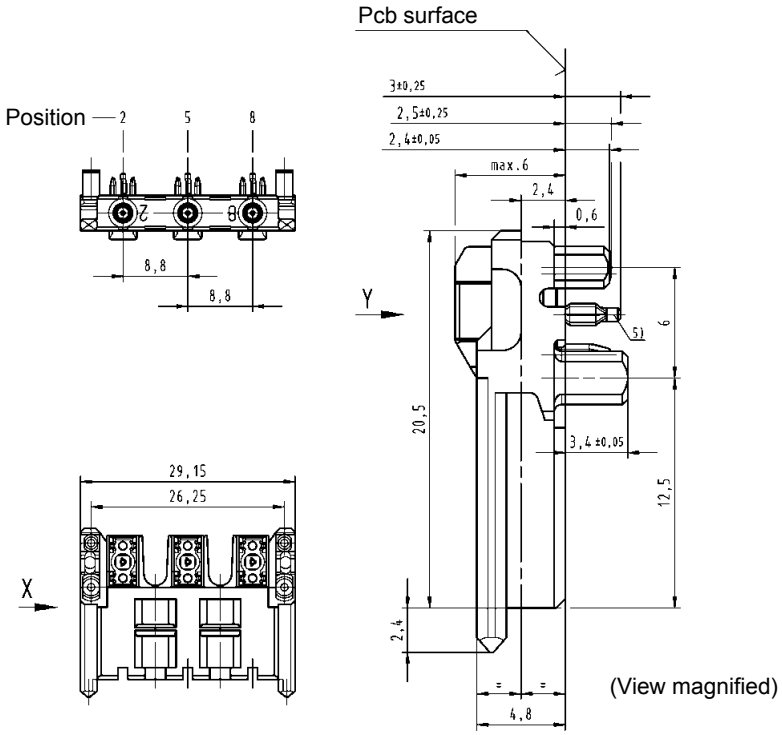


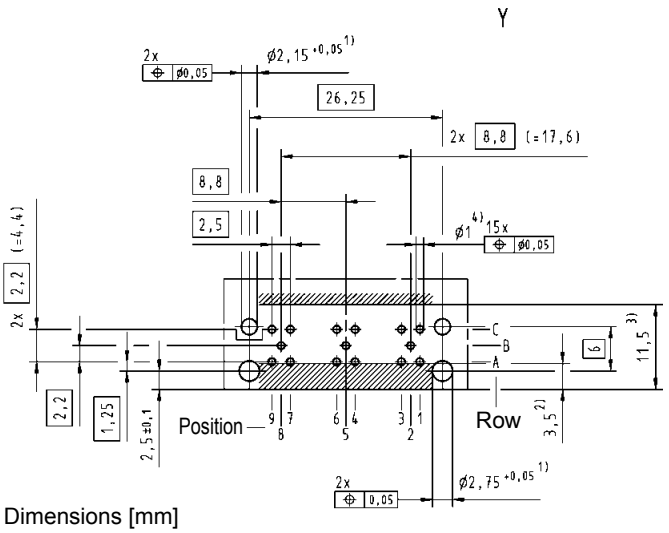
## Angled modules

| Identification | Number of contacts | SU | loaded positions | Part number |
|---|---|---|---|---|
| Mini Coax single-row module, press-in termination | 3 | 1 | 2, 5, 8 | 07 31 100 0028 |

### Dimensions




### Board drillings




Dimensions [mm]

Row B: position 2, 5, 8 for signal line

Row A, C: position 1, 3, 4, 6, 7, 9 for ground-line

1) Non-metallised drillings

2) No tracks, except solder eyes

3) Limit area of components (valid for both pcb-sides)

4) Details see page 10.07

5) Press-in zone in any angular position related to it's longitudinal axis possible





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The Mini Coax product range also includes various cable assemblies and accessories, which provide customers with flexible application options.

The Mini Coax cable connector is available as plug and socket and is crimped to a coaxial cable that can be individually assembled with RF-cable connectors (SMA, SMB, N-type …). While delivering high RF transmission performance, the moulded Mini Coax cable assemblies provide robust connections. The various angle mould types meet different cable routing requirements according to the available space. Thanks to various accessories, such as backplane frame, Han® housing insert and press-in cable housing …, customized connecting requirements can be met.

Remark:
The cable assemblies and accessories shown are part of the overall product range.
**Additional, customized parts are available on request.**

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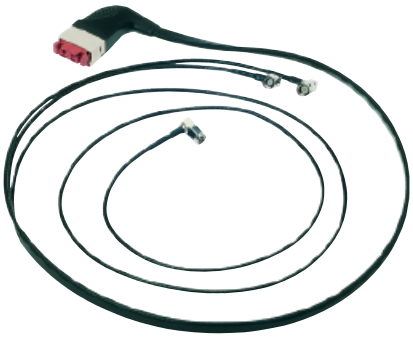
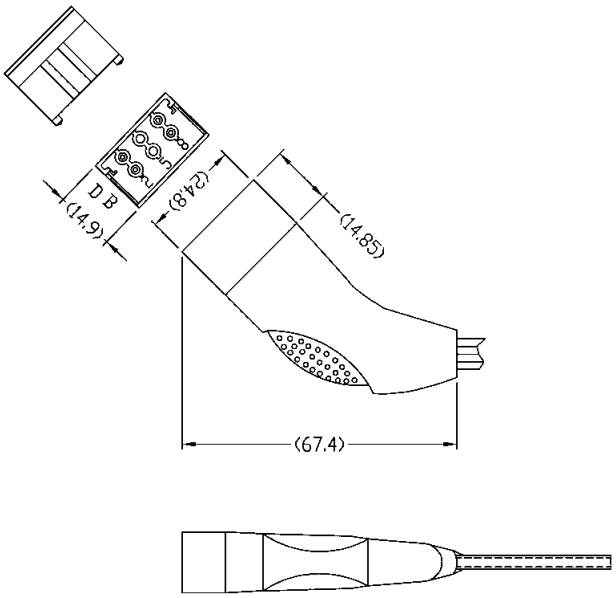


## Cable assemblies

| Identification | Number of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Cable assembly for mating with the angled standard module | 1–10 | on request |  | |





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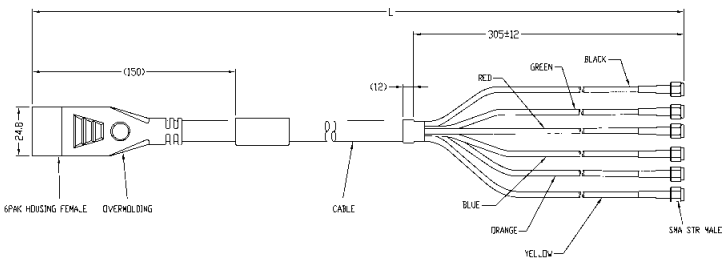
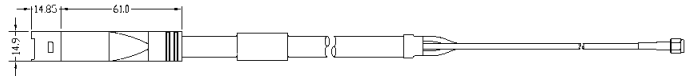
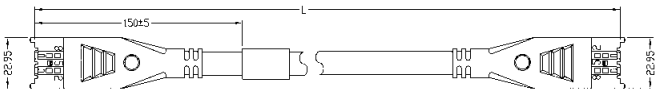
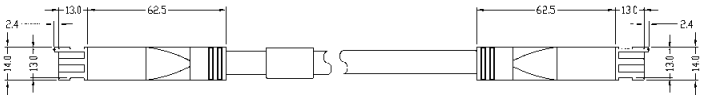
## Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Cable assembly Mini Coax, 6 position female connector (straight) to SMA crimp connector<br>Hood: overmoulded with top entry<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m<br>L = 1.5 m<br>L = 2.0 m | 33 07 233 0500 109<br>33 07 233 1500 110<br>33 07 233 2000 111 |  | |
| Cable assembly Mini Coax, 6 pole, male<br>Cable: Mini Coax cable<br>Hood: overmoulded with top entry<br>Wiring: 1:1 | |  | |
| Length: L = 0.5 m<br>L = 1.5 m<br>L = 2.0 m | 33 07 223 0500 112<br>33 07 223 1500 113<br>33 07 223 2000 114 |  | |





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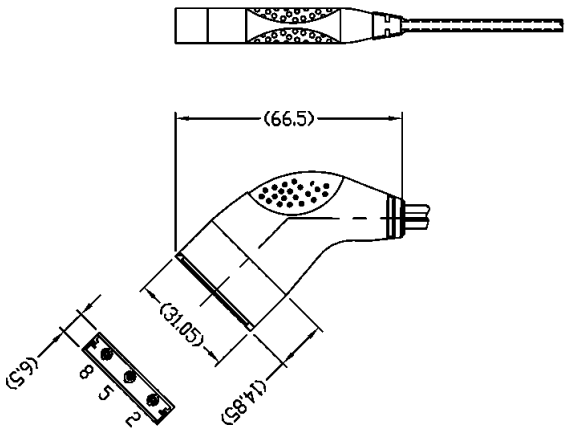
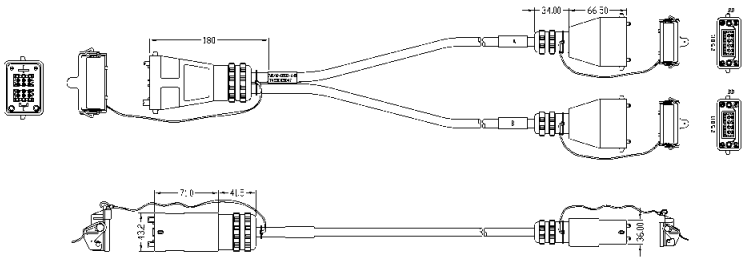
## Assemblies with single-row modules and hoods/housings

| Identification | Number of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Cable assembly for mating with the angled single-row module | 1–3 | on request |  | |
| Cable assembly with heavy duty hoods/housings | 1–10 | on request |  | |



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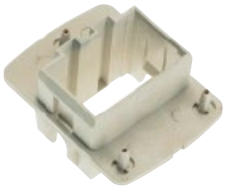
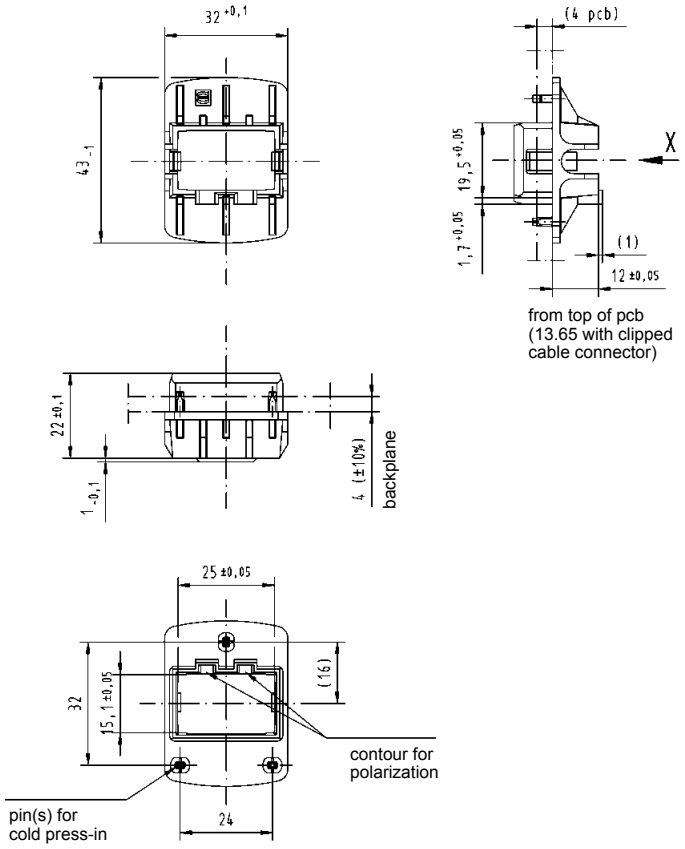


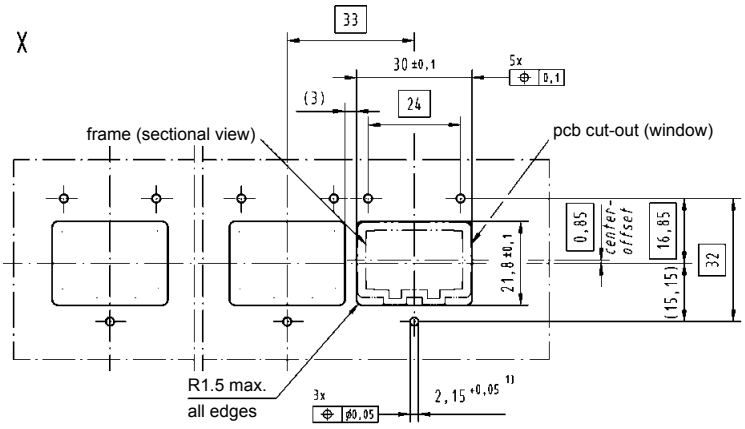
## Accessories

| Identification | Part number |
|---|---|
| Backplane frame | 07 71 100 0042 |

## Dimensions [mm]




## Board drillings




1) Non-metallized drillings



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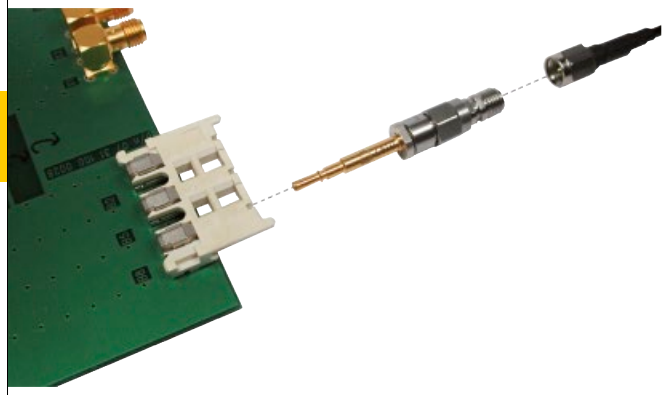
## Accessories

| Identification | Part number |
|---|---|
| Test adapter<br>SMA – Mini Coax | |
| male for straight modules | 07 73 000 0394 |
| female for angled modules | 07 73 000 0393 |

### General information

The Mini Coax-to-SMA Adapter can be directly connected to measurement instrument cables. This allows the precise RF transmission characterization of module cards, backplanes and cable assemblies.



Features:
- SMA connector directly attached to the Mini Coax
- Impedance deviations between adapters < 1.5 Ω
- Good reproducibility of test results
- Test results between different labs are comparable
- Precise measurements of Mini Coax connector system

### Electrical characteristics

| Mini Coax test adapter | Impedance values @ 31.5 ps rise time at reference plane (10% - 90%): | | Max. impedance deviation [Ω] |
|---|---|---|---|
| | Max. [Ω] | Min. [Ω] | |
| SMA to male | 52.5 | 47.5 | 1.5 |
| SMA to female | 53.5 | 48.0<br>40.5* | 1.0 |

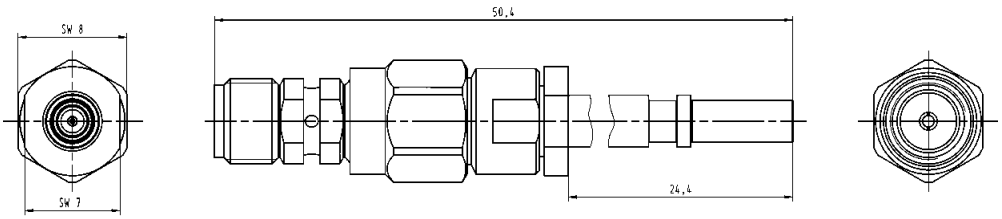
| Connector | Electrical length [ps] |
|---|---|
| Mated SMA<br>to male / female adapter | 262.2 |

| Frequency [GHz] | Return loss [dB] mated adapter pairs | Insertion loss [dB] mated adapter pairs |
|---|---|---|
| < 1 | - 26.9 | - 0.17 |
| < 2 | - 22.5 | - 0.24 |
| < 3 | - 19.9 | - 0.26 |
| < 4 | - 16.4 | - 0.34 |
| < 5 | - 14.4 | - 0.42 |

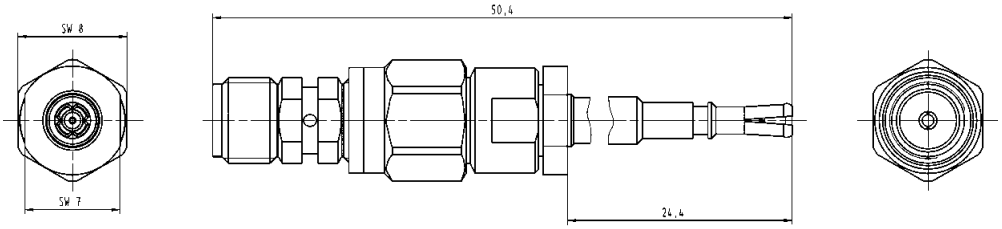
*: Impedance drop is due to the female Mini Coax connector design.

Dimensions [mm]

Male test adapter




Female test adapter



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# Notes





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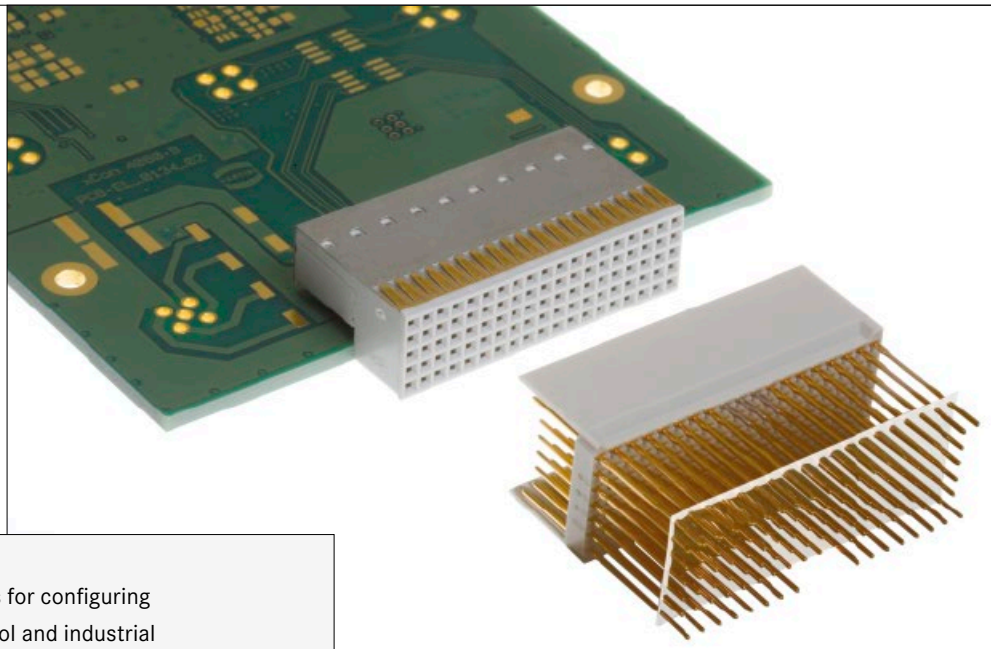
# 11. *har-bus® HM* Connectors



*har-bus® HM* connectors are the basis for configuring high-performing backplanes for control and industrial computer systems in 19” technology. These connectors are standardized for the CompactPCI and the VME64x bus.
All connectors are designed for press-in technology, the female connectors are also available as a solder version.

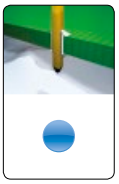
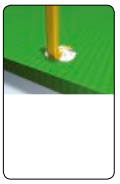
*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| ● | | ● | | ● | ● | ● | ● | ● | ● | ● |

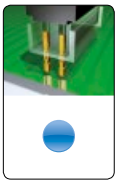
**Cable termination**

| Han-Quick Lock® | IDC | Crimp |
|---|---|---|
| | | |
| **Screw** | **Cage clamp** | **Axial screw** |
| | | |

**PCB termination**

| THT | SMC | SMT |
|---|---|---|
|  | |  |
| ● | | |

**Press-in**



●

**Application standard**

VMEbus Technology · CompactPCI

**Housing integration**

| Separate housing | Integrated housing |
|---|---|
| | |

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Any possible contact configuration can be requested with the customer request forms (see pages 11.48 ff). Alternatively please contact your local HARTING representative.





**har-bus® HM** tooling see chapter 20

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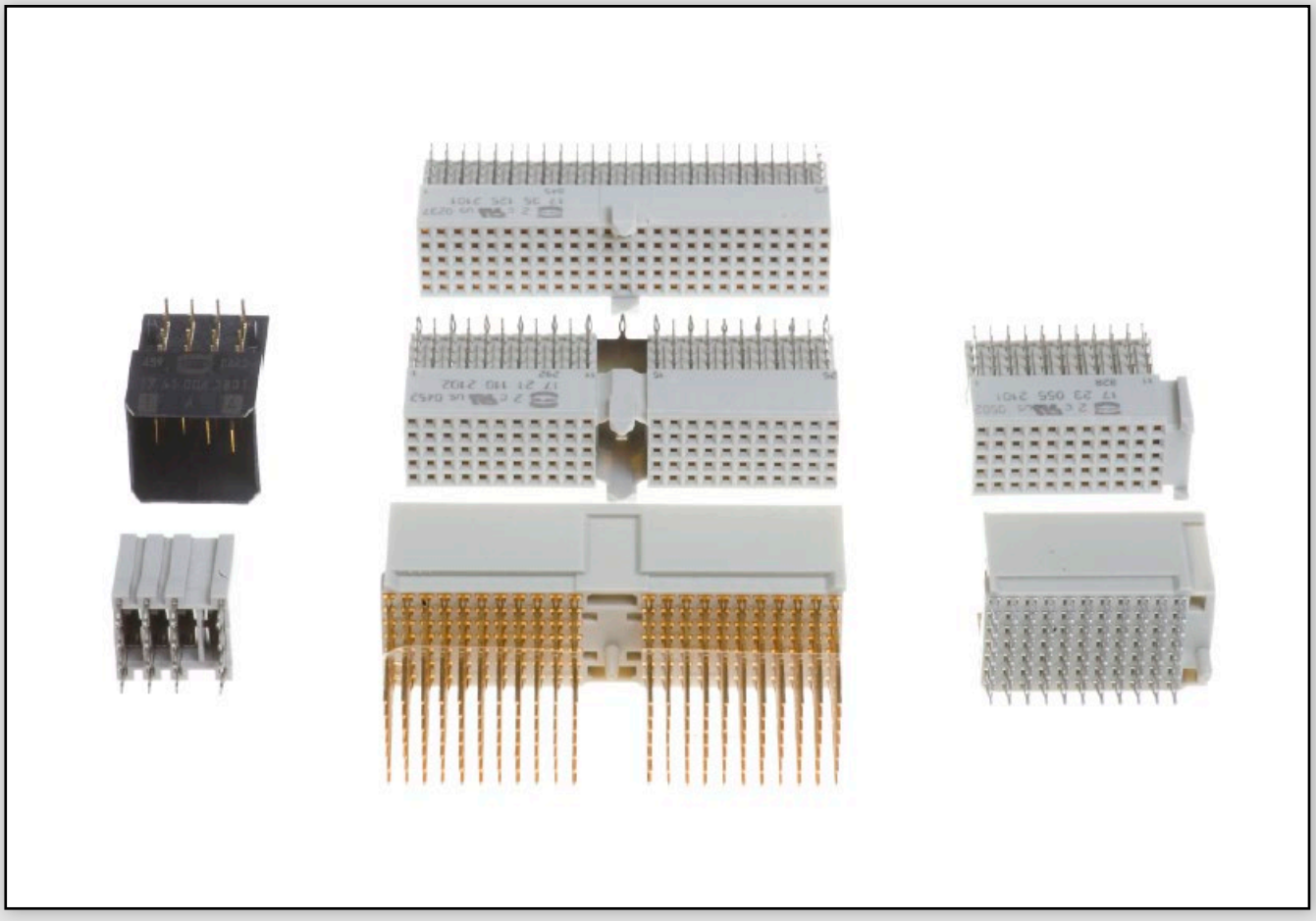
## HARD METRIC CONNECTORS *har-bus® HM* IN 2.00 mm PITCH

*har-bus® HM* connectors are the basis for configuring high-performing backplanes for control and industrial computer systems in 19” technology.
HARTING offers 5 row and 8 row 2 mm hard metric connectors *har-bus® HM* according to IEC 61 076-4-101. The product family includes all standard types such as all variants for CompactPCI, inclusive Hot Swap and CTI (Computer Telephony Integration). The modules are defined as the 5+2 row types A, B, AB and C and the 8+2 row types D, E and DE. All male and female connectors are available with press-in terminations.

The high current *har-bus® HM* Power connector complies with the OBSAI specification V1.1. This very compact connector can be loaded with up to four contacts, each contact carrying up to 23 A at 70 °C (in OBSAI configuration). The connector is offered in four lengths to allow hot swapping. The right-angled male connectors are available for press-in and for PiHIR soldering.
Accessories and press-in tooling are available for all connectors.







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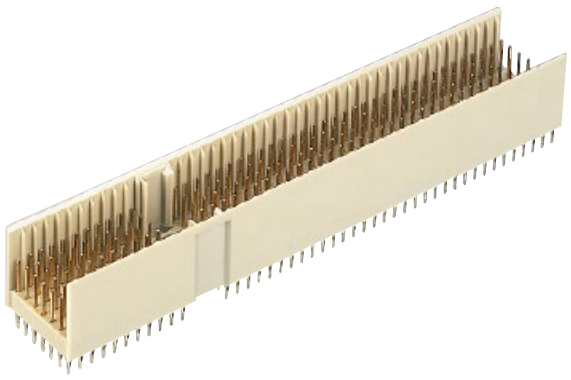
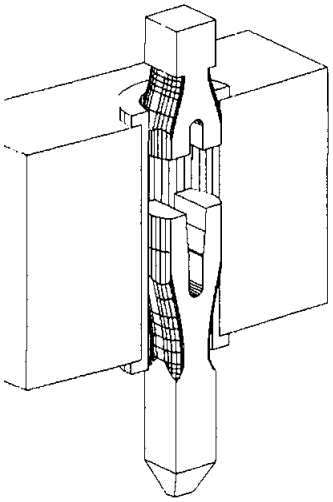
**COMBINED STYLE FOR CompactPCI:**
Additional to the standard insulator types according to the specification there is a Monoblock available, especially for CompactPCI applications. It unites the type A and the type $B_{22}$ in one connector. With the Monoblock, only one connector is necessary for a standard configuration of a 3U module card which offers a cost advantage in the production process and logistics.



**"NEEDLE-EYE" PRESS-IN TECHNOLOGY:**
The *har-bus® HM* press-in zone is based on the industry renowned needle-eye technology. Its special design allows for compensation of tolerances of pcb surface properties (e.g. superfluous tin plating). The excessive material is displaced within the plated through hole, whereby a gas-tight and corrosion resistant electrical connection is assured.



**INTERNATIONAL STANDARD:**
The *har-bus® HM* connectors are designed to meet the PICMG 2.x specification and can be used in CompactPCI. CompactPCI is a common standard e.g. for industrial computers.

PICMG®

CompactPCI®





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| | | |
|---|---|---|
| Design according | : | IEC 61076-4-101 |
| Approvals | | |
| Underwriters Laboratories Inc.® | : | c UL us with their respective ratings documented in file E 102079 |
| Number of contacts | : | 55 – 220 signal (77 – 308 fully shielded); or customised |
| Contact spacing | : | 2.00 mm |
| Working current | : | 1 A @ 70 °C (80 % derating) |
| Test voltage $U_{r.m.s.}$ | : | AC 750 V min. |
| Contact resistance | : | 20 mΩ max. |
| Insulation resistance | : | 10 GΩ min. |
| Temperature range | : | -55 °C … +125 °C |
| Durability as per IEC 61076-4-101 | : | Performance level 2 = *250 mating cycles* in total.<br>*First 125 mating cycles*, then 4 days gas test using 0.5 ppm $SO_2$ and 0.1 ppm $H_2S$ (at 25 ± 2 °C and 75 ± 3 % humidity). Measurement of contact resistance.<br>The *remaining 125 mating cycles* are subject to measurement of contact resistance and visual inspection. No abrasion of the contact finish through to the base material. No functional impairment.<br>Performance level 1 = *500 mating cycles* in total.<br>*First 250 mating cycles*, then 10 days gas test using 0.5 ppm $SO_2$ and 0.1 ppm $H_2S$ (at 25 ± 2 °C and 75 ± 3 % humidity). Measurement of contact resistance.<br>The *remaining 250 mating cycles* are subject to measurement of contact resistance and visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. |
| Termination technique | : | **compliant press-in** |
| Mating force | : | 0.75 N/pin max. |
| Withdrawal force | : | 0.15 N/pin min. |
| Materials | | |
| Mouldings | : | Thermoplastic resin, glass-fibre filled, UL 94-V0 |
| Contacts | : | Copper alloy |
| Contact surface | | |
| Contact zone male | : | Au/PdNi/Ni, contacts are treated with Bellcore recommended lubricant (PPE) |
| Contact zone female | : | Au/Ni, contacts are treated with Bellore recommended lubricant (PPE) |
| Press-in zone | : | Ni |
| Packaging | : | Tube |



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Due to the high deformation capability and resilience of har:bus® HM press-in contacts, they can be easily and repeatedly removed in case of repairs without impairment to their functioning.

har:bus® HM press-in contacts are extremely versatile and offer a reliable electrical contact, therefore they are especially well suited for applications with these surfaces.

Please contact us for detailed test reports.

### Benefits of press-in technology

- Thermal shocks associated with the soldering process and the risk of the board malfunction are avoided.
- No need for the subsequent cleaning of the assembled pcb's
- Unlimited and efficient processing of partially gold-plated pins for rear I/O - manual soldering is no longer necessary!

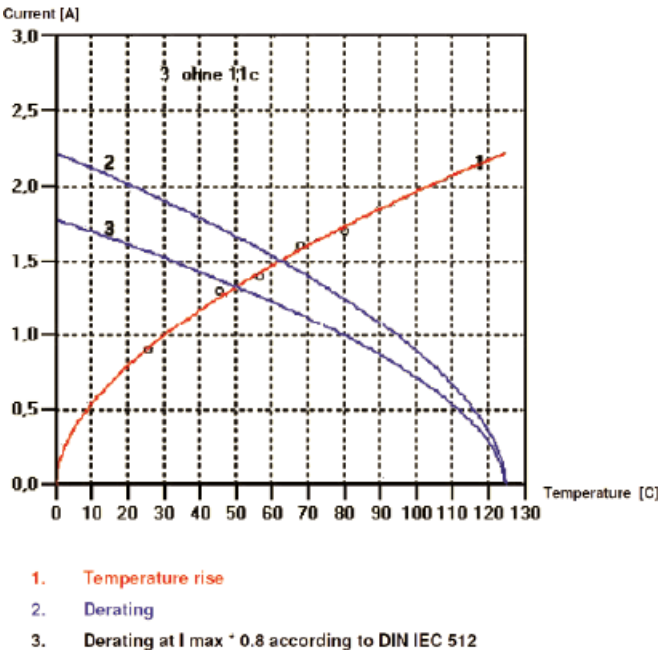
### Recommended configuration of plated through holes

The press-in zone of the har:bus® HM connectors is approved to be used with a plated through hole according EN 60 352-5 with a diameter of $0.60^{\pm 0.05}$ mm (drilled hole $0.7^{\pm 0.02}$ mm).

Based on our experiences regarding the production process of the PCB manufacturer, we recommend a plated through hole configuration like shown in the below spreadsheet. To achieve the recommended plated through hole diameter, it is important to specify especially the drilled hole diameter of $0.7^{\pm 0.02}$ mm to your PCB supplier.

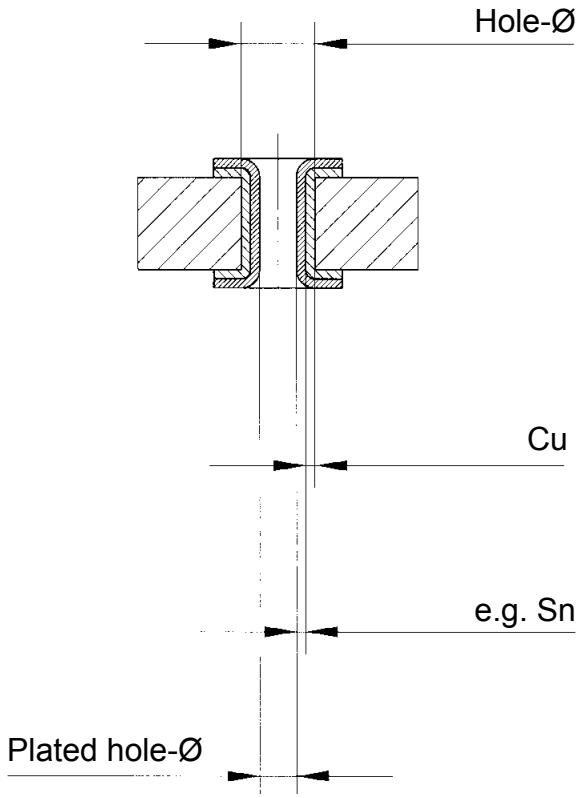
| | | |
|---|---|---|
| *Tin plated PCB (HAL)* | Hole-Ø | $0.7^{\pm 0.02}$ mm |
| | Cu | min. 25 µm |
| | Sn | max. 15 µm |
| | Plated hole-Ø | 0.60-0.65 mm |
| *Chemical tin plated PCB* | Hole-Ø | $0.7^{\pm 0.02}$ mm |
| | Cu | min. 25 µm |
| | Sn | min. 0.8 µm |
| | Plated hole-Ø | 0.60-0.65 mm |
| *Au / Ni plated PCB* | Hole-Ø | $0.7^{\pm 0.02}$ mm |
| | Cu | min. 25 µm |
| | Ni | 3-7 µm |
| | Au | 0.05-0.12 µm |
| | Plated hole-Ø | 0.60-0.65 mm |
| *Silver plated PCB* | Hole-Ø | $0.7^{\pm 0.02}$ mm |
| | Cu | min. 25 µm |
| | Ag | 0.1-0.3 µm |
| | Plated hole-Ø | 0.60-0.65 mm |
| *OSP copper plated PCB* | Hole-Ø | $0.7^{\pm 0.02}$ mm |
| | Cu | min. 25 µm |
| | Plated hole-Ø | 0.60-0.65 mm |

PCB board thickness: ≥ 1.4 mm




1. Temperature rise
2. Derating
3. Derating at I max * 0.8 according to DIN IEC 512

Derating curve




Recommended configuration of plated through holes, valid for har:bus® HM





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HARTING offers 13 contact lengths for har:bus® HM male connectors: the standard mating length of 8.2 mm, pre-leading contacts with 9.7 mm and extra long contacts preferred for shielding with 11.2 mm mating length.

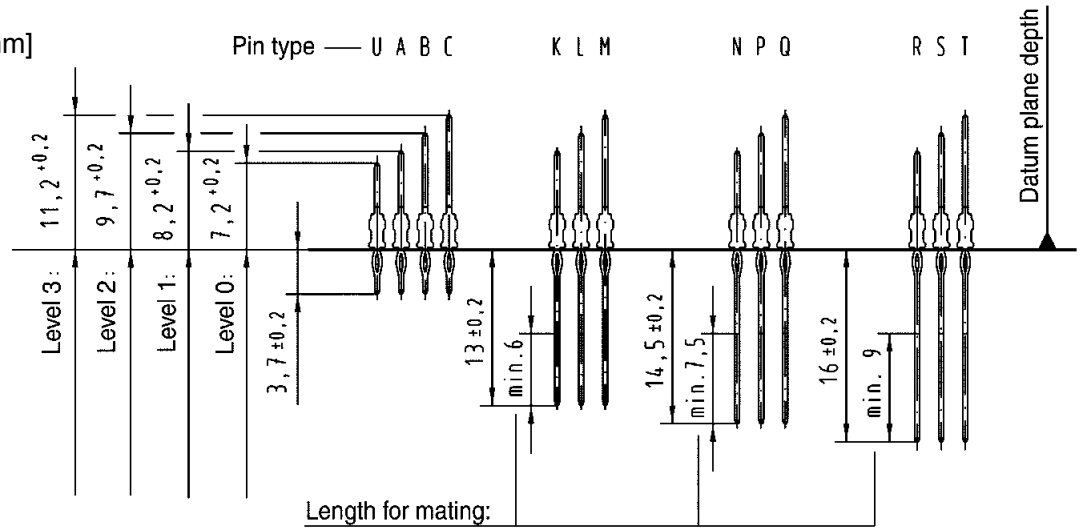
On the termination side the standard length is 3.7 mm. With the three termination lengths of 13.0, 14.5 and 16.0 mm even for rear I/O applications different mating levels are possible, depending on the pcb thickness and shroud height.

For the standard termination length, an extra short contact for special applications with a mating length of 7.2 mm is available.

The different contact lengths are designated with letters to identify them in the configurations. For special loadings please use the customer request form at the end of this chapter.

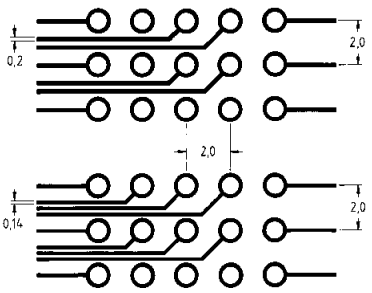
All contacts are offered with press-in termination 'eye of the needle'. In accordance with the application they can be delivered in performance level 1 or 2.

Contact dimensions [mm]



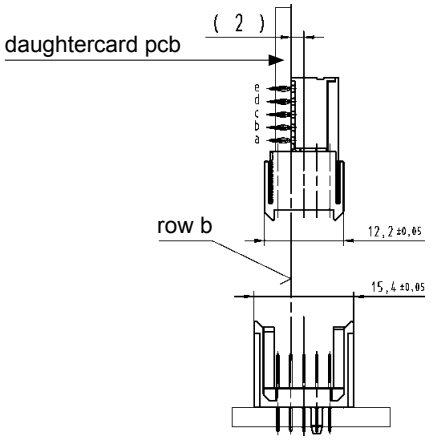

## Circuit density

When using the specified diameter of the finished through hole according to IEC 61 076-4-101 (0.6 ± 0.05 mm) with an appropriate annular ring, the remaining distance between the rings is about 1 mm. Under the condition that the width of the track and the space between should be equal, two tracks of 0.2 mm width or three tracks of 0.14 mm width can be placed between two rings. Typical designs are shown in the drawing on the right side.




## Alignment of male and female connector

For the alignment of male and female connector, a common reference plane is defined. This reference plane is the top side of the daughtercard pcb and the contact rows "b" of the female and the male connector (see drawing).



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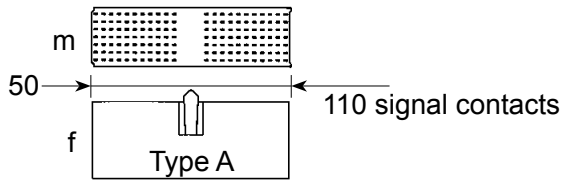


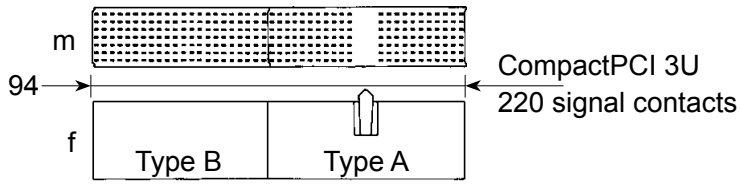


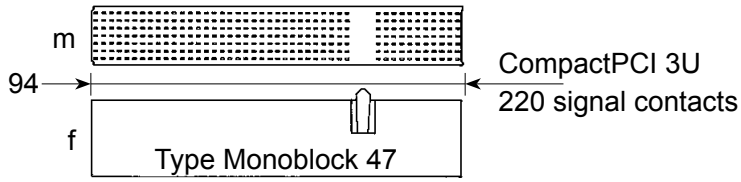


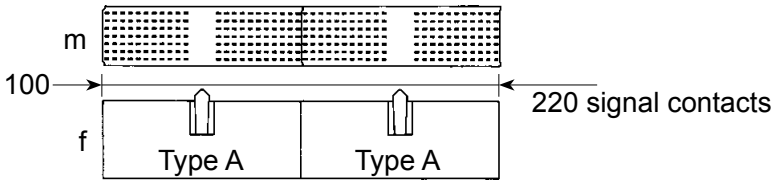


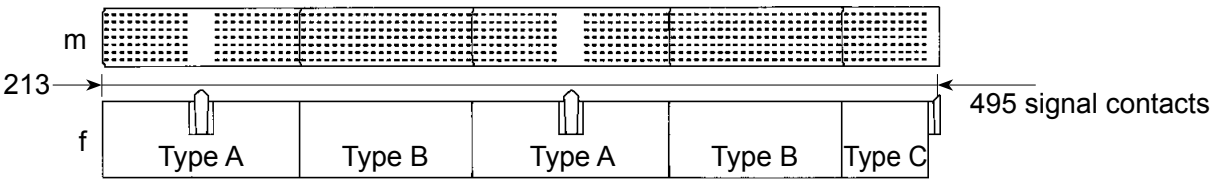


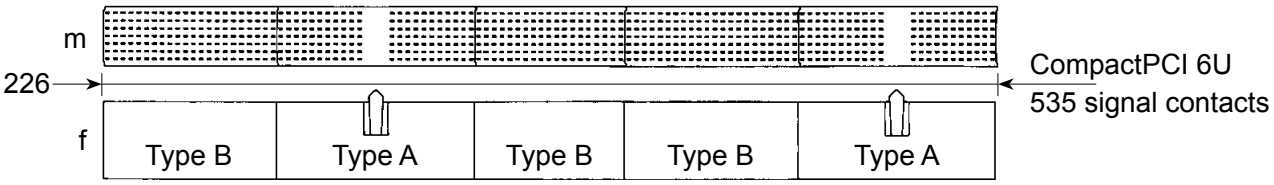


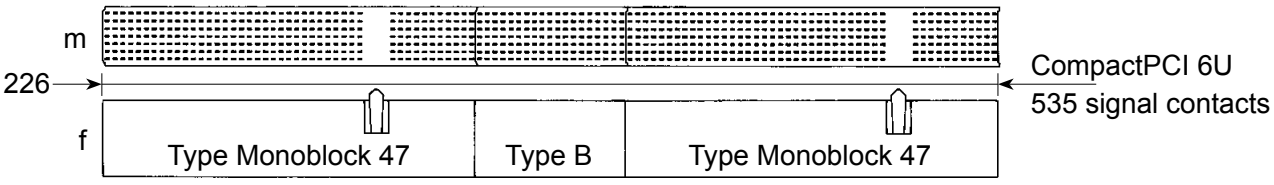


All HARTING har:bus® HM connectors can be assembled end to end in any configuration.

General rules:

- Type B connectors should always be used in combination with an A type and/or C type connectors that are fitted with alignment features.
- Type C connectors must be assembled at the end of a connector stack, to achieve polarisation and avoid mismating.
- To ensure the correct slot position of connector stacks coding can be added with type A connectors.
- Starting with an type A module (50 mm) any module can be added within the above recommendation (see typical examples shown in the diagram).

m = male connector
f = female connector

Dimensions [mm]



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**Improved guiding with AB-modules:**

In accordance with the equipment practice each front side arrangement of har:bus® HM connectors shall have at least one A-module per slot to ensure that the connector can accommodate ± 2 mm alignment tolerances in rack systems.

On some rear I/O arrangements the A-module's alignment capability cannot be utilised, because only B-modules are used for feed through. Consequently AB-modules were introduced to ensure guiding capabilities where formerly only B-modules were used. Those AB-modules represent a combination of A- and B-modules and are specified in **CompactPCI by PICMG 2.0 Rev. 3.0** for certain rear I/O applications.

The AB-modules have guiding pegs similar (but not mating compatible to prevent mismating) to those of the A-module providing the same proven mating tolerances of ± 2 mm. The AB-modules have no coding center but are fully equiped with contacts in order to maintain the full density as per the B-modules.

The **AB-female** connector mates either with an **AB-shroud** or with **AB-male** connectors. The centered pin positions of the shielding rows of male connectors are simply equipped with short spill contacts (if standard connector and shroud are used). This prevents that the guiding peg of the female AB-module stubbing on the feed through contacts of the front side's fixed connector. These fixed connector loadings are called **AB-friendly**.

The AB-male connector will not be equiped with shielded contacts in the centre where the guiding peg will engage.

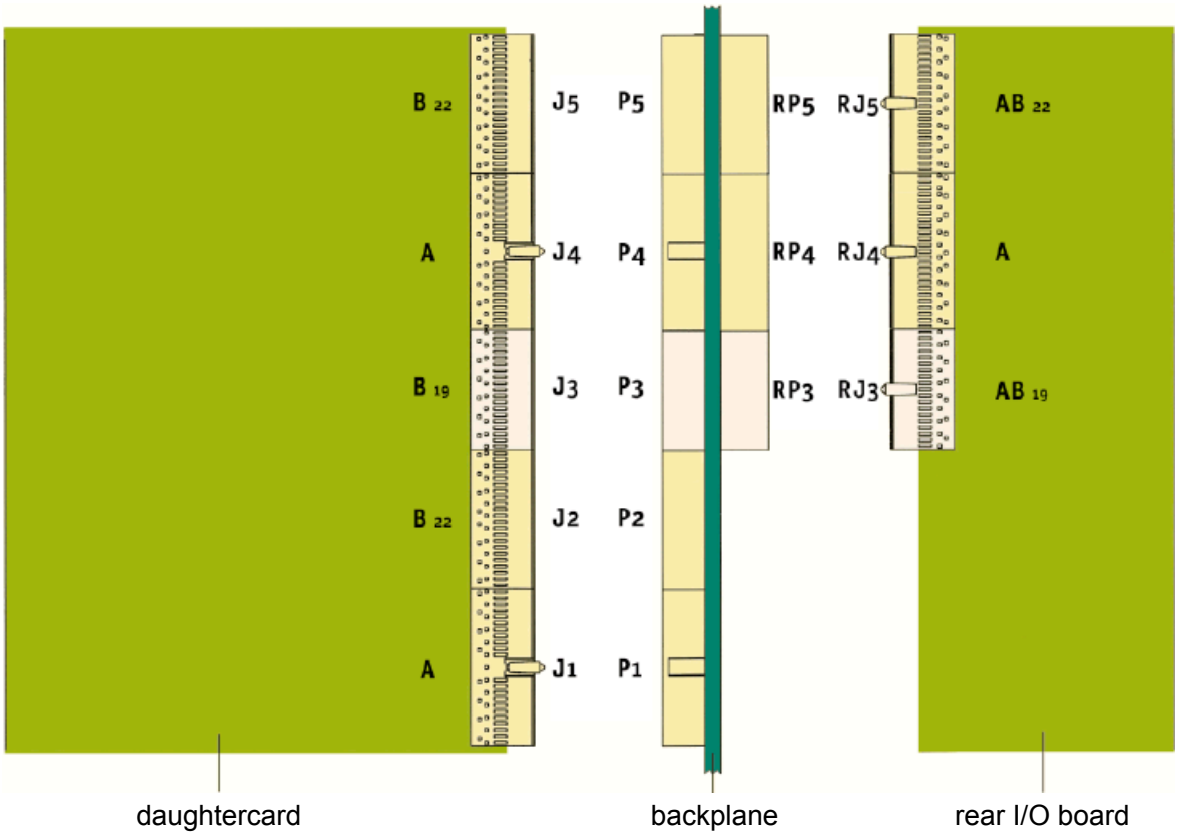


Fig. 3: CompactPCI 6U configuration



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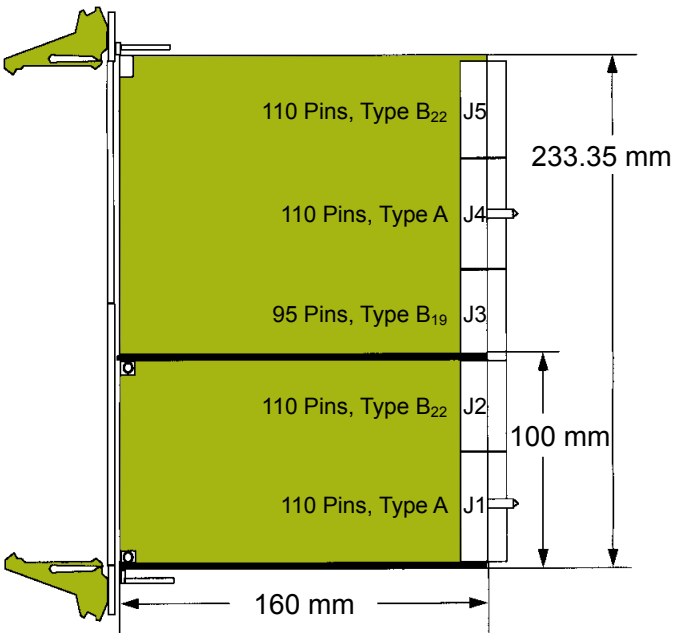
*CompactPCI*® as a standard is maintained and enhanced by the PCI Industrial Computer Manufacturers Group (PICMG®). It defines a combination of the electrical and logical specifications of the PCI standard and the mechanical specifications of the IEEE 1101 and IEC 60297 series of standards. The board connector has been developed from the IEC 61076-4-101 series of 2.0 mm connectors. The mounting location and dimensions for the 2.0 mm connectors are specified in IEEE 1101.11. Some additional mechanical definitions for 2.0 mm connectors in the Eurocard format are being specified in the VITA 30 draft.

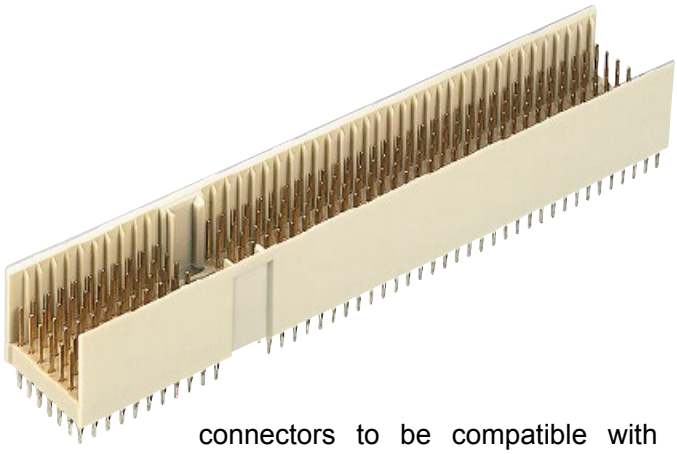
Other international standards are listed in the *CompactPCI*® standard for environmental and




related specifications. This gives *CompactPCI*® a solid foundation of international standards and practices for mechanical robustness.

The board format is either a 3U or a 6U Eurocard as defined in IEC 60297. There are two or five connectors specified for 3U or 6U boards respectively. Connectors are numbered from J1/P1 through J5/P5 (bottom to top) on the board or backplane.

Slave or peripheral boards need J1/P1 as a minimum, master or system boards need both J1/P1 and J2/P2 as a minimum. Backplanes should always have the full complement of



connectors to be compatible with any type of board. As opposed to the CPCI standard (pins numbered from bottom to top), the contact numbers on the connector are numbered from top to bottom (according to the IEC standard).

The front panel of CPCI cards may be equipped with additional keying pegs to code individual board types. There is also an extended pin length to remove any electro static charge before contacts on the rear connnectors mate.

This pin also functions as a mechanical guide to position the board as straight as possible for insertion. This prevents pin bending and lowers the insertion force.

Some applications could require up to 500 pins to be pushed into sockets simultaneously.

Connectors for high availability applications (hot swap) come with 3 different lengths of pins for a staged sequence of mate or break of contact.

Connector J1/P1 carries the signals for a 32 bit PCI bus (see table of contact assignments for J1/P1). Connector J2/P2 on a system card has the additional signals for a 64 bit PCI bus and some user-defined I/O (see table of contact assignments for J2/P2). On slave cards all of J2/P2 might be user-defined I/O except the top row which carries the signals for geographical addressing. J3/P3 should be reserved for other system bus definitions. J4/P4 and J5/P5 are used for I/O or secondary buses, e.g. H.110 in telecom applications or for bridges into other buses like VMEbus.

This is used to accommodate two bus platforms in one card cage on one backplane.





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Contact assignment on *CompactPCI*® system position (J1/P1)

| | a | b | c | d | e | |
|---|---|---|---|---|---|---|
| 25 | +5 V | REQ64# | ENUM# | +3,3 V | +5 V | 25 |
| 24 | AD[1] | +5 V | V(I/O) | AD[0] | ACK64# | 24 |
| 23 | +3,3 V | AD[4] | AD[3] | +5 V | AD[2] | 23 |
| 22 | AD[7] | GND | +3,3 V | AD[6] | AD[5] | 22 |
| 21 | +3,3 V | AD[9] | AD[8] | M66EN | C/BE[0]# | 21 |
| 20 | AD[12] | GND | V(I/O) | AD[11] | AD[10] | 20 |
| 19 | +3,3 V | AD[15] | AD[14] | GND | AD[13] | 19 |
| 18 | SERR# | GND | +3,3 V | PAR | C/BE[1]# | 18 |
| 17 | +3,3 V | SDONE | SBO# | GND | PERR# | 17 |
| 16 | DEVSEL# | GND | V(I/O) | STOP# | LOCK# | 16 |
| 15 | +3,3 V | FRAME# | IRDY# | GND | TRDY# | 15 |
| 14 | | | | | | 14 |
| 13 | | | Key Area | | | 13 |
| 12 | | | | | | 12 |
| 11 | AD[18] | AD[17] | AD[16] | GND | C/BE[2]# | 11 |
| 10 | AD[21] | GND | +3,3 V | AD[20] | AD[19] | 10 |
| 9 | C/BE[3]# | IDSEL | AD[23] | GND | AD[22] | 9 |
| 8 | AD[26] | GND | V(I/O) | AD[25] | AD[24] | 8 |
| 7 | AD[30] | AD[29] | AD[28] | GND | AD[27] | 7 |
| 6 | REQ# | GND | +3,3 V | CLK | AD[31] | 6 |
| 5 | Bus Reserved | Bus Reserved | RST# | GND | GNT# | 5 |
| 4 | Bus Reserved | GND | V(I/O) | INTP | INTS | 4 |
| 3 | INTA# | INTB# | INTC# | +5 V | INTD# | 3 |
| 2 | TCK | +5 V | TMS | TDO | TDI | 2 |
| 1 | +5 V | -12 V | TRST# | +12 V | +5 V | 1 |
| | a | b | c | d | e | |

Contact assignment on *CompactPCI*® system position (J2/P2)

| | a | b | c | d | e | |
|---|---|---|---|---|---|---|
| 22 | GA4 | GA3 | GA2 | GA1 | GA0 | 22 |
| 21 | CLK6 | GND | Reserved | Reserved | Reserved | 21 |
| 20 | CLK5 | GND | Reserved | GND | Reserved | 20 |
| 19 | GND | GND | Reserved | Reserved | Reserved | 19 |
| 18 | Bus Reserved | Bus Reserved | Bus Reserved | GND | Bus Reserved | 18 |
| 17 | Bus Reserved | GND | PRST# | REQ6# | GNT6# | 17 |
| 16 | Bus Reserved | Bus Reserved | DEG# | GND | Bus Reserved | 16 |
| 15 | Bus Reserved | GND | FAL# | REQ5# | GNT5# | 15 |
| 14 | AD[35] | AD[34] | AD[33] | GND | AD[32] | 14 |
| 13 | AD[38] | GND | V(I/O) | AD[37] | AD[36] | 13 |
| 12 | AD[42] | AD[41] | AD[40] | GND | AD[39] | 12 |
| 11 | AD[45] | GND | V(I/O) | AD[44] | AD[43] | 11 |
| 10 | AD[49] | AD[48] | AD[47] | GND | AD[46] | 10 |
| 9 | AD[52] | GND | V(I/O) | AD[51] | AD[50] | 9 |
| 8 | AD[56] | AD[55] | AD[54] | GND | AD[53] | 8 |
| 7 | AD[59] | GND | V(I/O) | AD[58] | AD[57] | 7 |
| 6 | AD[63] | AD[62] | AD[61] | GND | AD[60] | 6 |
| 5 | C/BE[5]# | GND | V(I/O) | C/BE[4]# | PAR64 | 5 |
| 4 | V(I/O) | Bus Reserved | C/BE[7]# | GND | C/BE[6]# | 4 |
| 3 | CLK4 | GND | GNT3# | REQ4# | GNT4# | 3 |
| 2 | CLK2 | CLK3 | SYSEN# | GNT2# | REQ3# | 2 |
| 1 | CLK1 | GND | REQ1# | GNT1# | REQ2# | 1 |
| | a | b | c | d | e | |

In mechanical terms J1/P1 is a 25x5 matrix of contacts. Three rows of 5 contacts (rows 12 - 14) are not used for electrical contacts. Instead, plastic keys of different orientation and configuration are used to key board locations as to system or peripheral slot, voltage options, etc.

J2/P2 is a shortened connector with only 22 rows of contacts instead of 25 rows for a standard size. HARTING now offers monolithic versions with J1/P1 and J2/P2 combined in one single connector.

This combination together with some space left on the card to fit into guide rails makes maximum use of the 100 mm rear edge of the 3U Eurocard.

On a 6U card this connector setup is repeated on J4/P4 and J5/P5.

The J3/P3 connector is a shortened version of the 2.0 mm connector with 19 rows of 5 signal contacts.

The size results from the height of a 6U board (233 mm) which is more than double the height of a 3U board.

All connectors used for *CompactPCI*® are based on a 7 column pitch. The inner 5 columns are used for logic signals and power. The outer columns on either side are reserved for shielding or ground.

PICMG®

Executive Member



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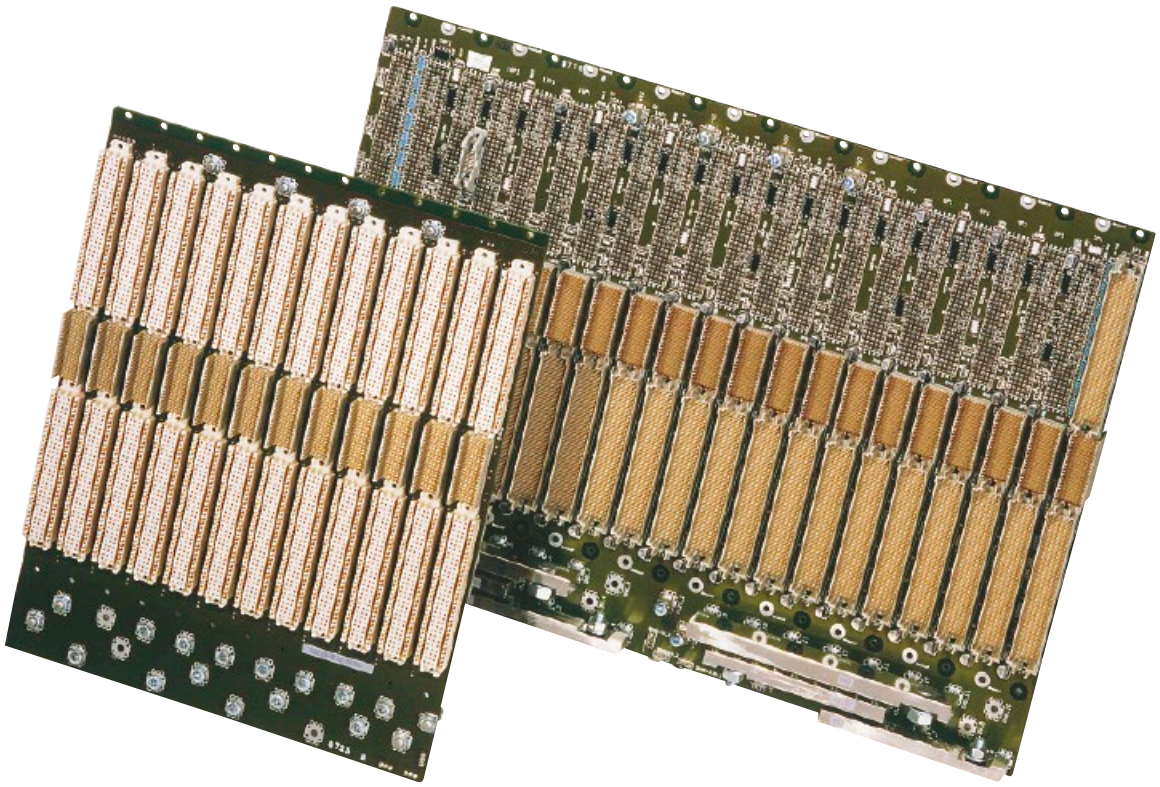
The VMEbus has evolved over a period of more than 25 years to become the leading bus architecture in open industrial applications. The specification is an ANSI norm, the original specification has been extended to become a draft standard VME64x ANSI/VITA 1.1-1997. This draft standard includes the specification for the 5-row DIN compatible connector (IEC 61076-4-113) and for a centre connector J0/P0 on 6U VME cards, which is identical to J3/P3 in *CompactPCI*® systems.

In VMEbus systems it is possible to use custom connectors in the J0/P0 area (e.g. coax connectors). To prevent problems with non-mating backplanes it is strongly recommended to use front panel keying. The IEEE 1101 documents J0/P0 can also be used with rear transition modules for pluggable I/O cabling. As mentioned above, the contacts on this connector may be bussed. One example is the ATM CellBus, which is in the process of being standardised. The bus on J0/P0 connectors might actually be a plug-on mezzanine backplane rather than conducting traces integrated into the backplane itself.



The 2.0 mm J0/P0 connector in VME64x systems is used for additional I/O, for new high speed sub busses or I/O for mezzanine modules, e.g. IP modules on VMEbus boards. The connector is placed on the Eurocard to work in combination with the non-metric original VMEbus connectors DIN 41612 type C or the newer 5-row connector har-bus® 64. The mounting location and dimensions for the J0/P0 VMEbus connector (IEC 61076-4-101) is specified in IEEE 1101.11. The VMEbus 2.0 mm connector uses 5 columns of signal contacts and optional two additional outer columns on either side for shielding. All 95 signal contacts are user defined.





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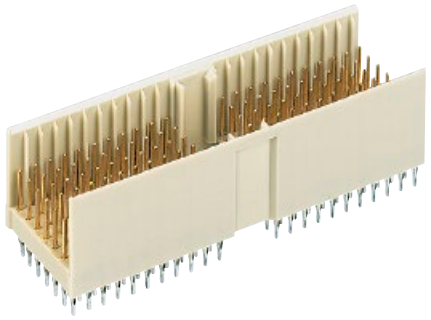
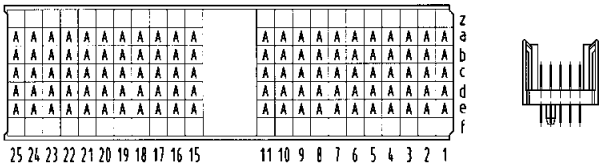
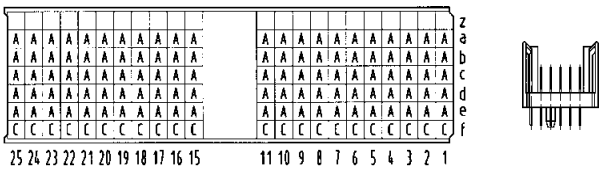
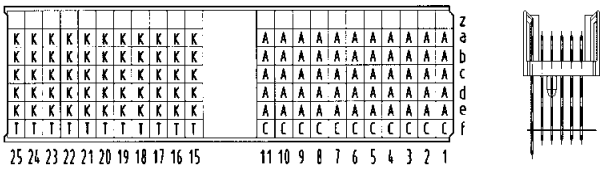
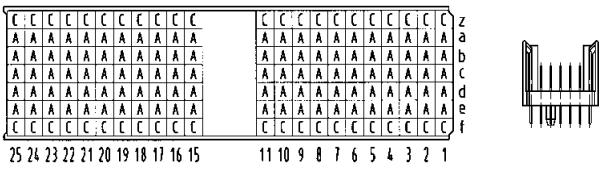
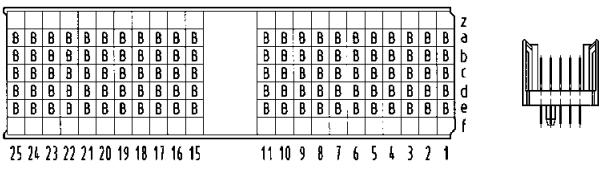
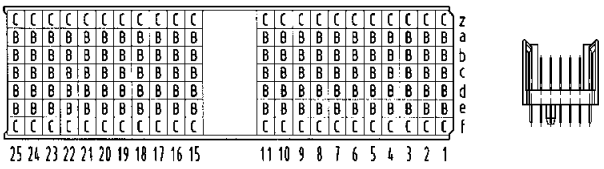


## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type A | 110 | 8.2 | 3.7 | 17 01 110 1201<br>**17 01 110 2201** |  |
| Type A | 132 | 8.2/<br>11.2 | 3.7 | 17 01 132 1203<br>**17 01 132 2203** |  |
| Type A | 132 | 8.2/<br>11.2 | 3.7/<br>13.0/<br>16.0 | 17 01 132 1007<br>**17 01 132 2007** |  |
| Type A | 154 | 8.2/<br>11.2 | 3.7 | 17 01 154 1201<br>**17 01 154 2201** |  |
| Type A | 110 | 9.7 | 3.7 | 17 01 110 1204<br>**17 01 110 2204** |  |
| Type A | 154 | 9.7/<br>11.2 | 3.7 | 17 01 154 1205<br>**17 01 154 2205** |  |

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**
Connector dimensions see page 11.14



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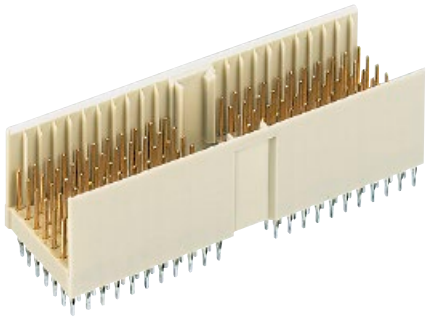
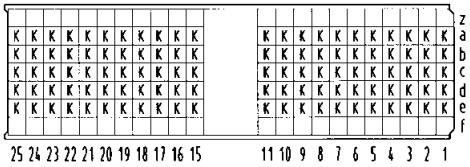
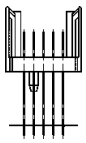
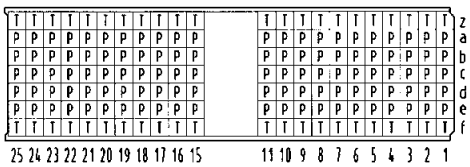
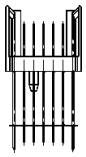
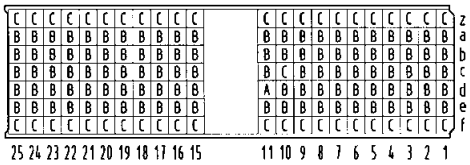
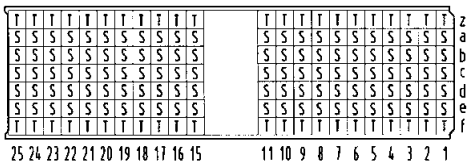
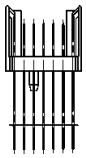
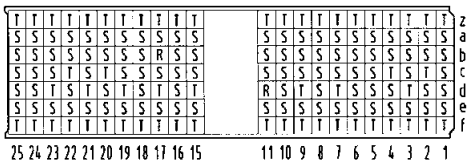
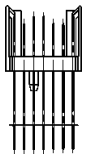
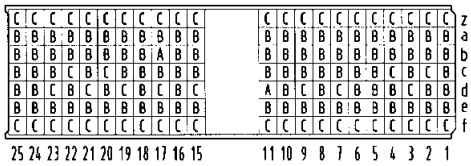
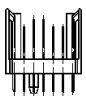


## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type A | 110 | 8.2 | 13.0 | 17 01 110 1402<br>**17 01 110 2402** |   |
| Type A | 154 | 9.7/<br>11.2 | 14.5/<br>16.0 | 17 01 154 1001<br>**17 01 154 2001** |   |
| Type A<br>CompactPCI<br>Position P1 | 154 | 8.2/<br>9.7/<br>11.2 | 3.7 | 17 01 154 1203<br>**17 01 154 2203** |  |
| Type A<br>CompactPCI<br>Position P4 | 154 | 9.7/<br>11.2 | 16.0 | 17 01 154 1604<br>**17 01 154 2604** |   |
| Type A<br>CompactPCI<br>Position P4 | 154 | 8.2/<br>9.7/<br>11.2 | 16.0 | 17 01 154 1603<br>**17 01 154 2603** |   |
| Type A<br>CompactPCI<br>hot swap<br>Position P1 | 154 | 8.2/<br>9.7/<br>11.2 | 3.7 | 17 01 154 1204<br>**17 01 154 2204** |   |

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**
Connector dimensions see page 11.14





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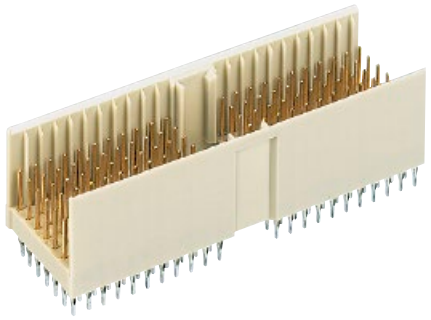
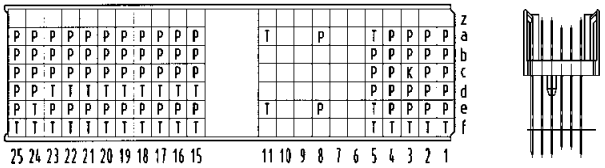
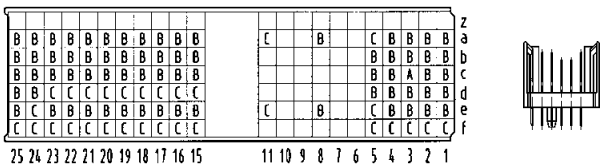
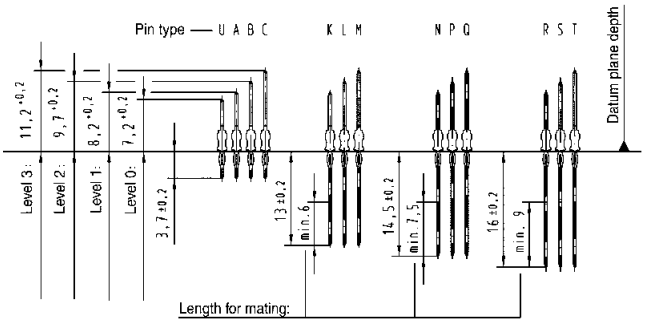


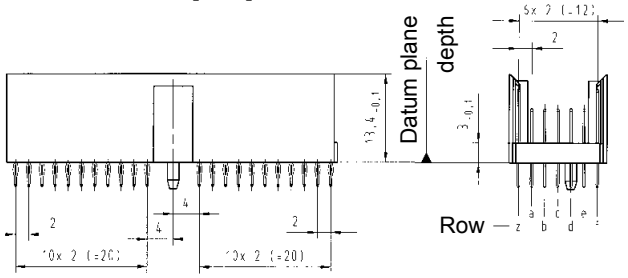
## Male connectors, straight

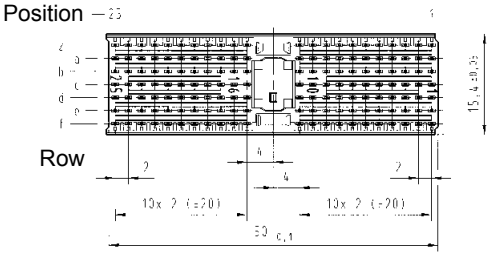
| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type A<br>CompactPCI<br>computer<br>telephony<br>Position P4 | 100 | 8.2/<br>9.7/<br>11.2 | 13.0/<br>14.5/<br>16.0 | 17 01 100 1001<br>**17 01 100 2001** |  |
| Type A<br>CompactPCI<br>computer<br>telephony<br>Position P4 | 100 | 8.2/<br>9.7/<br>11.2 | 3.7 | 17 01 100 1201<br>**17 01 100 2201** |  |

### Contact dimensions [mm]

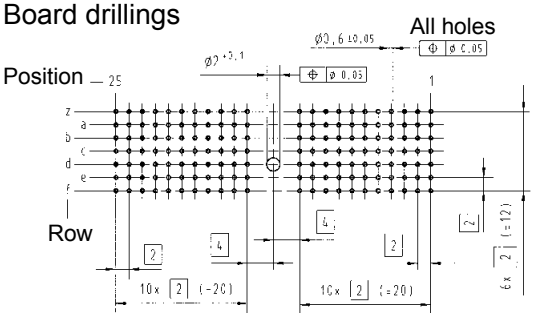



### Connector dimensions [mm]




### Board drillings






Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

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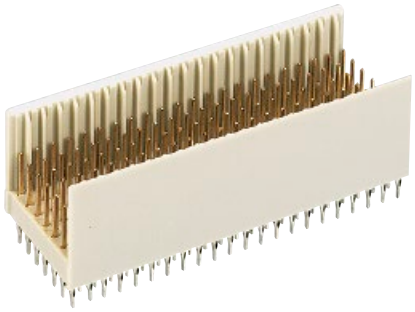
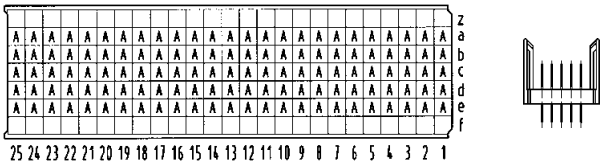
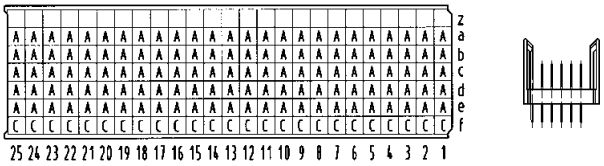
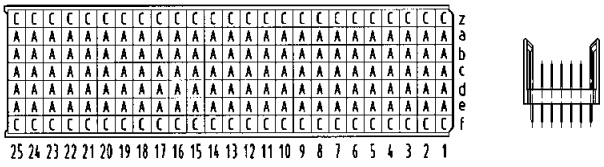
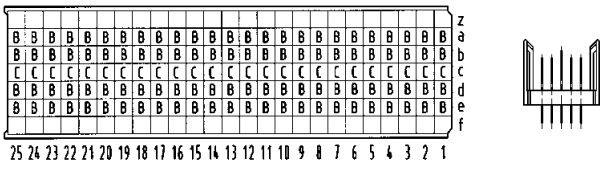
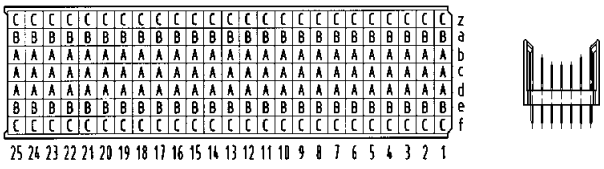
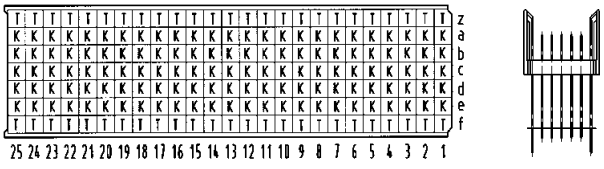


## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type $B_{25}$ | 125 | 8.2 | 3.7 | 17 02 125 1201<br>**17 02 125 2201** |  |
| Type $B_{25}$ | 150 | 8.2/<br>11.2 | 3.7 | 17 02 150 1201<br>**17 02 150 2201** |  |
| Type $B_{25}$ | 175 | 8.2/<br>11.2 | 3.7 | 17 02 175 1201<br>**17 02 175 2201** |  |
| Type $B_{25}$ | 125 | 9.7/<br>11.2 | 3.7 | 17 02 125 1205<br>**17 02 125 2205** |  |
| Type $B_{25}$ | 175 | 8.2/<br>9.7/<br>11.2 | 3.7 | 17 02 175 1202<br>**17 02 175 2202** |  |
| Type $B_{25}$ | 175 | 8.2/<br>11.2 | 13.0/<br>16.0 | 17 02 175 1006<br>**17 02 175 2006** |  |

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**
Connector dimensions see page 11.18



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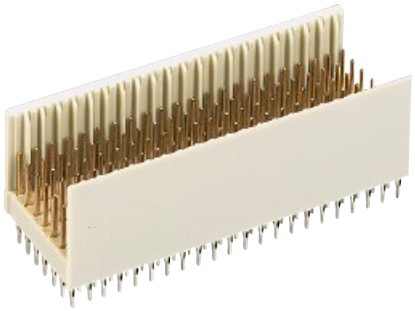
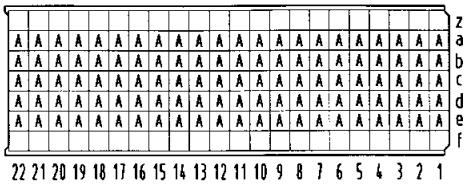
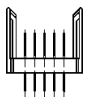
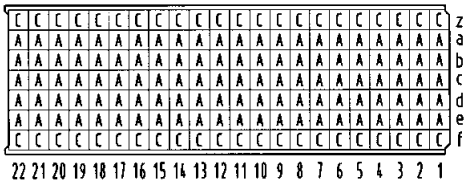
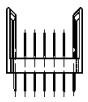
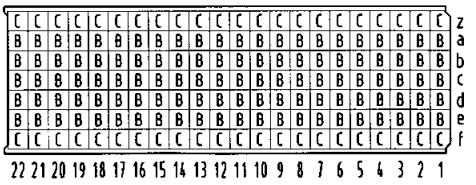
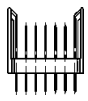
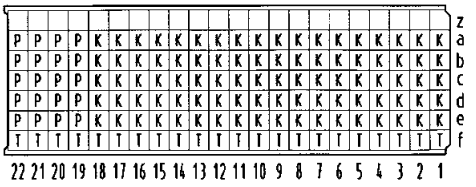
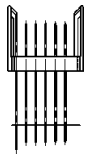
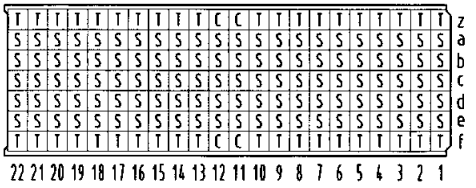
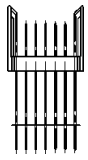
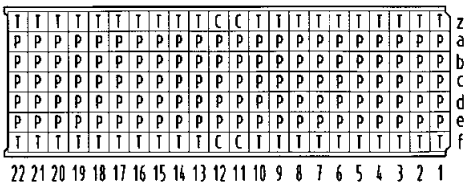
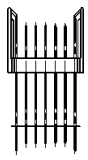


## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type $B_{22}$ | 110 | 8.2 | 3.7 | 17 04 110 1201<br>**17 04 110 2201** |   |
| Type $B_{22}$ | 154 | 8.2/<br>11.2 | 3.7 | 17 04 154 1201<br>**17 04 154 2201** |   |
| Type $B_{22}$<br>CompactPCI<br>Position P2 | 154 | 9.7/<br>11.2 | 3.7 | 17 04 154 1203<br>**17 04 154 2203** |   |
| Type $B_{22}$<br>CompactPCI<br>computer<br>telephony | 132 | 8.2/<br>9.7/<br>11.2 | 13.0/<br>14.5/<br>16.0 | 17 04 132 1001<br>**17 04 132 2001** |   |
| Type $B_{22}$<br>CompactPCI<br>AB friendly | 154 | 9.7/<br>11.2 | 3.7/<br>16.0 | 17 04 154 1010<br>**17 04 154 2010** |   |
| Type $B_{22}$<br>CompactPCI<br>AB friendly | 154 | 9.7/<br>11.2 | 3.7/<br>14.5/<br>16.0 | 17 04 154 1002<br>**17 04 154 2002** |   |

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**
Connector dimensions see page 11.18



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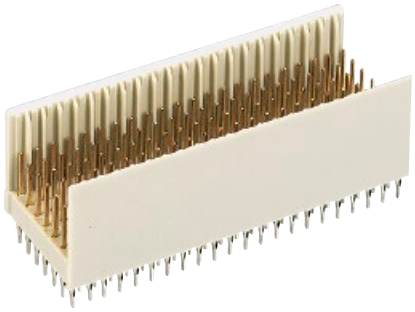
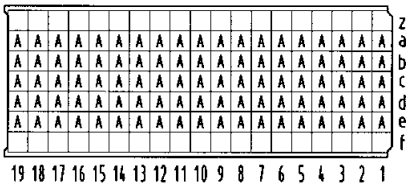
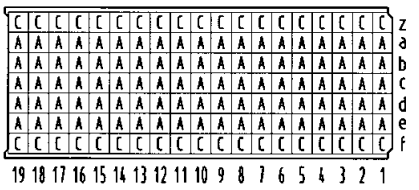
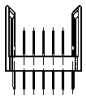
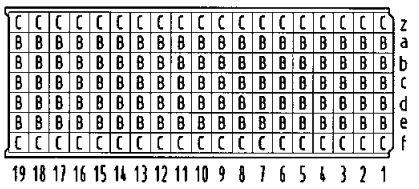
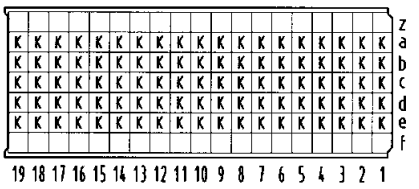
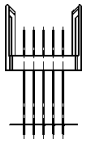
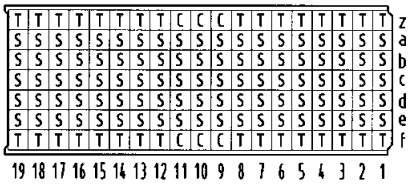
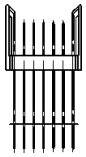
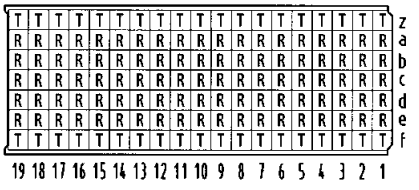


## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration | |
|---|---|---|---|---|---|---|
| Type $B_{19}$<br>VME<br>Position J0 | 95 | 8.2 | 3.7 | 17 05 095 1201<br>**17 05 095 2201** |  | |
| Type $B_{19}$<br>VME<br>Position J0 | 133 | 8.2/<br>11.2 | 3.7 | 17 05 133 1201<br>**17 05 133 2201** |  |  |
| Type $B_{19}$<br>VME<br>Position J0 | 133 | 9.7/<br>11.2 | 3.7 | 17 05 133 1203<br>**17 05 133 2203** |  | |
| Type $B_{19}$<br>VME<br>Position J0 | 95 | 8.2 | 13.0 | 17 05 095 1401<br>**17 05 095 2401** |  |  |
| Type $B_{19}$<br>CompactPCI<br>AB friendly<br>Position P3 | 133 | 9.7/<br>11.2 | 3.7/<br>16.0 | 17 05 133 1005<br>**17 05 133 2005** |  |  |
| Type $B_{19}$<br>Compact PCI<br>Position P3<br>VME<br>Position J0 | 133 | 8.2/<br>11.2 | 16.0 | 17 05 133 1602<br>**17 05 133 2602** |  | |

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**
Connector dimensions see page 11.18



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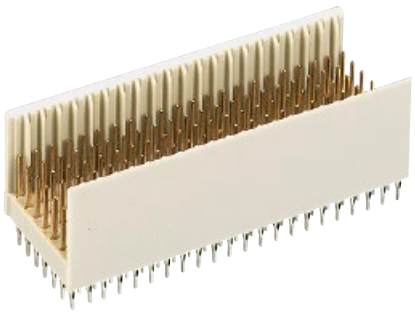
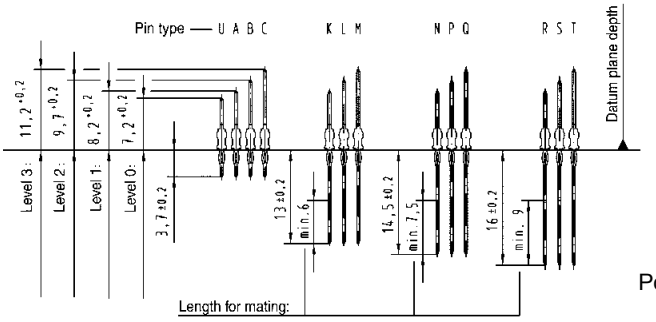


## Male connectors, straight

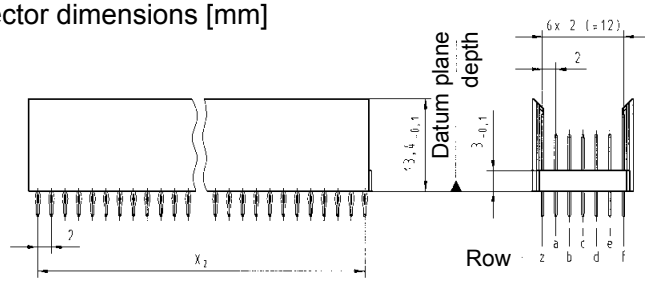
Drawing

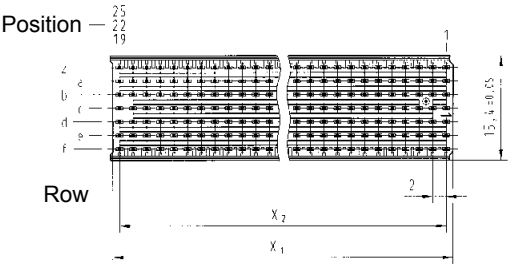
Dimensions in mm

### Contact dimensions [mm]

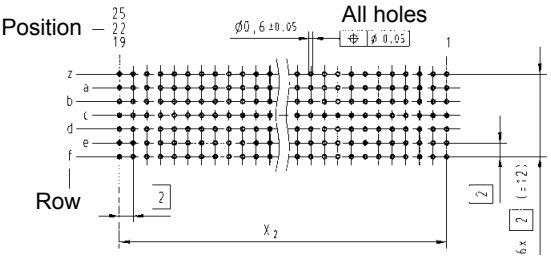



### Connector dimensions [mm]




### Board drillings




| Contact positions | $x_1$ | $x_2$ |
|---|---|---|
| 19 | 37.9 | 18 x 2 (= 36) |
| 22 | 43.9 | 21 x 2 (= 42) |
| 25 | 49.9 | 24 x 2 (= 48) |



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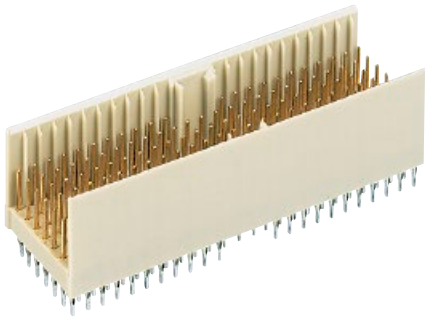
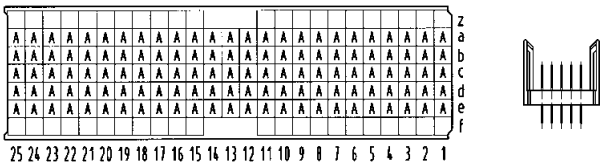
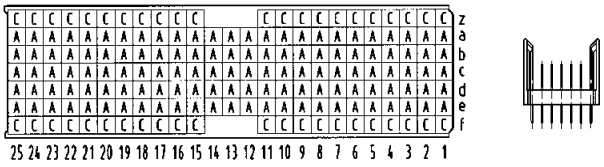
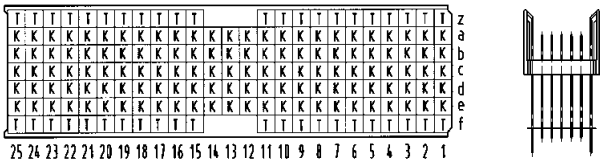
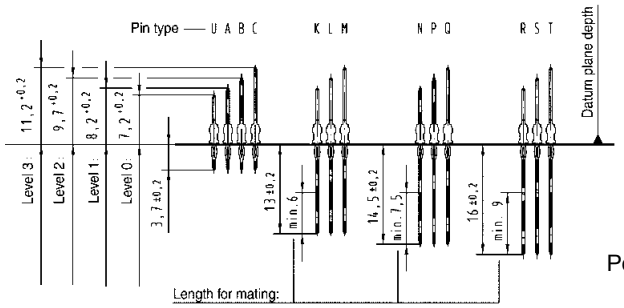


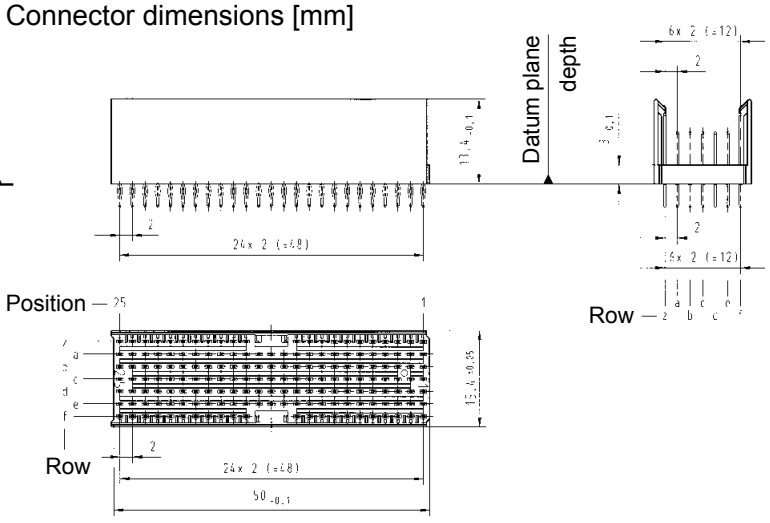
## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type AB25 | 125 | 8.2 | 3.7 | 17 15 125 1201<br>**17 15 125 2201** |  |
| Type AB25 | 169 | 8.2/<br>11.2 | 3.7 | 17 15 169 1201<br>**17 15 169 2201** |  |
| Type AB25 | 169 | 8.2/<br>11.2 | 13.0/<br>16.0 | 17 15 169 1003<br>**17 15 169 2003** |  |

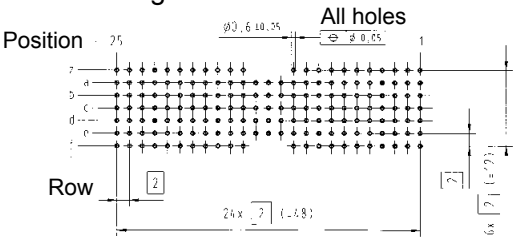
### Contact dimensions [mm]




### Connector dimensions [mm]




### Board drillings




Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**



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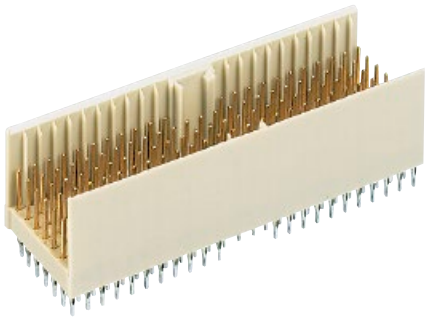
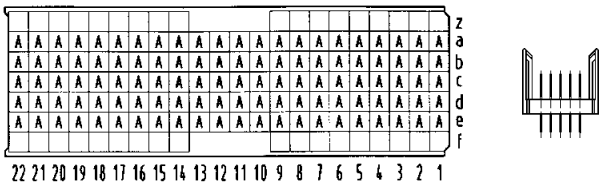
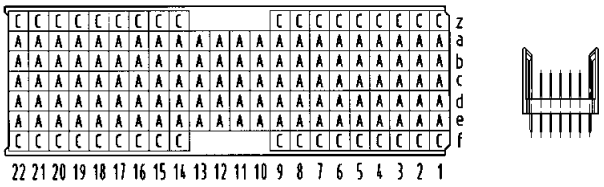
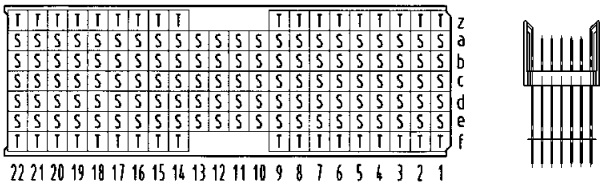
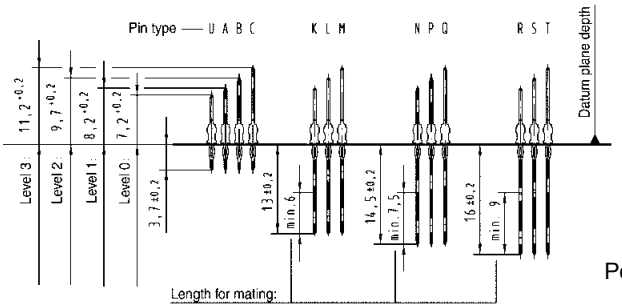


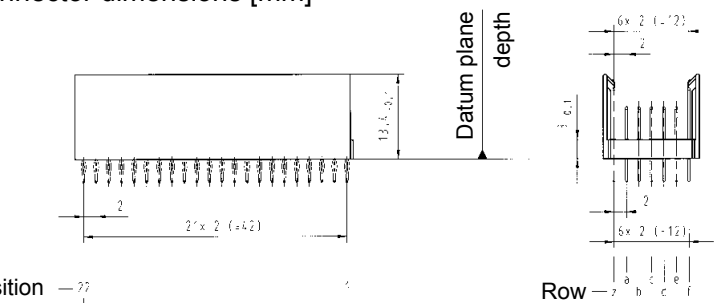
## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type AB22 | 110 | 8.2 | 3.7 | 17 14 110 1201<br>**17 14 110 2201** |  |
| Type AB22 | 146 | 8.2/<br>11.2 | 3.7 | 17 14 146 1201<br>**17 14 146 2201** |  |
| Type AB22 | 146 | 9.7/<br>11.2 | 16.0 | 17 14 146 1601<br>**17 14 146 2601** |  |

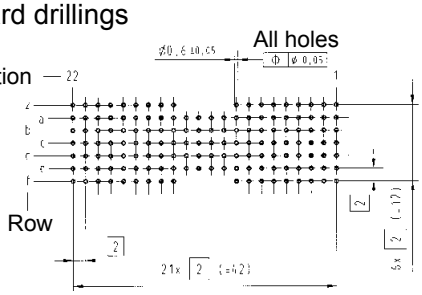
### Contact dimensions [mm]




### Connector dimensions [mm]




### Board drillings






Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

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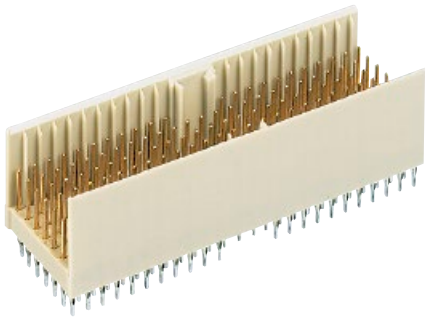
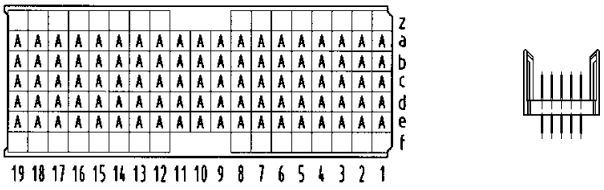
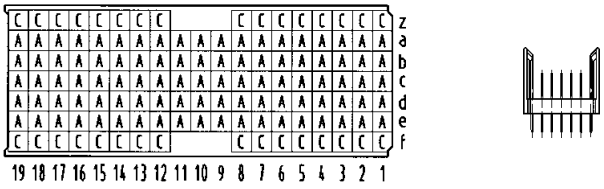
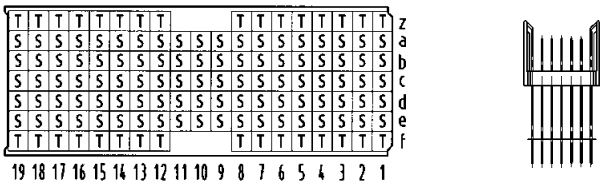
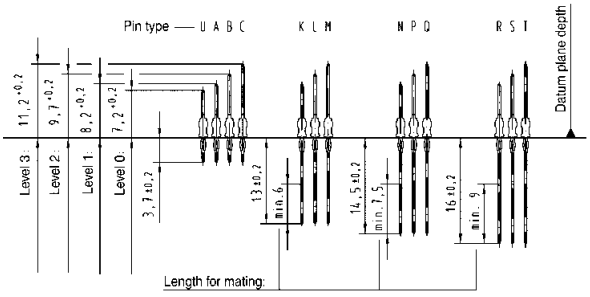


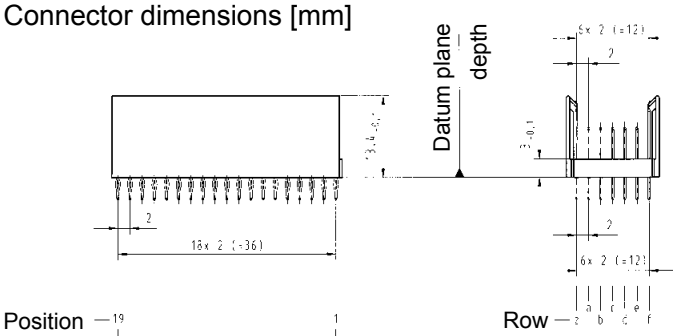
## Male connectors, straight

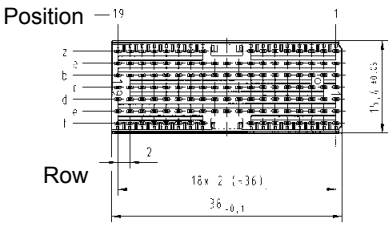
| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type AB19 | 95 | 8.2 | 3.7 | 17 13 095 1201<br>**17 13 095 2201** |  |
| Type AB19 | 127 | 8.2/<br>11.2 | 3.7 | 17 13 127 1201<br>**17 13 127 2201** |  |
| Type AB19 | 127 | 9.7/<br>11.2 | 16.0 | 17 13 127 1601<br>**17 13 127 2601** |  |

### Contact dimensions [mm]

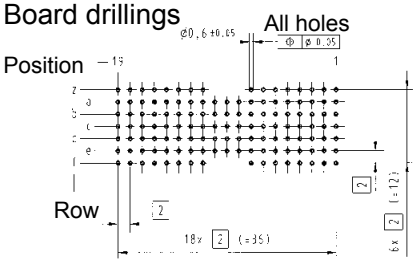



### Connector dimensions [mm]




### Board drillings




Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**



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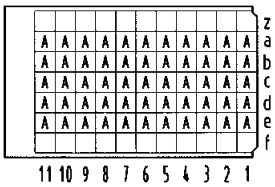
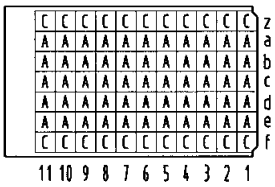
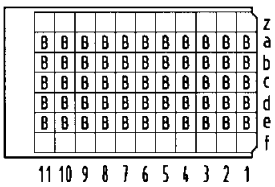
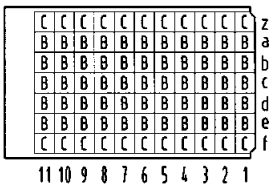
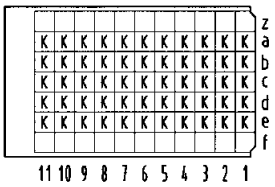
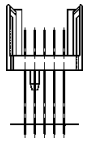
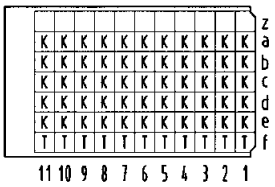
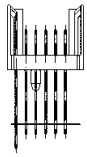
## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type C | 55 | 8.2 | 3.7 | 17 03 055 1201<br>**17 03 055 2201** |  |
| Type C | 77 | 8.2/<br>11.2 | 3.7 | 17 03 077 1201<br>**17 03 077 2201** |  |
| Type C | 55 | 9.7 | 3.7 | 17 03 055 1202<br>**17 03 055 2202** |  |
| Type C | 77 | 9.7/<br>11.2 | 3.7 | 17 03 077 1202<br>**17 03 077 2202** |  |
| Type C | 55 | 8.2 | 13.0 | 17 03 055 1401<br>**17 03 055 2401** |   |
| Type C | 66 | 8.2/<br>11.2 | 13.0/<br>16.0 | 17 03 066 1001<br>**17 03 066 2001** |   |

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**
Connector dimensions see page 11.23



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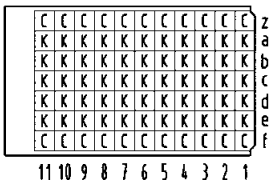
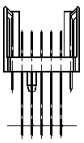
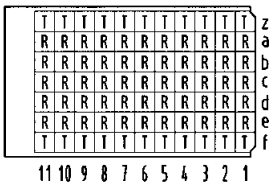
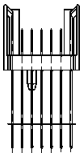
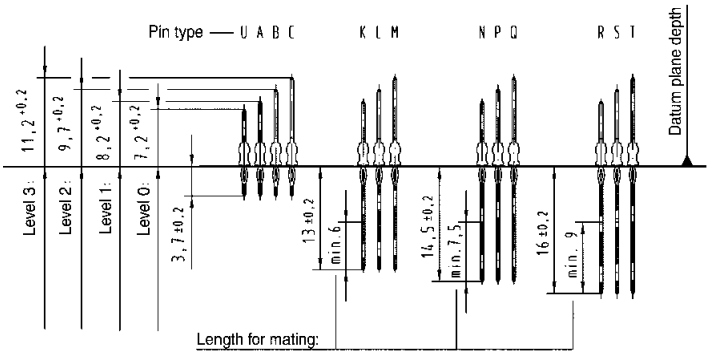
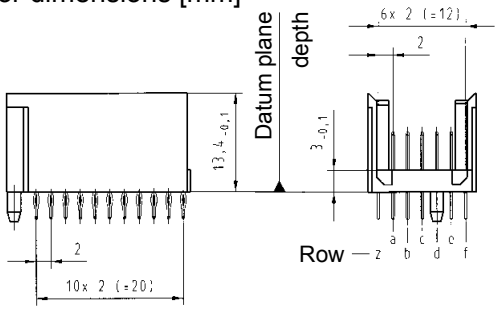
## Male connectors, straight

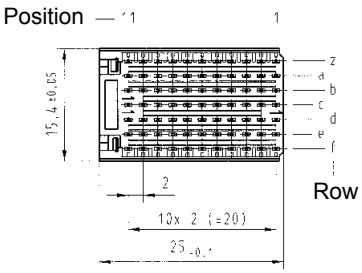
| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type C | 77 | 8.2/ 11.2 | 3.7/ 13.0 | 17 03 077 1001<br>**17 03 077 2001** |   |
| Type C | 77 | 8.2/ 11.2 | 16.0 | 17 03 077 1601<br>**17 03 077 2601** |   |

### Contact dimensions [mm]

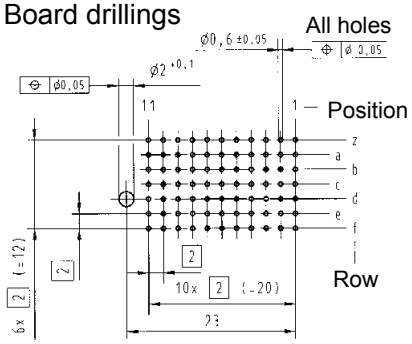



### Connector dimensions [mm]




### Board drillings




Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**



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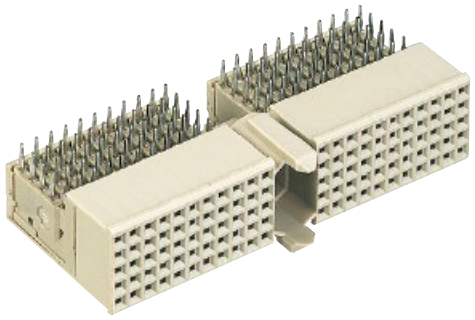
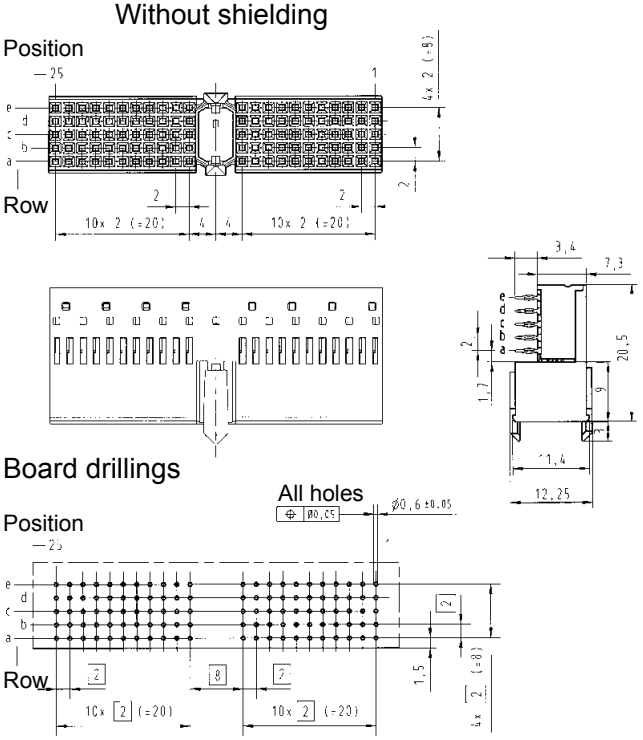


## Female connectors, angled

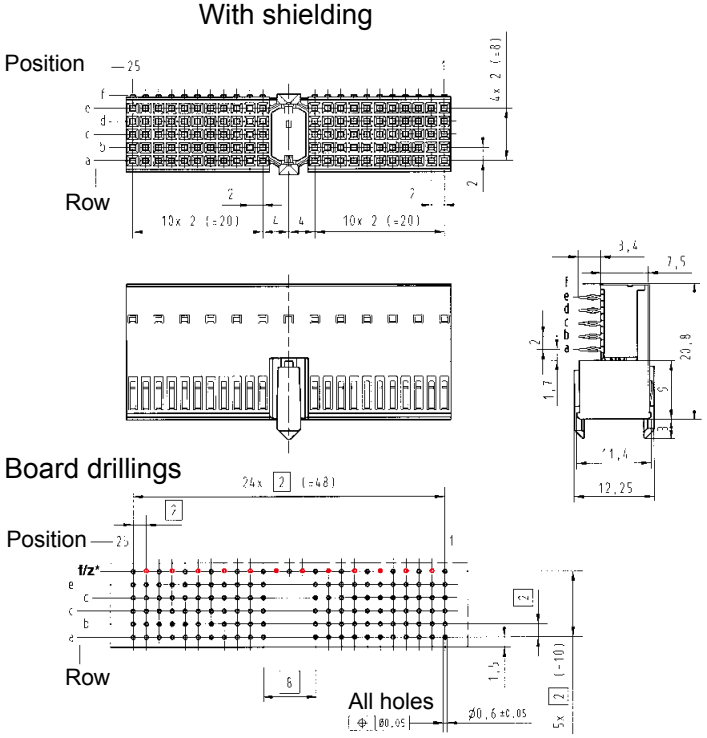
| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| Type A | 110 | 3.4 | 17 21 110 1101<br>**17 21 110 2101** |
| Type A with upper shield<br>CompactPCI<br>Positions J1, J4 | 110 | 3.4 | 17 21 110 1102<br>**17 21 110 2102** |
| Lower shield for type A connectors | | | 17 21 000 4102 |
| Type A with split upper shield<br>CompactPCI computer telephony<br>Position J4 | 90 | 3.4 | 17 21 090 1103<br>**17 21 090 2103** |
| Lower shield for type A connectors (rows 1 – 5)<br>CompactPCI computer telephony | | | 17 29 000 4102 |
| Lower shield for type A connectors (rows 15 – 25)<br>CompactPCI computer telephony | | | 17 23 000 4102 |

Dimensions [mm]

Without shielding




With shielding






Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

* hole on even contact numbers only needed for lower shielding

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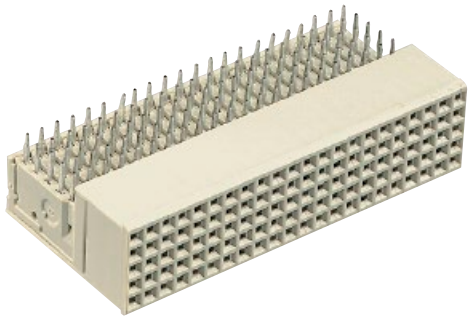


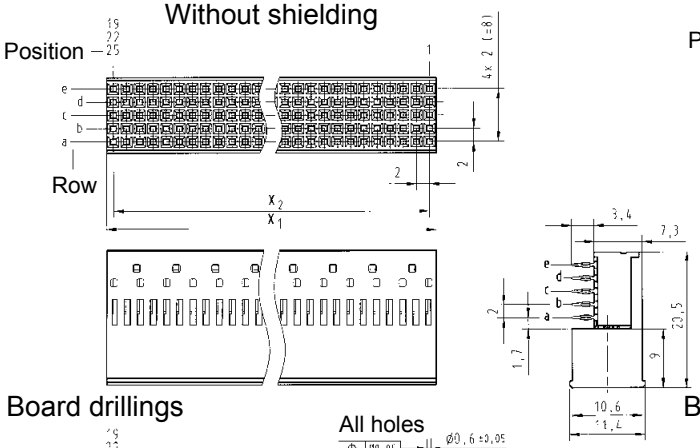
## Female connectors, angled

| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| Type $B_{19}$<br>VME, Position P0 | 95 | 3.4 | 17 25 095 1101<br>**17 25 095 2101** |
| Type $B_{19}$ with upper shield<br>CompactPCI, Position J3 – VME, Position P0 | 95 | 3.4 | 17 25 095 1102<br>**17 25 095 2102** |
| Lower shield for type $B_{19}$ connectors | | | 17 25 000 4102 |
| Type $B_{22}$ | 110 | 3.4 | 17 24 110 1101<br>**17 24 110 2101** |
| Type $B_{22}$ with upper shield<br>CompactPCI, Positions J2, J5 | 110 | 3.4 | 17 24 110 1102<br>**17 24 110 2102** |
| Lower shield for type $B_{22}$ connectors | | | 17 24 000 4102 |
| Type $B_{25}$ | 125 | 3.4 | 17 22 125 1101<br>**17 22 125 2101** |
| Type $B_{25}$ with upper shield | 125 | 3.4 | 17 22 125 1102<br>**17 22 125 2102** |
| Lower shield for type $B_{25}$ connectors | | | 17 22 000 4102 |

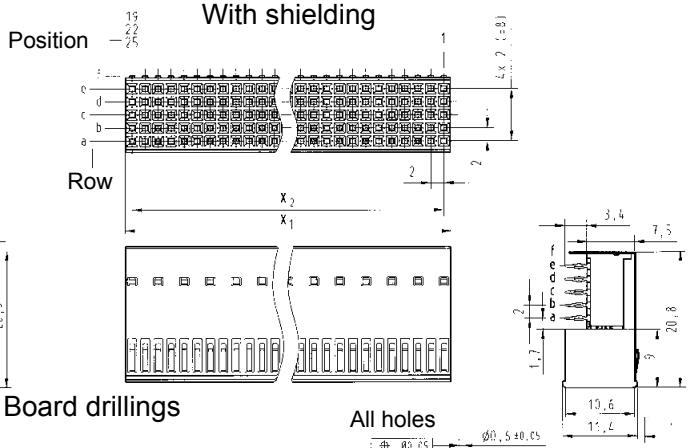
Dimensions [mm]

| Contact positions | $x_1$ | $x_2$ |
|---|---|---|
| 19 | 37.9 | 18 x 2 (= 36) |
| 22 | 43.9 | 21 x 2 (= 42) |
| 25 | 49.9 | 24 x 2 (= 48) |

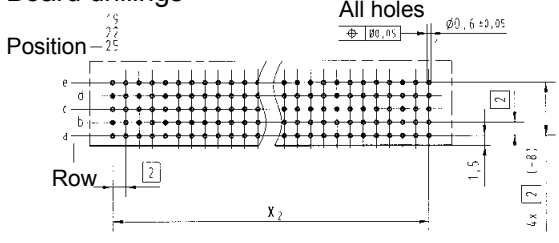
Without shielding



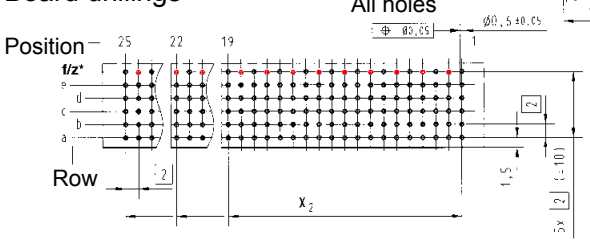

With shielding




Board drillings




Board drillings




Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

* hole on even contact numbers only needed for lower shielding



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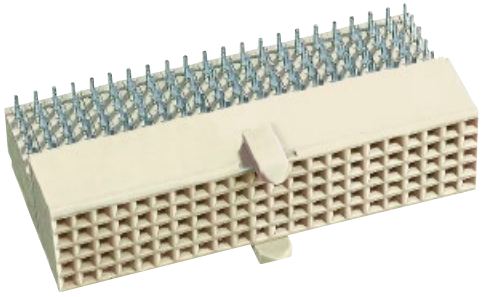


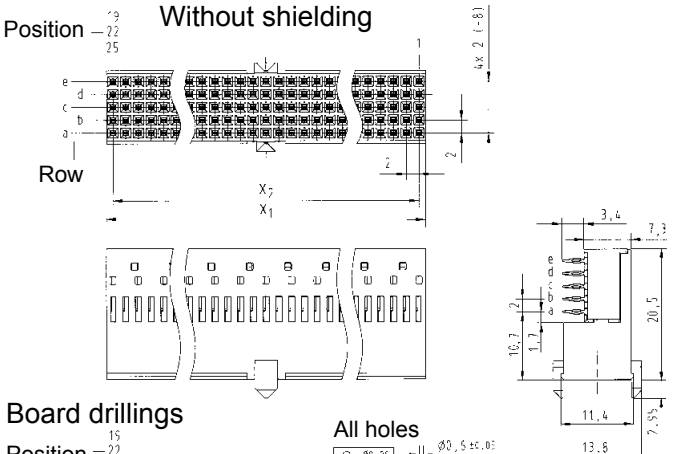
## Female connectors, angled

| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| Type $AB_{19}$ | 95 | 3.4 | 17 33 095 1101<br>**17 33 095 2101** |
| Type $AB_{19}$ with upper shield<br>CompactPCI, Position RJ3 | 95 | 3.4 | 17 33 095 1102<br>**17 33 095 2102** |
| Lower shield for type $AB_{19}$ connectors | | | 17 33 000 4102 |
| Type $AB_{22}$ | 110 | 3.4 | 17 34 110 1101<br>**17 34 110 2101** |
| Type $AB_{22}$ with upper shield<br>CompactPCI, Positions RJ2, RJ5 | 110 | 3.4 | 17 34 110 1102<br>**17 34 110 2102** |
| Lower shield for type $AB_{22}$ connectors | | | 17 34 000 4102 |
| Type $AB_{25}$ | 125 | 3.4 | 17 35 125 1101<br>**17 35 125 2101** |
| Type $AB_{25}$ with upper shield | 125 | 3.4 | 17 35 125 1102<br>**17 35 125 2102** |
| Lower shield for type $AB_{25}$ connectors | | | 17 21 000 4102 |

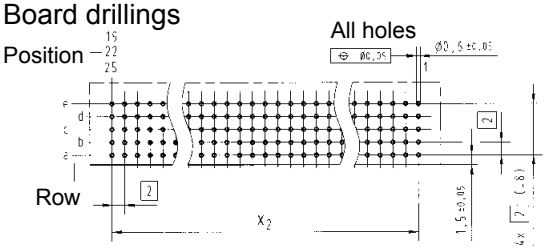
Dimensions [mm]

| Contact positions | $x_1$ | $x_2$ |
|---|---|---|
| 19 | 37.9 | 18 x 2 (= 36) |
| 22 | 43.9 | 21 x 2 (= 42) |
| 25 | 49.9 | 24 x 2 (= 48) |

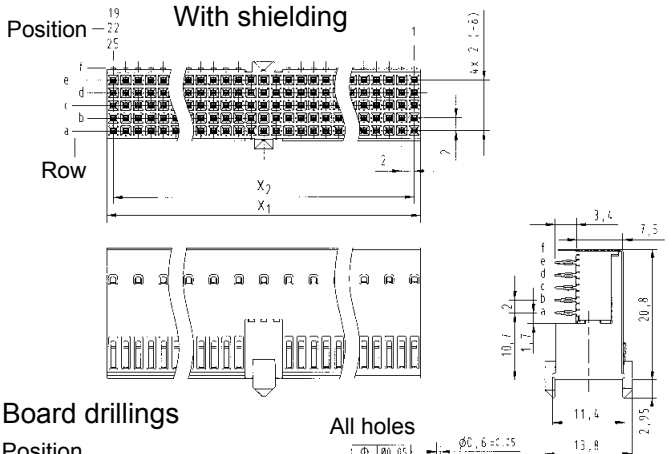
Without shielding



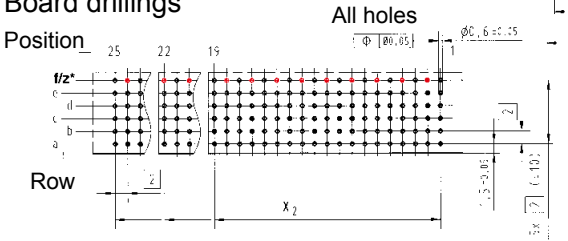

Board drillings




With shielding




Board drillings






Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

* hole on even contact numbers only needed for lower shielding

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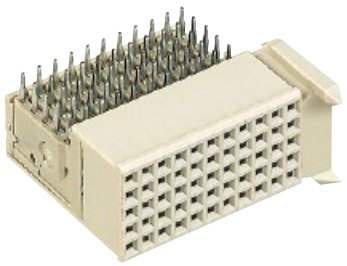
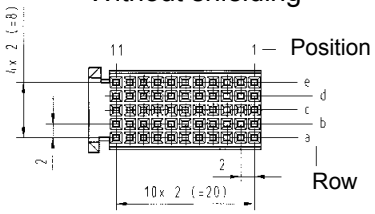
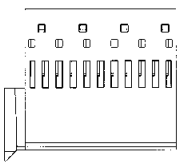


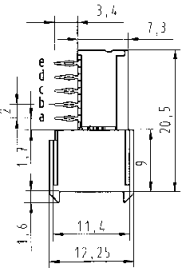
## Female connectors, angled

| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| Type C | 55 | 3.4 | 17 23 055 1101<br>**17 23 055 2101** |
| Type C with upper shield | 55 | 3.4 | 17 23 055 1102<br>**17 23 055 2102** |
| Lower shield for type C connectors | | | 17 23 000 4102 |

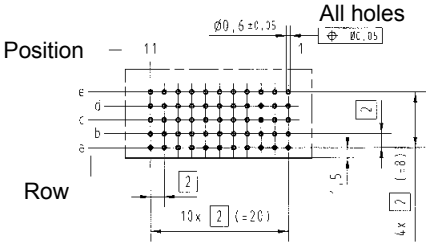
Without shielding



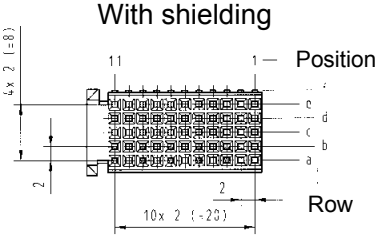



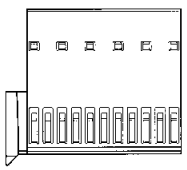


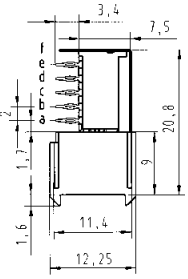

Board drillings



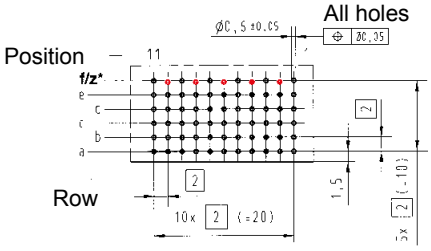

With shielding






Board drillings




Dimensions [mm]

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

* hole on even contact numbers only needed for lower shielding



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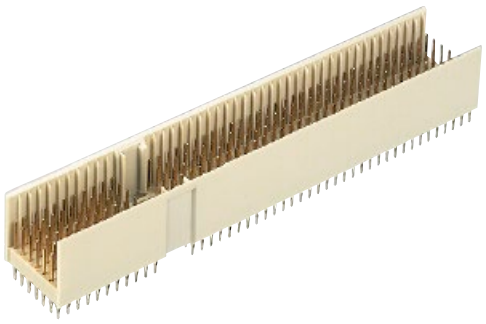
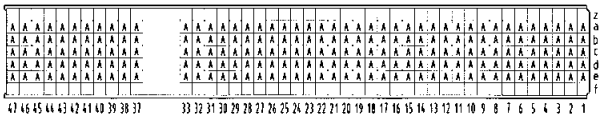
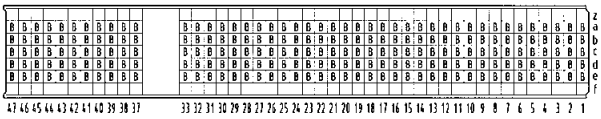
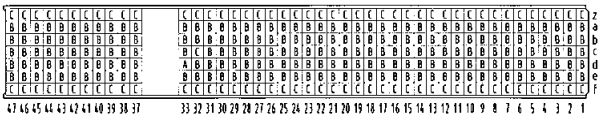
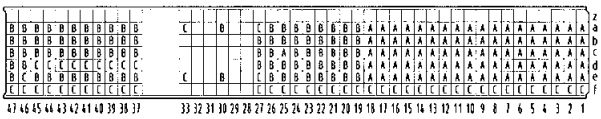


## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type Monoblock 47 | 220 | 8.2 | 3.7 | 17 06 220 1201<br>**17 06 220 2201** |  |
| Type Monoblock 47 | 308 | 8.2/ 11.2 | 3.7 | 17 06 308 1201<br>**17 06 308 2201** | |
| Type Monoblock 47 | 220 | 9.7 | 3.7 | 17 06 220 1202<br>**17 06 220 2202** |  |
| Type Monoblock 47<br>CompactPCI Positions P1 and P2 | 308 | 8.2/ 9.7/ 11.2 | 3.7 | 17 06 308 1202<br>**17 06 308 2202** |  |
| Type Monoblock 47<br>CompactPCI hot swap | 308 | 8.2/ 9.7/ 11.2 | 3.7 | 17 06 308 1203<br>**17 06 308 2203** | |
| Type Monoblock 47<br>CompactPCI computer telephony | 232 | 8.2/ 9.7/ 11.2 | 3.7 | 17 06 232 1201<br>**17 06 232 2201** |  |

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**
Connector dimensions see page 11.29



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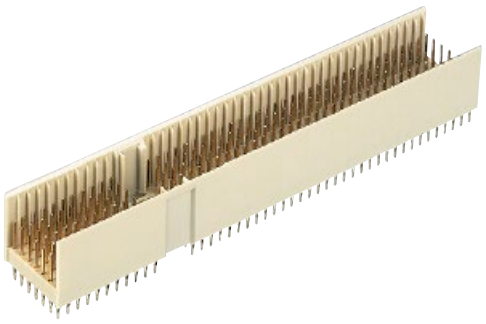
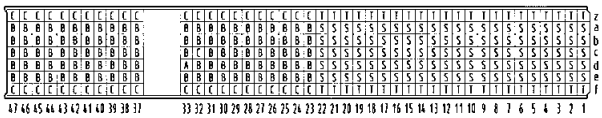
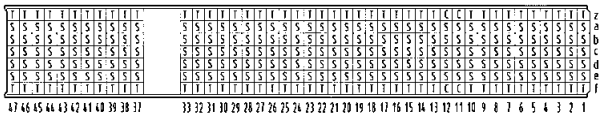
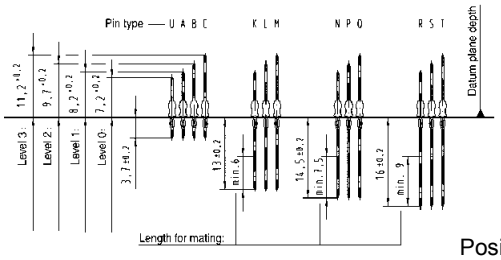


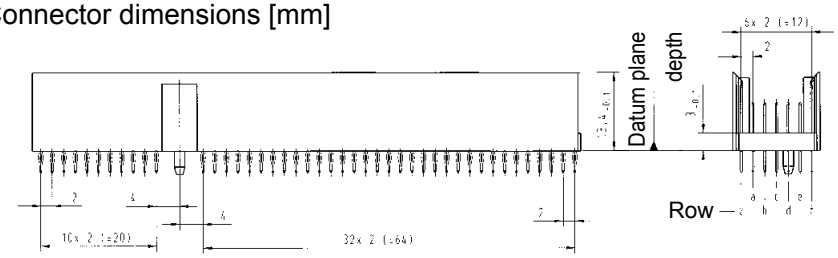
## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type Monoblock 47<br>CompactPCI<br>I/O | 308 | 8.2/<br>9.7/<br>11.2 | 3.7/<br>16.0 | 17 06 308 1001<br>**17 06 308 2001** |  |
| Type Monoblock 47<br>CompactPCI<br>AB friendly<br>Positions P4<br>and P5 | 308 | 9.7/<br>11.2 | 3.7/<br>16.0 | 17 06 308 1005<br>**17 06 308 2005** |  |

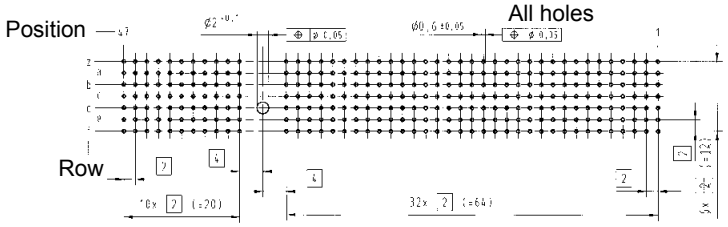
### Contact dimensions [mm]




### Connector dimensions [mm]




### Board drillings








Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

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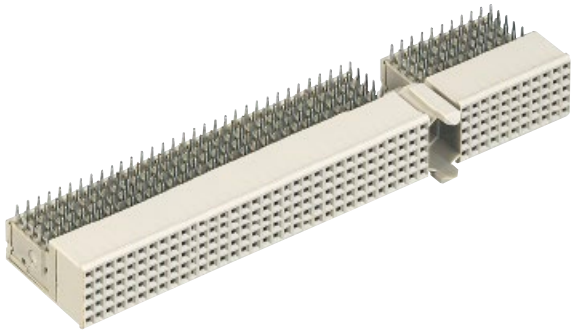
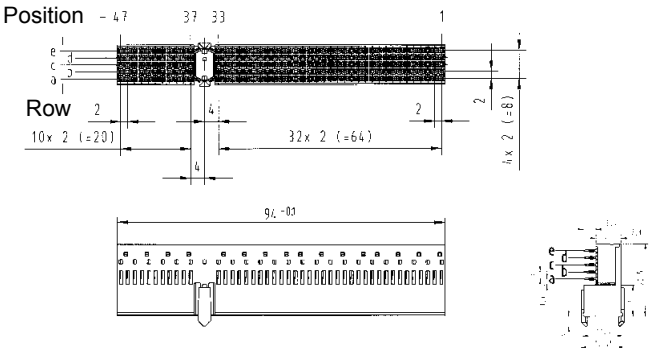


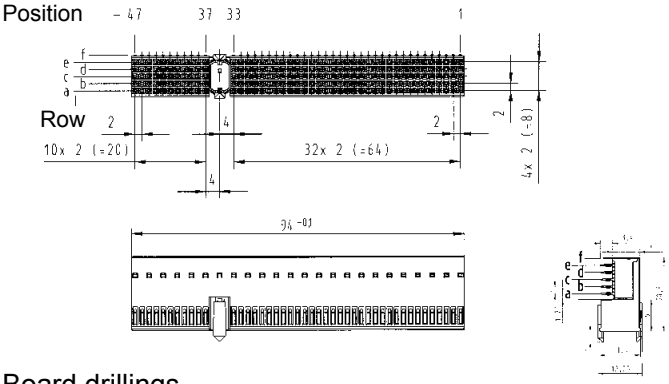
## Female connectors, angled

| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| Type Monoblock 47 | 220 | 3.4 | 17 26 220 1101<br>**17 26 220 2101** |
| Type Monoblock 47 with upper shield | 220 | 3.4 | 17 26 220 1102<br>**17 26 220 2102** |
| Type Monoblock 47 with upper shield<br>CompactPCI computer telephony | 200 | 3.4 | 17 26 200 1103<br>**17 26 200 2103** |
| Lower shield for type Monoblock 47 connectors | | | 17 26 000 4102 |
| Lower shield for type Monoblock 47 connectors (rows 1 – 22)<br>CompactPCI computer telephony | | | 17 24 000 4102 |
| Lower shield for type Monoblock 47 connectors (rows 23 – 27)<br>CompactPCI computer telephony | | | 17 29 000 4102 |
| Lower shield for type Monoblock 47 connectors (rows 37 – 47)<br>CompactPCI computer telephony | | | 17 23 000 4102 |

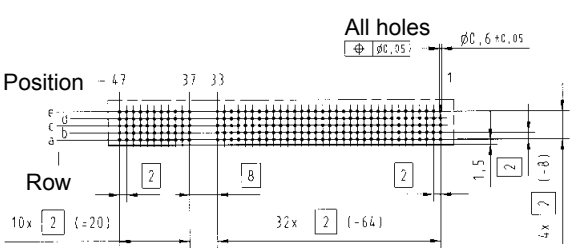
### Without shielding



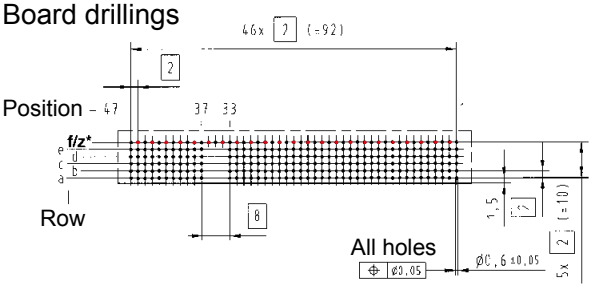

### With shielding




### Board drillings




### Board drillings




Dimensions [mm]

Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

* hole on even contact numbers only needed for lower shielding



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# Notes





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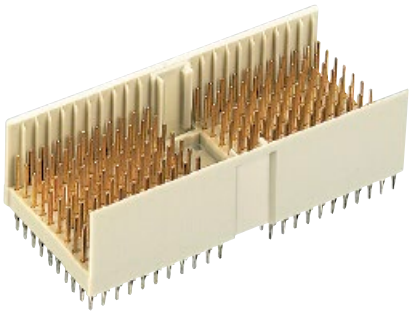
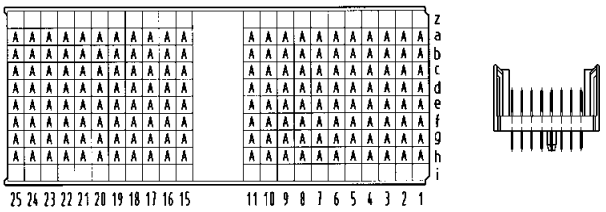
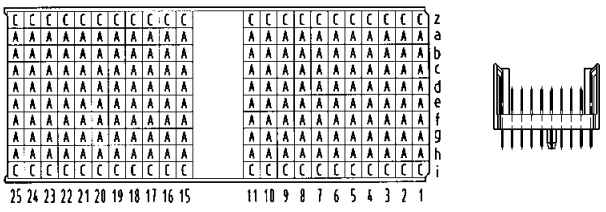
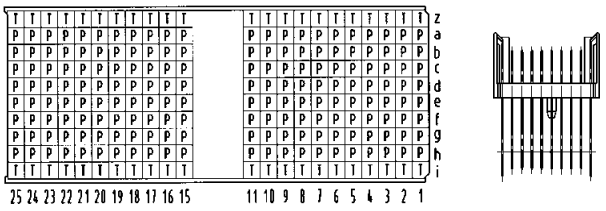
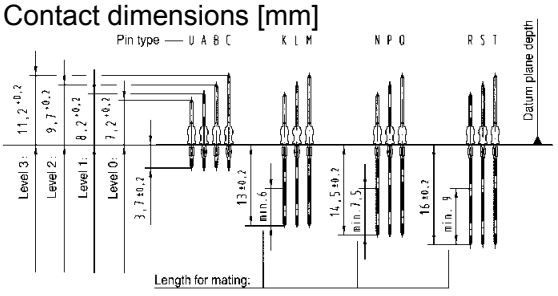


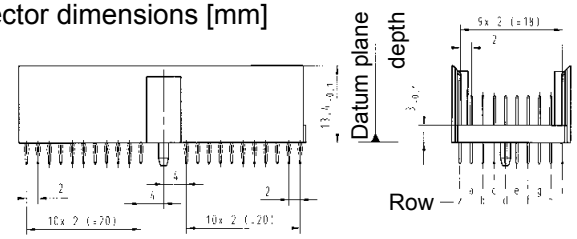
## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type D | 176 | 8.2 | 3.7 | 17 11 176 1201<br>**17 11 176 2201** |  |
| Type D | 220 | 8.2/<br>11.2 | 3.7 | 17 11 220 1201<br>**17 11 220 2201** |  |
| Type D | 220 | 9.7/<br>11.2 | 14.5/<br>16.0 | 17 11 220 1001<br>**17 11 220 2001** |  |

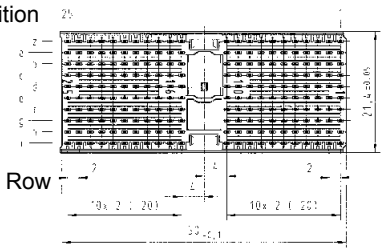
### Contact dimensions [mm]



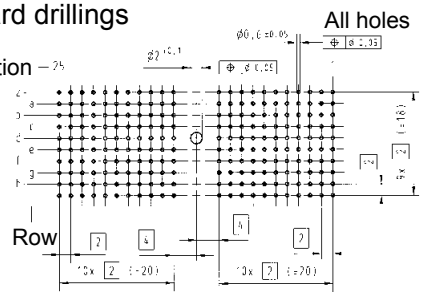

### Connector dimensions [mm]




Position




### Board drillings






Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**

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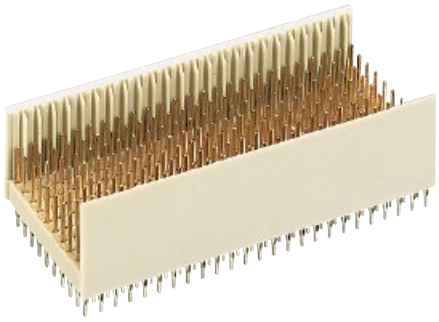
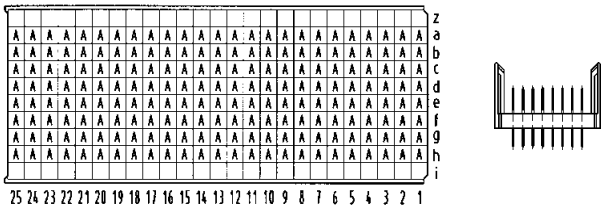
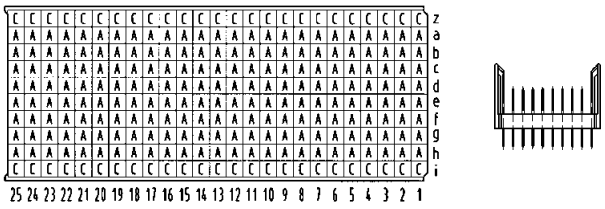
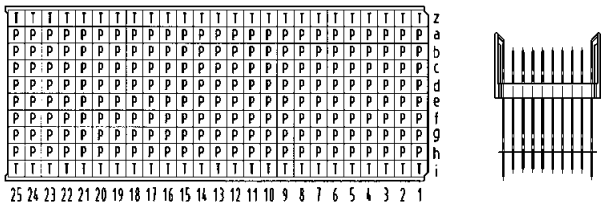
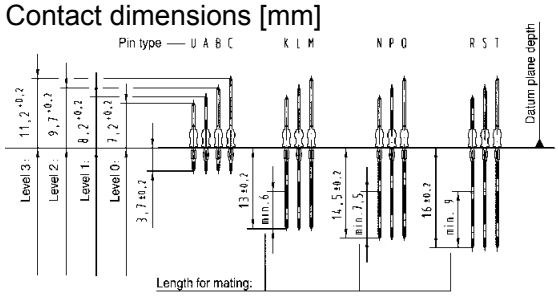


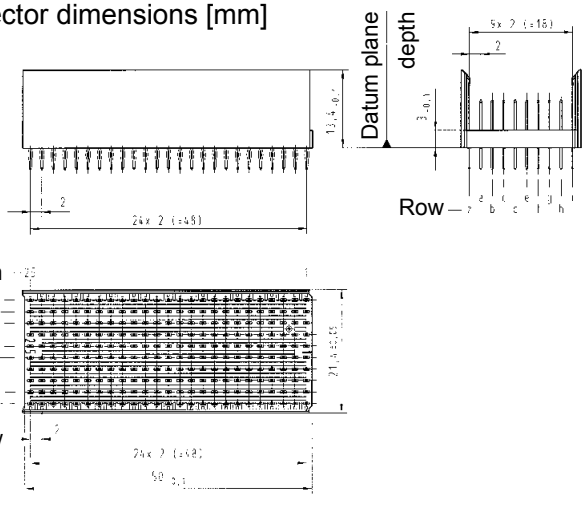
## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type E | 200 | 8.2 | 3.7 | 17 12 200 1201<br>**17 12 200 2201** |  |
| Type E | 250 | 8.2/<br>11.2 | 3.7 | 17 12 250 1201<br>**17 12 250 2201** |  |
| Type E | 250 | 9.7/<br>11.2 | 14.5/<br>16.0 | 17 12 250 1001<br>**17 12 250 2001** |  |

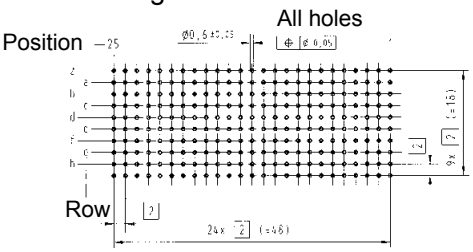
### Contact dimensions [mm]




### Connector dimensions [mm]




### Board drillings




Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**



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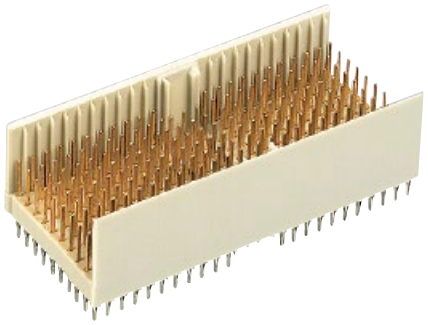
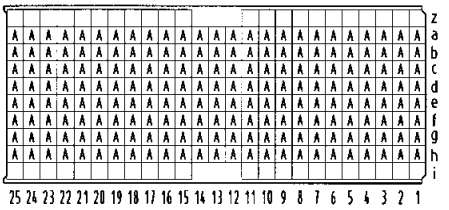
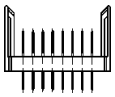
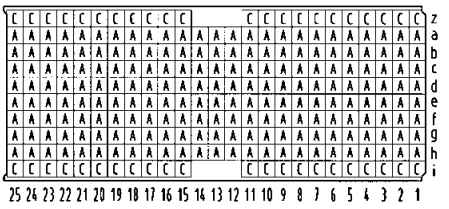
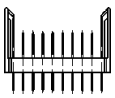
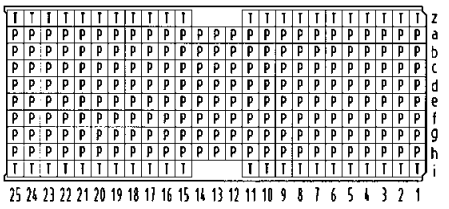
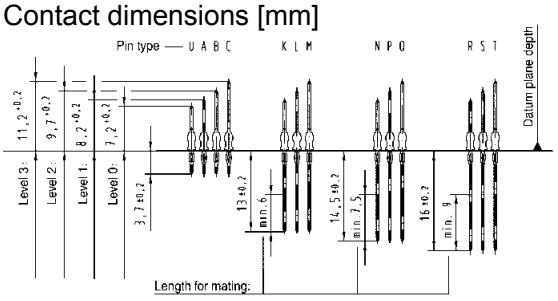


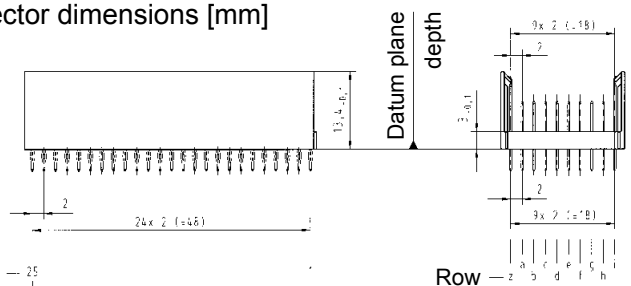
## Male connectors, straight

| Identification | No. of contacts | Contact length [mm] mating side | Contact length [mm] termination side | Part number | Contact configuration |
|---|---|---|---|---|---|
| Type DE | 200 | 8.2 | 3.7 | 17 10 200 1201<br>**17 10 200 2201** |   |
| Type DE | 244 | 8.2/<br>11.2 | 3.7 | 17 10 244 1201<br>**17 10 244 2201** |   |
| Type DE | 244 | 9.7/<br>11.2 | 14.5/<br>16.0 | 17 10 244 1001<br>**17 10 244 2001** |  |

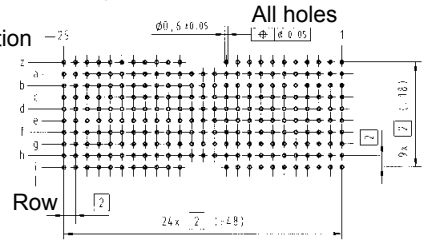
### Contact dimensions [mm]




### Connector dimensions [mm]




### Board drillings




Thin print part numbers: performance level 1
**Bold print part numbers: performance level 2**



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# Notes





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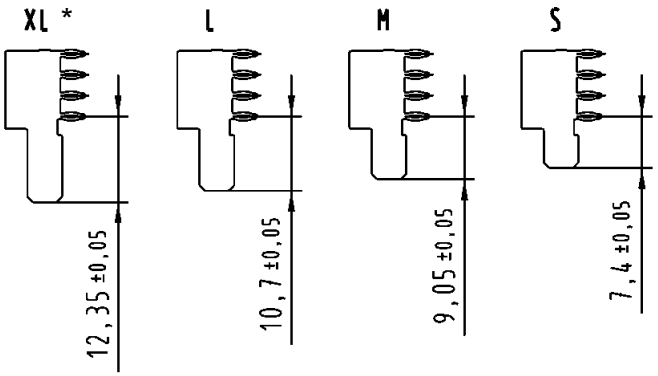
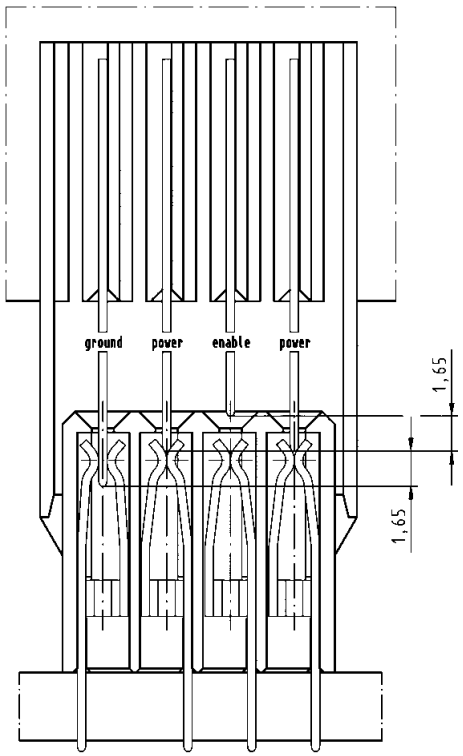
The har:bus® HM Power connector is designed according to the OBSAI Specification V 1.1. It is well-suited to be used in conjunction with 2 mm har:bus® HM connectors. The durability is according to IEC 61076-4-101 (250 mating cycles).

The straight female connector for the backplane is fitted with press-in contacts, the right angled male connector for daugther cards can be supplied with either, press-in or PIHIR (Pin In Hole Intrusive Reflow) termination.

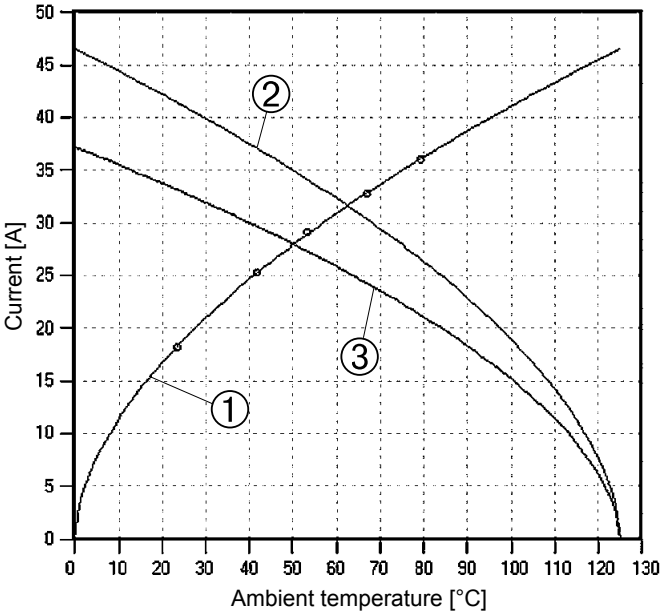



The compact, high temperature moulding can be loaded with up to four high current contacts. Four different contact lengths are available from 7.4 mm to 12.35 mm. This makes sequenced and non-sequenced loadings possible (e.g. with GND and ENA). Any other contact assignments, also partially loaded, are available on request.




Loaded with four power contacts, each contact can carry up to 20 A @ 70 °C / 80 % derating.

**With a configuration of two power contacts, GND and ENA, the current carrying capacity is even up to 23 A @ 70 °C / 80 % derating per contact.**




① Temperature raise
② Derating
③ Derating curve at $I_{max}$ x 0.8 (DIN EN 60512-5-2)

The distance between adjacent contacts is 3 mm, which enables wider pcb traces, larger solder paste areas and an improved heat dissipation. For the female backplane connector no special tooling is necessary due to the flatrock design. For the male connector HARTING offers a special press-in tool (see chapter 20).

HARTING's har:bus® HM Signal and Power connectors meet OBSAI (Open Base Station Architecture Initiative) specifications and provide a reliable and cost effective solution for connecting plug-in units to the backplane. The connector solutions available from the HARTING technology group will offer full compatibility and intermateability with base station modules.

## Benefits:

- Small form factor
- High current rating up to 23 A per contact (OBSAI configuration)
- 3 level staggering (or even 4)
- Flatrock design
- Matched with har:bus® HM 2 mm connectors



* Type XL on request

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| | | |
|---|---|---|
| Design according | : | OBSAI System Spezifikation V 1.1 |
| Approvals | | |
| Underwriters Laboratories Inc.® | : | c UL us with their respective ratings documented in file E 102079 |
| Number of contacts | : | up to 4 |
| Contact spacing | : | 3.00 mm |
| Clearance and creepage distances between contacts | : | > 2.3 mm |
| Working current | : | 23 A max. (OBSAI configuration)<br>20 A max. (fully loaded with power contacts) |
| Test voltage $U_{r.m.s.}$ | : | AC 1500 V min. |
| Contact resistance | : | < 1 mΩ |
| Insulation resistance: | : | > 10 GΩ |
| Temperature range | : | - 55 °C ... + 125 °C |
| during reflow soldering | | 220 °C for 2 minutes, 260 °C max. short-term |
| Durability as per IEC 61076-4-101 | : | *Performance level 2 = 250 mating cycles in total.*<br>First 125 mating cycles, then 4 days gas test using 0.5 ppm $SO_2$ and 0.1 ppm $H_2S$ (at 25 + 2 °C and 75 + 3 % humidity). Measurement of contact resistance.<br>The remaining 125 mating cycles are subject to measurement of contact resistance and visual inspection. No abrasion of the contact finish through to the base material. No functional impairment. |
| Termination technique | | |
| Male connectors | : | Press-in or solder termination, suitable for (lead-free) pin-in-hole reflow soldering |
| Female connectors | : | Press-in termination |
| Mating force | : | max. 4 N / contact |
| Withdrawal force | : | min. 0.5 N / contact |
| Materials | | |
| Mouldings | : | Thermoplastic resin, glass-fibre filled, UL 94-V0 |
| Contacts | : | Copper alloy |
| Contact surface | : | Selectively gold plated (contact zone) |
| Contact styles | : | Standard, leading, lagging |
| Packaging | | |
| Tube | : | Male and female connectors |
| Tape & Reel | : | On request for male solder connectors |





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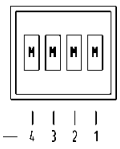
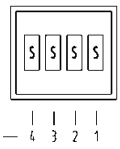
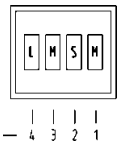
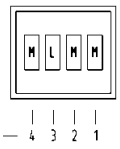
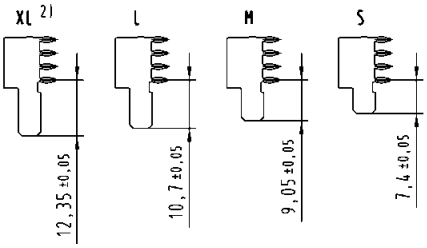
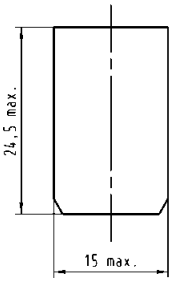
## Male connectors angled, with press-in termination

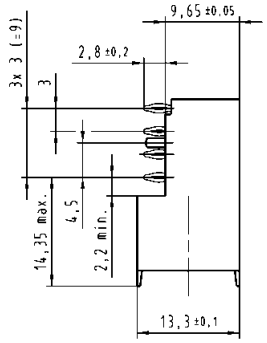
| Identification | No. of contacts | Contact length [mm] termination side | Part number | Contact loading |
|---|---|---|---|---|
| Connector<br>with same sized contacts | 4 | 2.8 | 17 61 004 2102 |  |
| Connector<br>with same sized contacts | 4 | 2.8 | 17 61 004 2103 |  |
| Connector<br>with leading/lagging contacts<br>OBSAI configuration | 4 | 2.8 | 17 61 004 2101 |  |
| Connector<br>with leading contact | 4 | 2.8 | 17 61 004 2104 |  |

### Contact dimensions [mm]

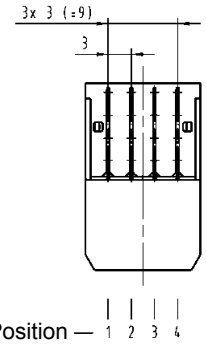



### Connector dimensions [mm]

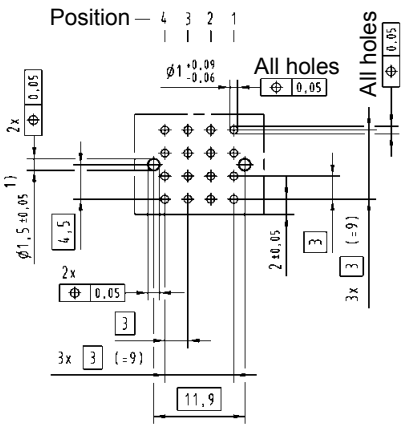



(View magnified)




### Board drillings




[1] Non-metallized drillings
[2] Type XL on request
Tooling see chapter 20



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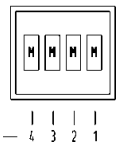
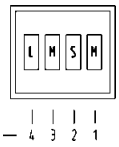
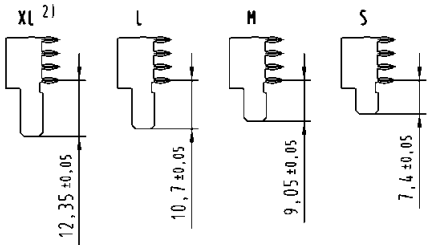
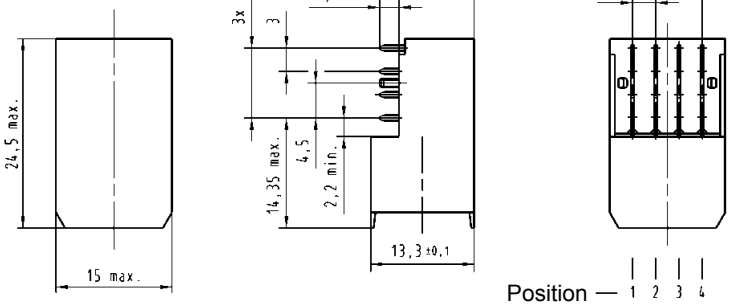
## Male connectors angled, with solder (SMC) termination

| Identification | No. of contacts | Contact length [mm] termination side | Part number | Contact loading |
|---|---|---|---|---|
| Connector<br>with same sized contacts | 4 | 2.5 | 17 61 004 2802 |  |
| Connector<br>with leading/lagging contacts<br>OBSAI configuration | 4 | 2.5 | 17 61 004 2801 |  |

### Contact dimensions [mm]

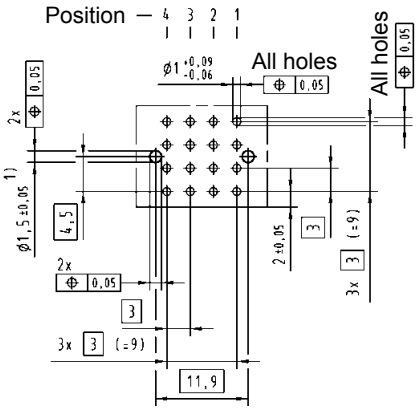



### Connector dimensions [mm]




(View magnified)

### Board drillings







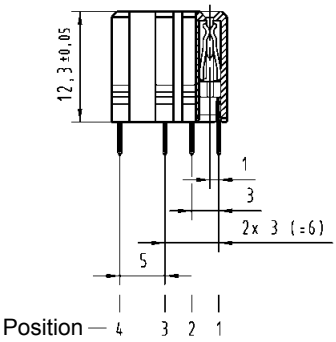

1) Non-metallized drillings
2) Type XL on request

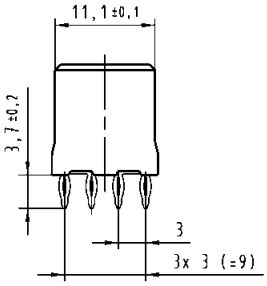
Downloaded from Arrow.com.

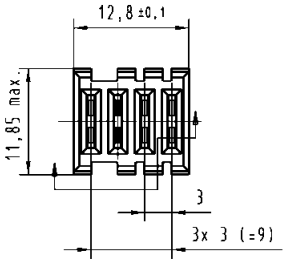
## Female connector straight, with press-in termination

| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| Connector<br>with same sized contacts | 4 | 3.7 | 17 66 004 2201 |

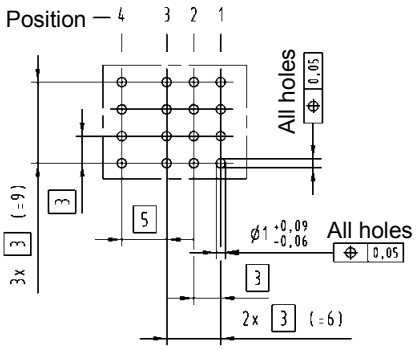
### Connector dimensions [mm]




### Board drillings



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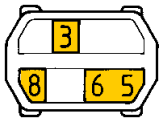
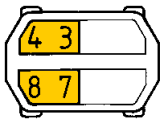
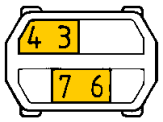
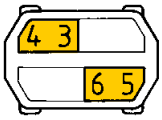
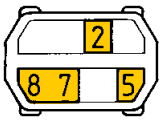
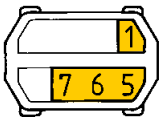
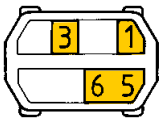
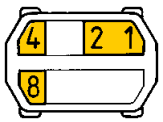
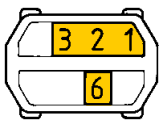
Coding keys are used to prevent mismating of boards. They can be inserted into the multifunctional area of male and female connectors with special tooling. This can be easily done after the connectors have been pressed in.

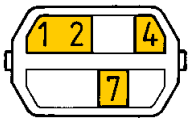
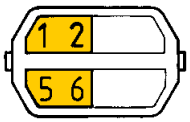
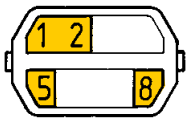
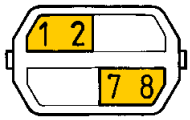
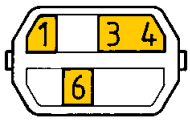
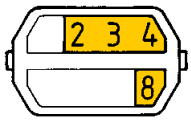
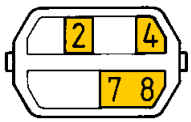
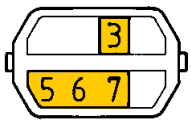
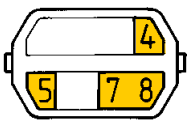
Coding keys have different bright and pre-defined RAL colours to simplify the identification. In the table below the colours and code numbers in acc. with the IEC 61076-4-101 are listed. They are used for the following applications:

- Cadmium yellow for CompactPCI to identify 3.3 V bus signalling
- Brilliant blue for CompactPCI to identify 5.0 V bus signalling
- Reseda green to prevent accidental board insertion in VME64x on CompactPCI applications
- Strawberry red to prevent accidental board insertion in telephony applications
- Pastel orange for user defined bus
- Nut brown for rear I/O and user I/O

Coding keys for male connectors

| Coding key | Code number | Colour | Part number |
|---|---|---|---|
|  | 3568 | Pastel orange RAL 2003 | 17 79 000 0010 |
|  | 3478 | Steel blue RAL 5011 | 17 79 000 0011 |
|  | 3467 | Slate grey RAL 7015 | 17 79 000 0012 |
|  | 3456 | Cadmium yellow RAL 1021 for CPCI, 3.3 V | 17 79 000 0013 |
|  | 2578 | Reseda green Ral 6011 | 17 79 000 0014 |
|  | 1567 | Brilliant blue RAL 5007 for CPCI, 5.0 V | 17 79 000 0015 |
|  | 1356 | Blue lilac RAL 4005 | 17 79 000 0016 |
|  | 1248 | Strawberry red RAL 3018 | 17 79 000 0018 |
|  | 1236 | Nut brown RAL 8011 | 17 79 000 0019 |

Coding keys for female connectors

| Coding key | Code number | Colour | Part number |
|---|---|---|---|
|  | 1247 | Pastel orange RAL 2003 | 17 79 000 0020 |
|  | 1256 | Steel blue RAL 5011 | 17 79 000 0021 |
|  | 1258 | Slate grey RAL 7015 | 17 79 000 0022 |
|  | 1278 | Cadmium yellow RAL 1021 for CPCI, 3.3 V | 17 79 000 0023 |
|  | 1346 | Reseda green Ral 6011 | 17 79 000 0024 |
|  | 2348 | Brilliant blue RAL 5007 for CPCI, 5.0 V | 17 79 000 0025 |
|  | 2478 | Blue lilac RAL 4005 | 17 79 000 0026 |
|  | 3567 | Strawberry red RAL 3018 | 17 79 000 0028 |
|  | 4578 | Nut brown RAL 8011 | 17 79 000 0029 |

All codings are in acc. with the IEC 61076-4-101 specification





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HARTING's har:bus® HM shrouds protect the pins protruding the rear side of the backplane from irregular mating tolerances, thus ensuring a quality connection.

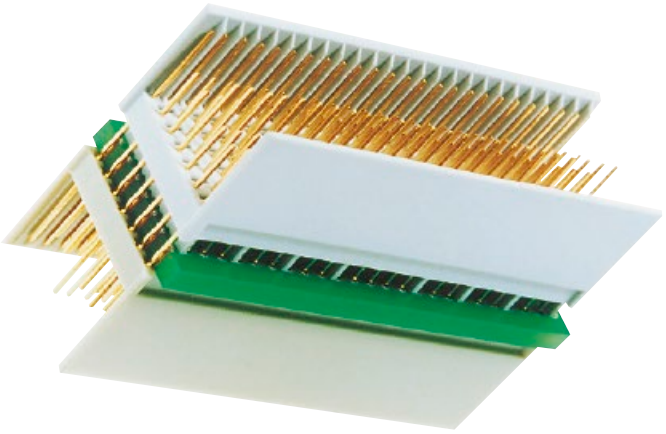
To accommodate pcb thickness, from 1.6 up to 4 mm nominal, the shrouds have integrated standoffs of corresponding height.

Thus forming a one piece solution that reduces assembling cost significantly.

The shroud can be mounted without the additional requirement of spacers to ensure the desired pin lengths on the rear side of the pcb.

Fixing of the component is carried out on the rear post via a smooth friction fit process.

For ease of assembly the same tooling as for the press-in connectors on the front side is utilised for assembly.







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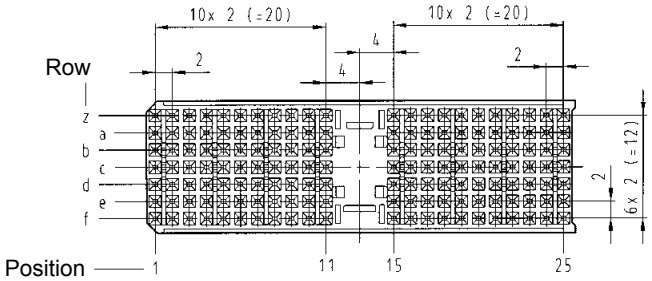
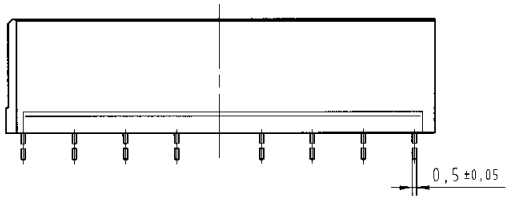
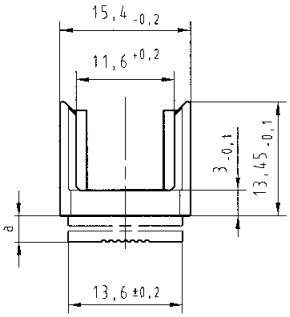
# Shrouds type A

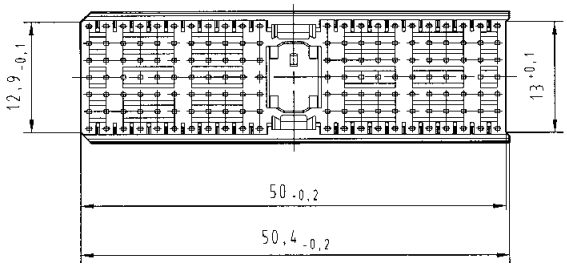
| Identification | Board thickness [mm] | Part number |
|---|---|---|
| Type A shroud<br>25 positions | 1.6 ± 0.4<br>2.4 ± 0.4<br>3.2 ± 0.4<br>4.0 ± 0.4 | 17 70 000 1001<br>17 70 000 1002<br>17 70 000 1003<br>17 70 000 1004 |

## Dimensions




| Board thickness [mm] | a [mm] |
|---|---|
| 1.6 ± 0.4 | 3.1 ± 0.05 |
| 2.4 ± 0.4 | 2.3 ± 0.05 |
| 3.2 ± 0.4 | 1.5 ± 0.05 |
| 4.0 ± 0.4 | 0.7 ± 0.05 |

Dimensions [mm]





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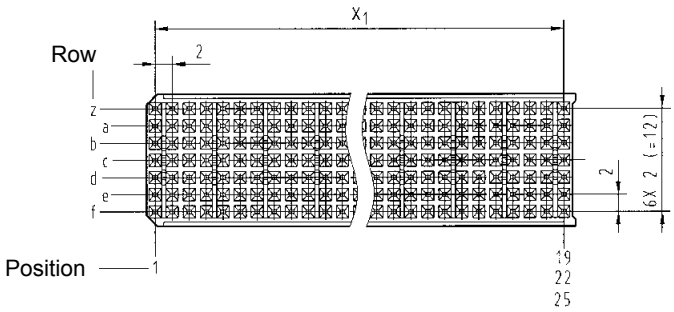
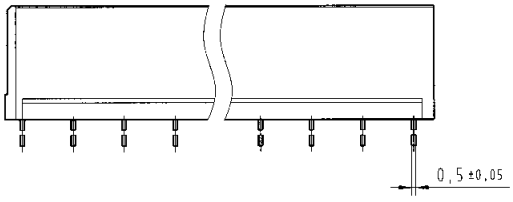
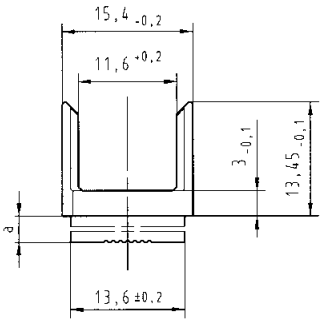
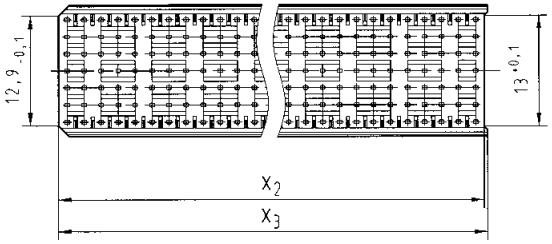
| Identification | Board thickness [mm] | Part number |
|---|---|---|
| Type B shroud<br>25 positions | 1.6 ± 0.4<br>2.4 ± 0.4<br>3.2 ± 0.4<br>4.0 ± 0.4 | 17 70 000 2001<br>17 70 000 2002<br>17 70 000 2003<br>17 70 000 2004 |
| 22 positions | 1.6 ± 0.4<br>2.4 ± 0.4<br>3.2 ± 0.4<br>4.0 ± 0.4 | 17 70 000 4001<br>17 70 000 4002<br>17 70 000 4003<br>17 70 000 4004 |
| 19 positions | 1.6 ± 0.4<br>2.4 ± 0.4<br>3.2 ± 0.4<br>4.0 ± 0.4 | 17 70 000 5001<br>17 70 000 5002<br>17 70 000 5003<br>17 70 000 5004 |

## Dimensions




| Board thickness [mm] | a [mm] |
|---|---|
| 1.6 ± 0.4 | 3.1 ± 0.05 |
| 2.4 ± 0.4 | 2.3 ± 0.05 |
| 3.2 ± 0.4 | 1.5 ± 0.05 |
| 4.0 ± 0.4 | 0.7 ± 0.05 |

| Contact positions | $x_1$ [mm] | $x_2$ [mm] | $x_3$ [mm] |
|---|---|---|---|
| 19 | 18 x 2 (= 36) | 38 – 0.2 | 38.4 – 0.2 |
| 22 | 21 x 2 (= 42) | 44 – 0.2 | 44.4 – 0.2 |
| 25 | 24 x 2 (= 48) | 50 – 0.2 | 50.4 – 0.2 |

Dimensions [mm]



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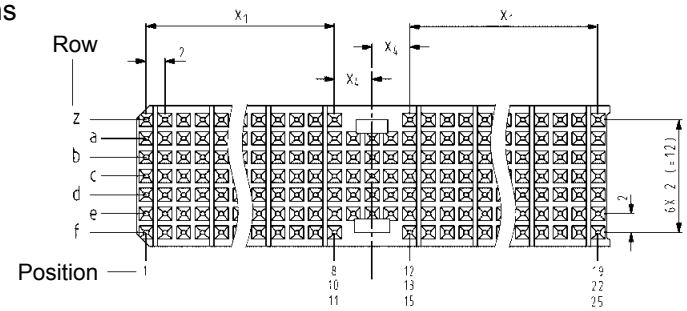
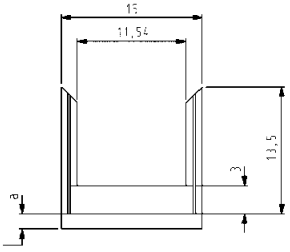
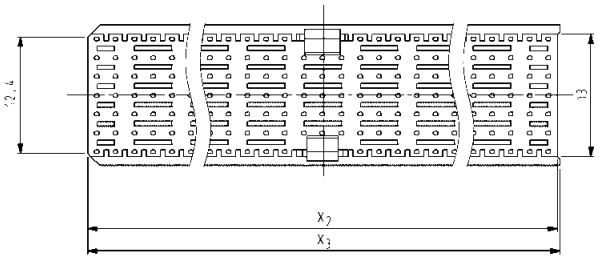
| Identification | Board thickness [mm] | Part number |
|---|---|---|
| Type AB shroud<br>25 positions | 1.6 ± 0.4<br>2.4 ± 0.4<br>3.2 ± 0.4<br>4.0 ± 0.4 | 17 70 000 8001<br>17 70 000 8002<br>17 70 000 8003<br>17 70 000 8004 |
| 22 positions | 1.6 ± 0.4<br>2.4 ± 0.4<br>3.2 ± 0.4<br>4.0 ± 0.4 | 17 70 000 7001<br>17 70 000 7002<br>17 70 000 7003<br>17 70 000 7004 |
| 19 positions | 1.6 ± 0.4<br>2.4 ± 0.4<br>3.2 ± 0.4<br>4.0 ± 0.4 | 17 70 000 6001<br>17 70 000 6002<br>17 70 000 6003<br>17 70 000 6004 |

## Dimensions




| Board thickness [mm] | a [mm] |
|---|---|
| 1.6 ± 0.4 | 3.1 ± 0.05 |
| 2.4 ± 0.4 | 2.3 ± 0.05 |
| 3.2 ± 0.4 | 1.5 ± 0.05 |
| 4.0 ± 0.4 | 0.7 ± 0.05 |

| Contact positions | $x_1$ [mm] | $x_2$ [mm] | $x_3$ [mm] | $x_4$ [mm] |
|---|---|---|---|---|
| 19 | 7 x 2 (= 14) | 37.9 | 38.2 | 4 |
| 22 | 8 x 2 (= 16) | 43.9 | 44.2 | 3 |
| 25 | 10 x 2 (= 20) | 49.9 | 50.2 | 4 |

Dimensions [mm]





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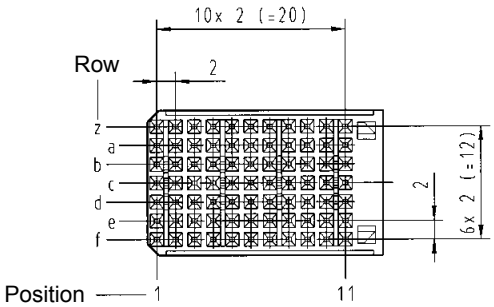
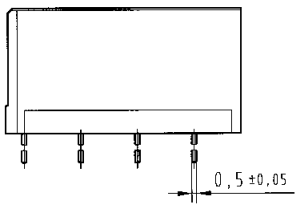
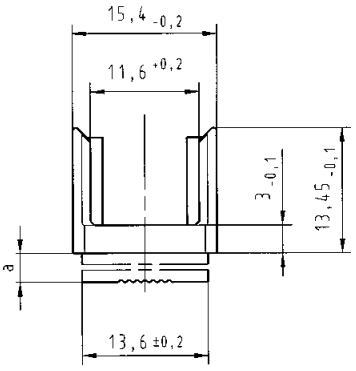
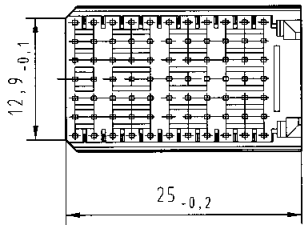
| Identification | Board thickness [mm] | Part number |
|---|---|---|
| Type C shroud<br>11 positions | 1.6 ± 0.4<br>2.4 ± 0.4<br>3.2 ± 0.4<br>4.0 ± 0.4 | 17 70 000 3001<br>17 70 000 3002<br>17 70 000 3003<br>17 70 000 3004 |

## Dimensions



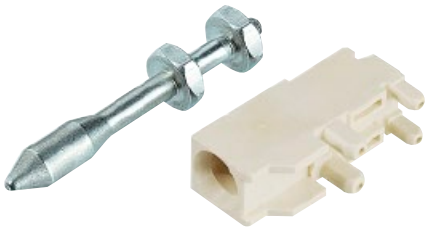




| Board thickness [mm] | a [mm] |
|---|---|
| 1.6 ± 0.4 | 3.1 ± 0.05 |
| 2.4 ± 0.4 | 2.3 ± 0.05 |
| 3.2 ± 0.4 | 1.5 ± 0.05 |
| 4.0 ± 0.4 | 0.7 ± 0.05 |

Dimensions [mm]



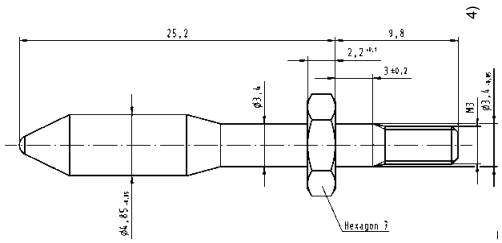
Downloaded from Arrow.com.



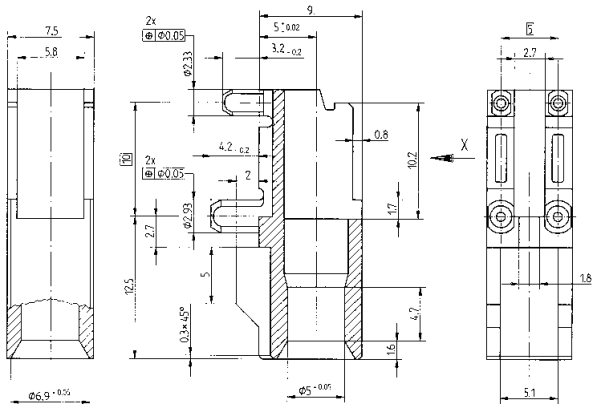
| Identification | Part number |
|---|---|
| Guide pin | 17 79 000 0080 |
| Receptacle for guide pin | 07 73 000 0280 |

Dimensions [mm]

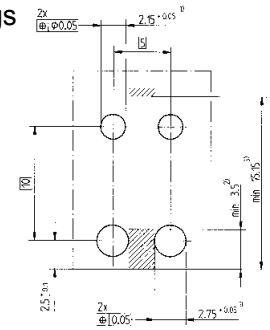
Guide pin




Receptacle for guide pin




Board drillings (View-X)




1) Non-metallised drillings
2) No tracks, except solder eyes
3) Limit area of components (valid for both pcb sides)
4) Recommended board drilling is 3.5 (-0.05) mm

***General information***

The guide pin solution from HARTING allows safe mating under sometimes extreme conditions. This might be large and heavy boards that bow under their own weight. Also insufficiently aligned or worn out rack systems can be tolerated better with the use of HARTING's guiding system, which also reduces the potential danger of damaging cards when being forced into flexing racks.

The guide pin and receptacle's design solution allows to overcome a 3 mm [.118'] offset between the backplane and the mating daughtercard. The reducing diameter of the pin (from 4.85 mm to 3.4 mm) ensures that its positioning task is smoothly transferred to the connectors as soon as they start to engage. Finally the thin diameter section of the guide pin is no longer positioned by the ferrule of the receptacle, ensuring that the pin is able to freely follow any movement imposed by the engaging connector. This ensures that there is no static stress between the connectors and the guiding system.

The rugged metal designed guide pin is screwed to the backplane with standard hexagon screws. Whereas the molded receptacle is designed with four press-in pegs that can be installed to the board together with the connectors.

The tooling can be ordered with the part numbers **07 79 000 0157** (top tool) and **07 79 000 0158** (bottom tool).

Recommended accessories: hexagon nut ISO 4032-M3-8
serrated lock washer DIN 6798-A-3.2 FSt





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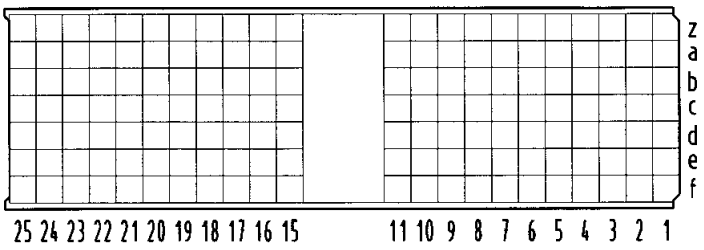
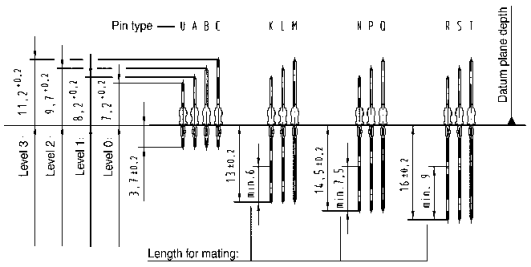
# HARTING customer request form*

Should you need a specially loaded connector for your application, please use this request form. Fill out the drawing for the desired connector style and mark each position with the required contact length (A, B, …, S, T).

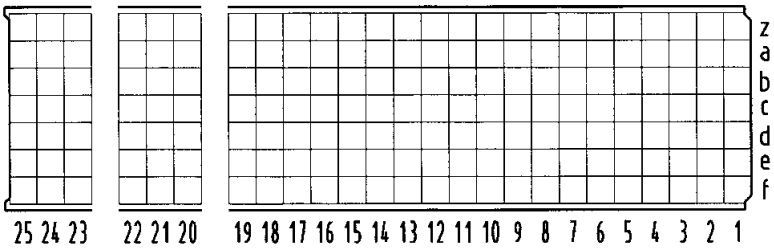
## Type A



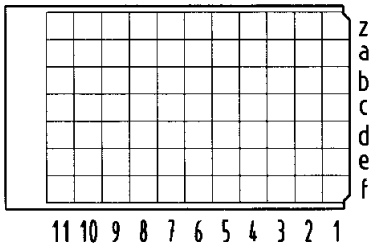

## Contact dimensions [mm]



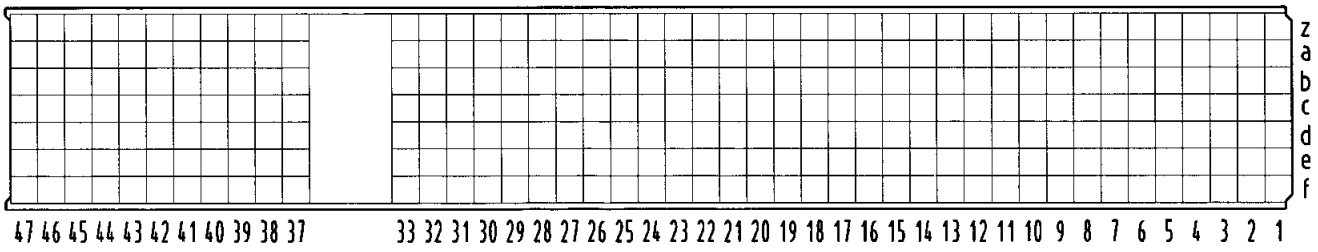

## Type B (19, 22 or 25 positions)




## Type C




## Type Monoblock 47




Name: _____

Company: _____

Address: _____

_____

Phone: _____

Fax: _____

E-Mail: _____

Performance level: ☐ 1 ☐ 2

Drawing: ☐ yes ☐ no

Samples: ☐ no ☐ yes, quantity

Volume (pcs./year): _____

Special requirements: _____



* For AB types see page 11.49
For D, E and DE types see page 11.50

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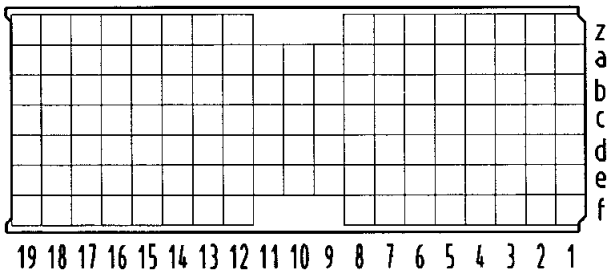
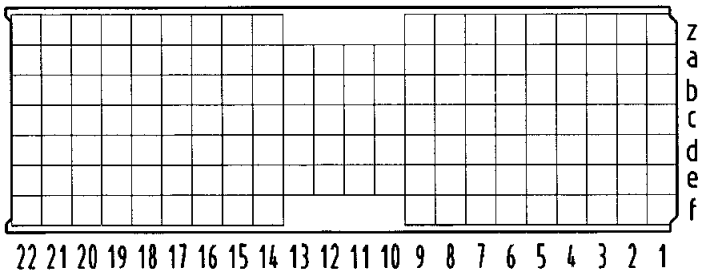
# HARTING customer request form

Should you need a specially loaded connector for your application, please use this request form. Fill out the drawing for the desired connector style and mark each position with the required contact length (A, B, …, S, T).

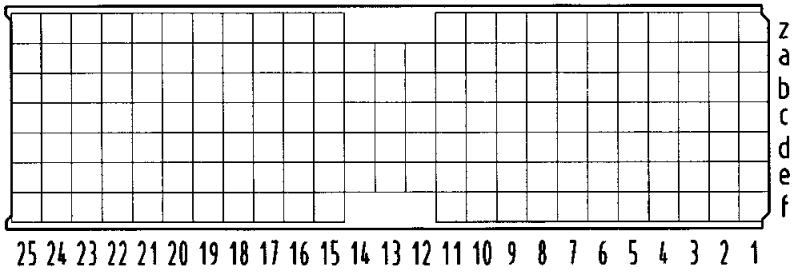
## Type AB (19 positions)



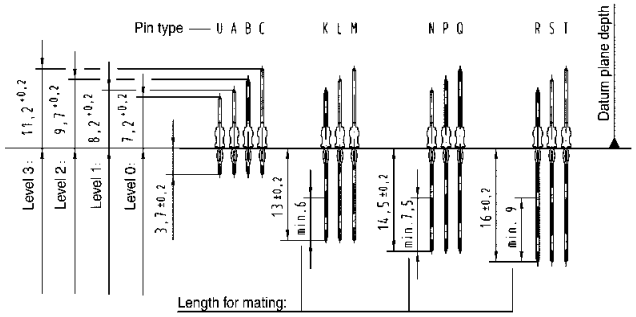

## Type AB (22 positions)




## Type AB (25 positions)




## Contact dimensions [mm]




Name: _____

Company: _____

Address: _____

_____

Phone: _____

Fax: _____

E-Mail: _____

Performance level: ☐ 1 ☐ 2

Drawing: ☐ yes ☐ no

Samples: ☐ no ☐ yes, quantity

Volume (pcs./year): _____

Special requirements: _____





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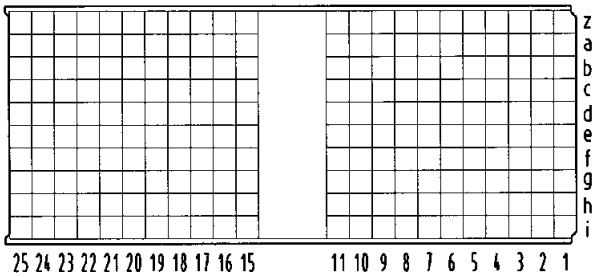
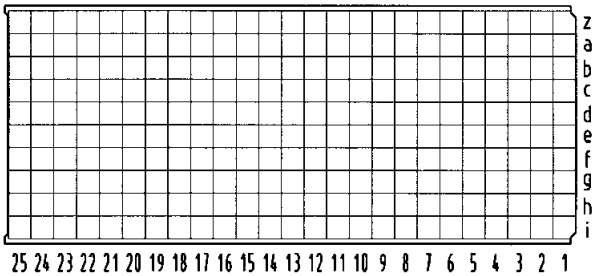
# HARTING customer request form

Should you need a specially loaded connector for your application, please use this request form. Fill out the drawing for the desired connector style and mark each position with the required contact length (A, B, …, S, T).

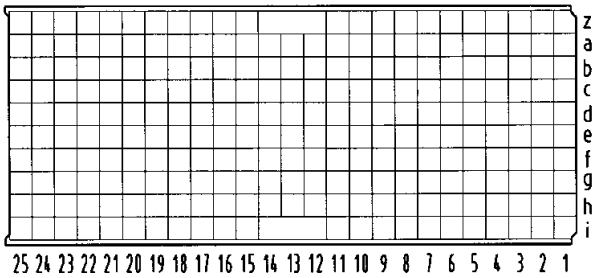
## Type D



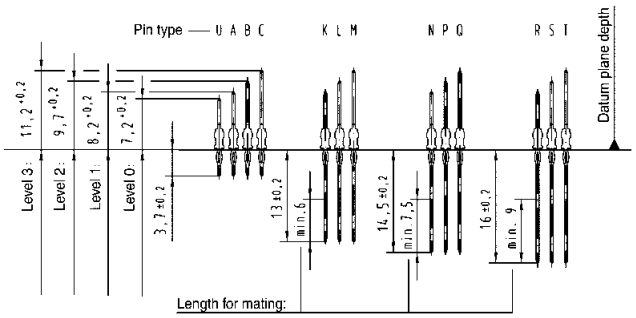

## Type E




## Type DE




## Contact dimensions [mm]




Name: _____

Company: _____

Address: _____

_____

Phone: _____

Fax: _____

E-Mail: _____

Performance level: ☐ 1 ☐ 2

Drawing: ☐ yes ☐ no

Samples: ☐ no ☐ yes, quantity

Volume (pcs./year): _____

Special requirements: _____



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# Notes





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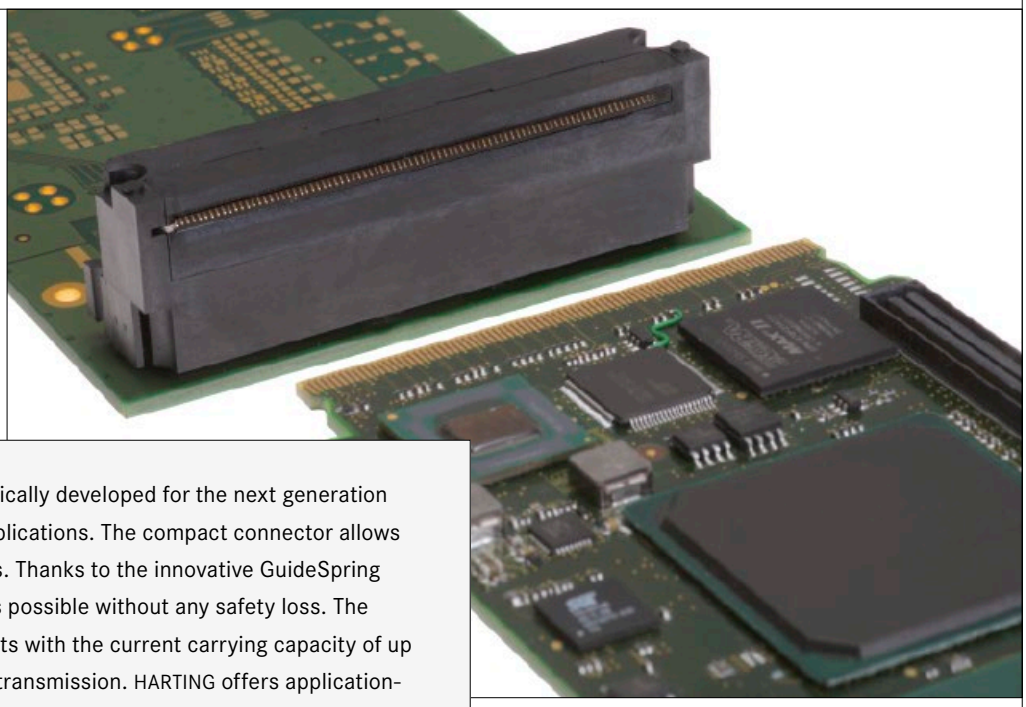
# 12. TCA Connectors



The TCA connectors have been specifically developed for the next generation of telecom, medical and industrial applications. The compact connector allows the transmission of highest data rates. Thanks to the innovative GuideSpring concept, the direct plug-in of a PCB is possible without any safety loss. The power connector offers power contacts with the current carrying capacity of up to 16 A as well as contacts for signal transmission. HARTING offers application-specific design-in support for the connectors, as well as the system analysis support.

*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| ● | | ● | | ● | ● | ● | ● | | ● | ● |

**Cable termination**

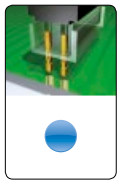
*Han-Quick Lock®* | *IDC* | *Crimp*

*Screw* | *Cage clamp* | *Axial screw*

**PCB termination**

*THT* | *SMC* | *SMT*

*Press-in*

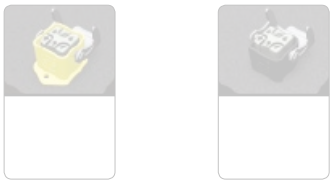


**Application standard**

PICMG® AdvancedTCA® AdvancedMC™ µTCA™

**Housing integration**

*Separate housing* | *Integrated housing*



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| Power connectors for AdvancedTCA® | **12.10** |
| AdvancedMC™ connectors for MicroTCA™ | **12.12** |
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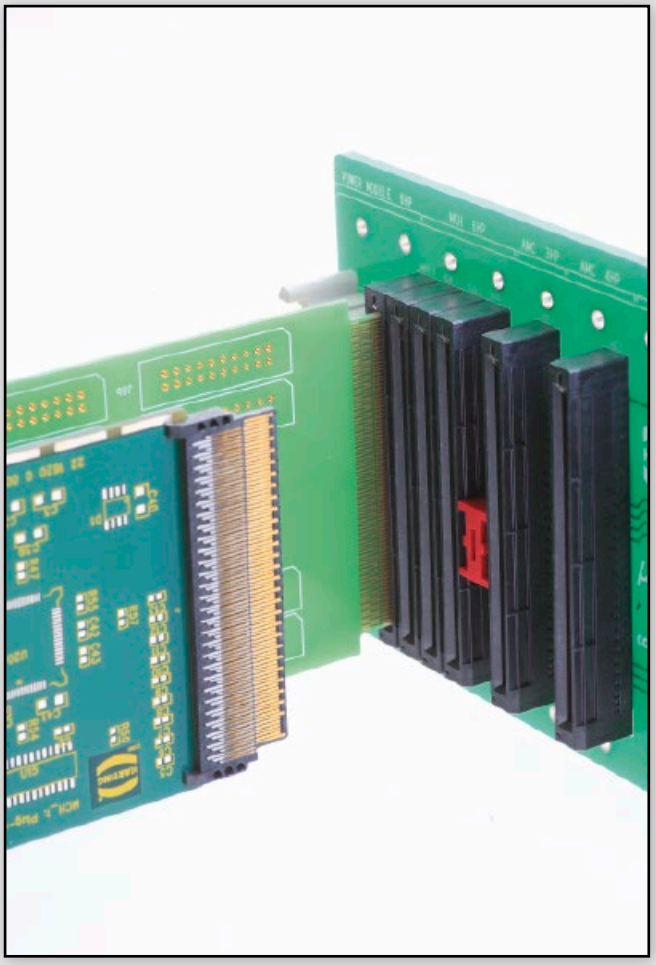
## CONNECTORS FOR TCA

The TCA connectors have been developed for the open hardware standards AdvancedTCA®, AdvancedMC™ and MicroTCA™.
They are specified by the PCI Industrial Computer Manufacturers Group (PICMG), a consortium of more than 450 product suppliers. These innovative systems are finding increasing use for industrial control systems and computer systems.
HARTING is an active member of the PICMG and participated in the standardization process of the connectors for these systems. HARTING offers several connectors for signal and power transmission.
With the new "**con:**card**+**" connectors with press-in termination, HARTING has substantially improved the contact reliability of the AdvancedMC™ connector for MicroTCA™ and AdvancedTCA®. The key element of the new "**con:**card**+**" connector is the integrated GuideSpring, which is able to compensate any tolerance deviations of the AdvancedMC™ printed circuit boards by centrally positioning the circuit board within the connector slot. The GuideSpring allows HARTING to ensure the reliable connection of the circuit boards, which can be manufactured in large-scale production today.
Other advantages of the "**con:**card**+**" technology are the extremely smooth contact surface and a robust contact coating which allows the specified 200 mating cycles between the daughter card and the card edge connector.



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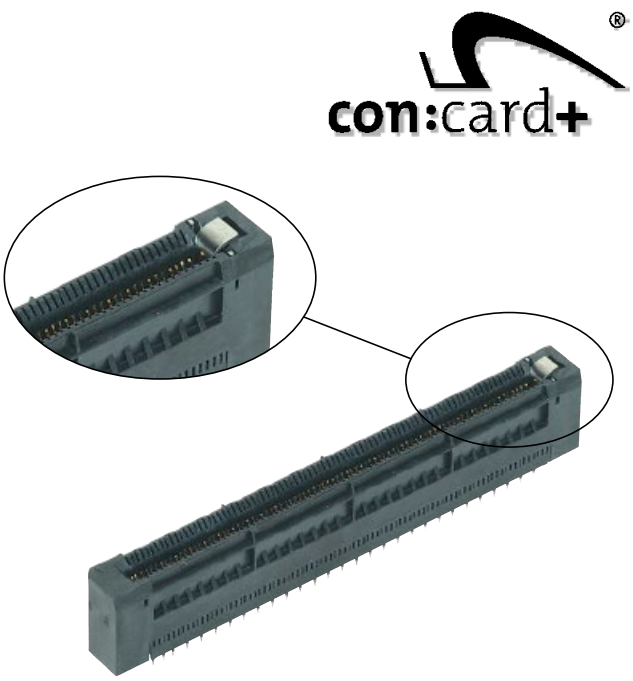
### HIGH CONTACT RELIABILITY

The “**con:**card**+**” technology offers highest contact reliability as required for industry applications.




### INTERNATIONAL STANDARD

The TCA connectors meet the requirements of the PICMG (PCI Industrial Computers Manufacturers Group) specifications AdvancedMC™, Advanced TCA® and MicroTCA™ and can be used for these applications.

PICMG®

AdvancedTCA®

AdvancedMC™

µTCA™





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PICMG, formally known as the PCI Industrial Computing Manufacturing Group – is an industry consortium of over 450 companies. PICMG's purpose is to define standard architectures in an effort to reduce system costs and development cycles and since its 1994 foundation, PICMG has been responsible for the establishment of several of successfully implemented, open, industrial standards. Open standards have proven themselves to be very advantageous for system manufacturers and end-user, because they create multiple vendors of similar parts, low prices at high volumes, and a shortened time-to-market.

Historically, PICMG has created several successful standards.

- PICMG 1.x Series – a passive backplane PCI specification
- PICMG 2.x Series – the CompactPCI® standard

## AdvancedTCA®

Today, the AdvancedTCA® series of specifications (PICMG 3.x) targets the requirements of the next generation of carrier grade telecommunications equipment. AdvancedTCA®, short for Advanced Telecom Computing Architecture and sometimes simply abbreviated ATCA®, incorporates an impressive suite of recent technological advancements including the latest trends in high speed interconnect technologies.

Features of AdvancedTCA® include optimization for high-capacity, high-performance telecom and industrial applications, improved reliability, manageability, redundability, and serviceability. Encompassing a technological growth path valid for up to ten years, AdvancedTCA® has earned a solid position within the telecom systems market.

AdvancedTCA® chassis with backplane

The rack or chassis, is responsible for housing the backplane and the daughtercards, as well as cooling and powering the system. HARTING offers the ATCA® power connector that energises the blades, both the straight backplane and the right angled daughtercard connector.

The backplane, said to be passive, is merely a medium for the daughtercards to communicate with each other. And, the daughtercards, sometimes called blades or boards, provide the system with its functionality and allow for an easy, hot-swappable module exchange from the front of the system.

Initially, many blades were designed with a fixed functionality, and they had to be replaced once their functionality became obsolete or the demands of the system changed. With the continuation of exponential technological growth, concept proved to be a costly endeavour for the end-user.

## AdvancedMC™

To extend the functionality and modularity of AdvancedTCA®, blade manufacturers conceived the idea of upgradeable daughtercards, and began to insert mezzanine cards onto the blades when needed. To achieve a common mezzanine concept, PICMG developed the Advanced Mezzanine Card (AdvancedMC™) standard AMC.0.

AdvancedMC™ modules for different applications

For the use of Advanced Mezzanine Cards, as well called AdvancedMC™ modules, a carrier is necessary. A carrier is an ATCA® blade with only little functionality beyond AdvancedMC™ management. It contains the mechanical environment for the AdvancedMC™ modules. Depending on their size, up to eight AdvancedMC™ modules can be hot-swapped in and out of a carrier, this enabled the





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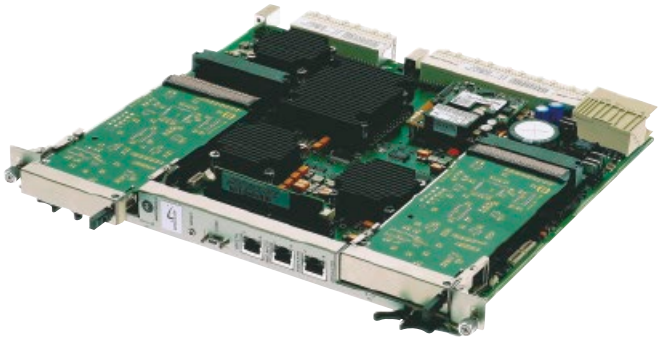


AdvancedTCA® carrier board with AdvancedMC™ modules

creation of extremely scalable and upgradeable systems.

To connect AdvancedMC™ modules to carrier boards PICMG defined a new high-speed mezzanine connector: the AdvancedMC™ connector – a card edge connector mounted on the carrier board. It contacts directly with the module's PCB gold pads. Although PICMG defined four AdvancedMC™ connector types (B, B+, AB and A+B+), current market developments focus on type B+.

The HARTING AdvancedMC™ B+ connector features a new design element that supplements the standard – the GuideSpring. The GuideSpring significantly increases the mating reliability and prevents contact interruptions and surface wear when subjected to shocks or vibrations.

The press-fit termination technology provides significant cost and durability advantages over other termination technologies. The connector design allows for the use of a standard flat rock die. For more press-in process control, HARTING offers a special top and bottom tool.

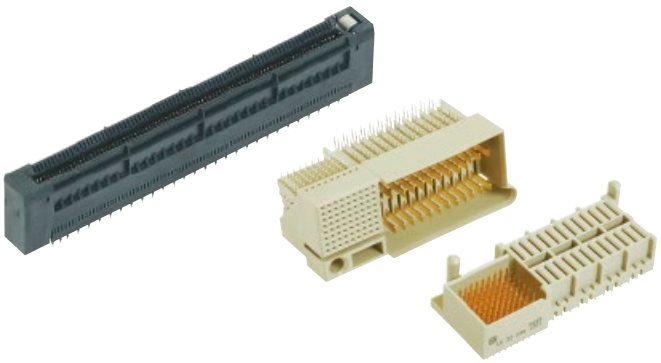
## µTCA™

This revolutionary AdvancedMC™-based design concept has led to the recent development of a completely mezzanine-based system – MicroTCA™. MicroTCA™, short for Micro Telecom Computing Architecture, is a more cost-efficient platform than AdvancedTCA® when dealing with smaller applications, yet powerful enough to address the needs of telecom, enterprise and medical applications.

This newly-implemented PICMG standard, outlined in the MTCA.0 specification, presents a design-concept whereby AdvancedMC™s – the same kind used in ATCA® systems – plug directly into a passive backplane; this eliminates the need for carrier boards.

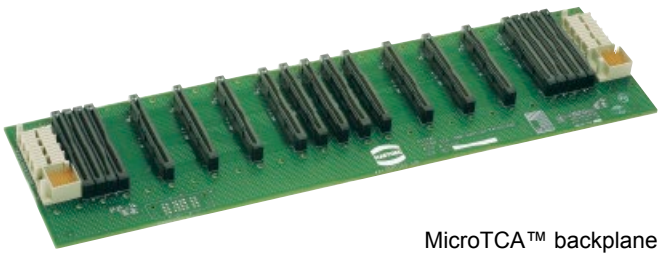
MicroTCA™ double cube system

Naturally the mating face of the AdvancedMC™ connector for MicroTCA™ is the same as for ATCA®, but with a right angled mating direction. It contains the new GuideSpring and is available in press-in termination. PICMG members voted HARTING's MicroTCA™ connector footprint as the new MicroTCA™ standard connector for press-fit termination technology.



AdvancedMC™ and power connectors for MicroTCA™

The MicroTCA™ backplane is typically powered by special, field replaceable, hot-swapable, redundant Power Supply Units (PSU). The PSU connects to the backplane through a MicroTCA™ power connector (press-fit termination) also available from HARTING.



MicroTCA™ backplane

The module management is performed by a MicroTCA™ Carrier Hub, or MCH. An MCH is connected to the backplane by up to four adjacent card-edge connectors. One MCH can control up to 12 AdvancedMC™ modules, thus depending on redundancy requirements, workload, or both, one or two MCHs may be used within a single system.





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## What is con:card+?

**con:**card**+** is a quality seal for AdvancedMC™ connectors that helps to deliver a significant increase in the reliability of MicroTCA™ and AdvancedTCA® systems. In order to reach the target availability of 99.999 %, all system components must be carefully coordinated, and they must function reliably. The selection of suitable connectors is an essential, decisive factor here, as today it is virtually impossible for series production to meet the strict tolerances for the AdvancedMC™ modules as defined in the respective specifications. The so-called GuideSpring is ideally suited for compensating here, and represents just one of a total of five key advantages of the **con:**card**+** philosophy. All the advantages are introduced in the following. Please find further information also on the internet at www.concardplus.com.

## Special contact design

*Unlike conventional mating systems with male and female connectors, the AdvancedMC™ has only one, not two, contact tongues per contact. In order to ensure a permanently reliable contact, this single contact tongue must press against the gold pad with sufficient force throughout the entire lifetime. In addition, the thickness of the AdvancedMC™ modules may fluctuate by ±10 %. To meet this challenge, HARTING utilizes a special contact design with very low relaxation for the **con:**card**+** connector.*

## PdNi contact coating

*In order better to meet the high requirements placed on the connectors, a palladium-nickel surface (PdNi) with additional gold flash is used. As a result, wear resistance is increased by roughly 30 %. Even when applied very thinly, PdNi surfaces offer a quality and corrosion-resistant coating that meets the high requirements placed on the connection far better than pure gold.*

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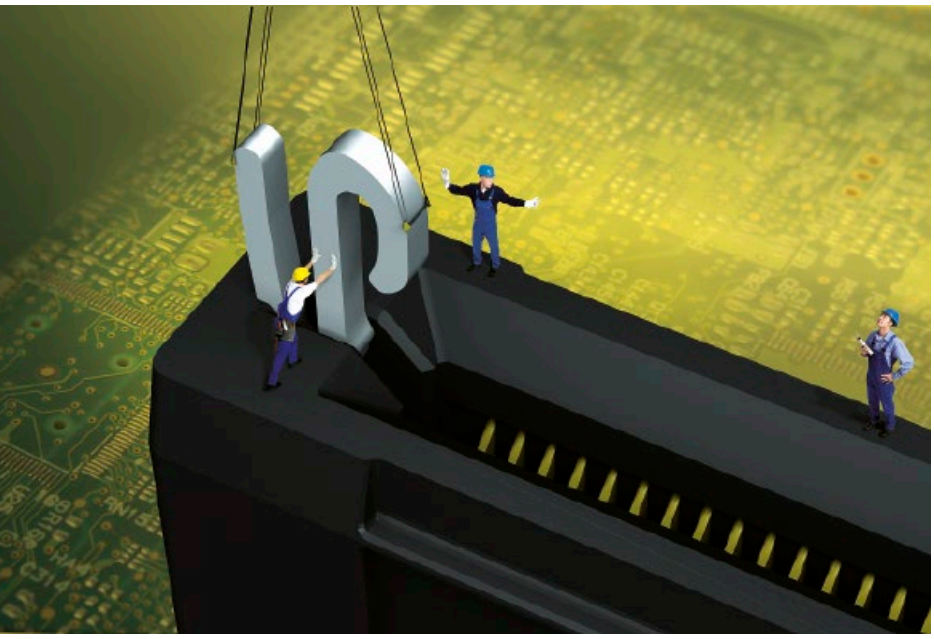
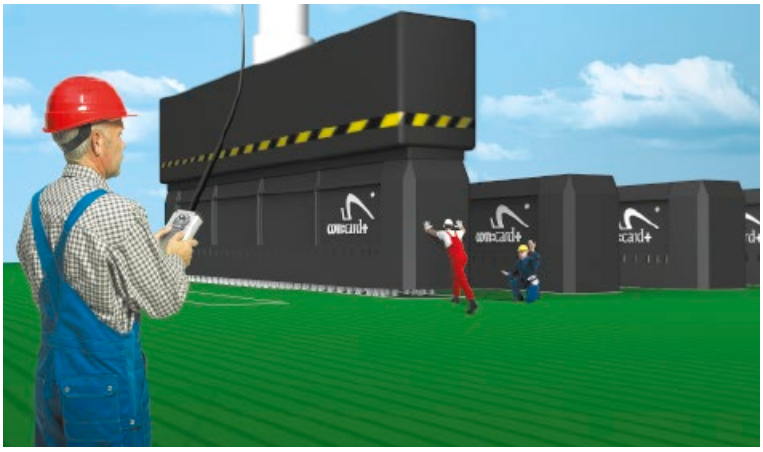
## Smooth contact surface

*The specification for the AdvancedMC™ entails 200 mating cycles for a module. On the PCB, the nickel/hard gold layer on the relatively soft copper can only stand up to this high load if the contact surface is absolutely smooth.*
*This is the case with the* ***con:****card****+*** *connector. With years of experience in stamping techniques and the utilization of high-performance stamping tools with special process components, HARTING is actively involved in minimizing gold pad wear.*



## GuideSpring

*PCB manufacturers are not capable of meeting the AdvancedMC™ modules' tight tolerances with certainty in the series process today. Just a single card with tolerances slightly larger than allowed by the specifications can lead to a system breakdown.*
*The* ***con:****card****+*** *GuideSpring offsets these tolerance deviations by constantly pressing the module against the opposite wall. As this is displaced somewhat towards the middle, the slot is optimally designed for the AdvancedMC™ module, and the mating reliability increases tremendously.*
*In addition, the GuideSpring secures the module position in the case of shocks and vibrations. This prevents loss of contact and surface wear.*



## Press-fit technology

*Press-fit technology results in a gas-tight, corrosion-resistant, low-ohm quality mechanical connection between the pin and the through contacting of the PCB. This remains reliably in contact and stable, even under conditions of high mechanical and thermal loads, such as vibration, bending and frequent temperature changes. This technology represents a tremendous advantage over other processing techniques. Measurements substantiate that the required transmission rates are easily attained.*





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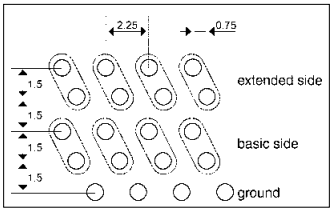
## Technical characteristics

| | |
|---|---|
| Design according | PICMG AMC.0<br>(RoHS compliance) |
| Number of contacts | 170 |
| Contact spacing | 0.75 mm |
| Clearance and creepage distance between contacts | 0.1 mm min. |
| Working current of power contacts as defined in AMC.0 spec. | ~ 2.2 A @ 70 °C<br>max. 30 °C temp. rise<br>(PICMG requirement min. 1.52 A) |
| Test voltage | 80 $V_{r.m.s.}$ |
| Working voltage typically | 3.3 V; 5.0 V; 12.0 V |
| Initial contact resistance | |
| ground contacts | 60 mΩ max. |
| signal, power, general purpose contacts | 90 mΩ max. |
| Initial insulation resistance | 100 MΩ min. |
| Nominal differential impedance | 100 Ω±10 % |

| Max. crosstalk @ 25 ps risetime | Bottom route |
|---|---|
| Adjacent | 0.55 % |
| Basic-to-extended (diagonal) | 0.68 % |
| Basic-to-extended (opposite) | 0.39 % |
| Multiline (five multi-aggressor differential pairs) | 2.74 % max. |




PCB library on request (PADS/Dx-Designer)

SPICE models and S-Parameter on request

| | | |
|---|---|---|
| Differential propagation delay | Basic side: | 125 ps |
| | Extended side: | 145 ps |
| Differential skew | Between basic and extended side: | 20 ps |
| | Within basic and extended side: | ±2 ps |

| | |
|---|---|
| Temperature range | -55 °C … +105 °C |
| Durability as per AMC.0 specification | 200 mating cycles |
| Termination technique | Press-in termination |
| Mating force | 100 N max., typically 65 - 90 N (depending on AdvancedMC™) |
| Withdrawal force | 65 N max., typically 30 - 45 N (depending on AdvancedMC™) |

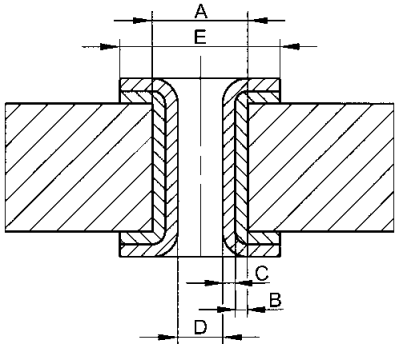
### Materials

| | |
|---|---|
| Moulded parts | Liquid Crystal Polymer (LCP), UL 94-V0 |
| Contacts | Copper Alloy |
| Contact surface | Pd/Ni with Au flash |
| Packaging | Cardboard box (other packaging on request) |

### Recommended plated through hole specification

| | | | |
|---|---|---|---|
| | A | Drill hole-Ø | $0.64^{\pm 0.01}$ mm |
| | B | Cu | 25 - 35 µm |
| Tin plated PCB (HAL) | C | Sn | 5 - 15 µm |
| | D | Hole-Ø | 0.53 - 0.60 mm |
| Au / Ni plated PCB | C | Ni | 3 - 7 µm |
| | | Au | 0.05 - 0.12 µm |
| | D | Hole-Ø | 0.55 - 0.60 mm |
| Chemical tin plated PCB | C | Sn | 0.8 - 1.5 µm |
| | D | Hole-Ø | 0.56 - 0.60 mm |
| OSP copper plated PCB | C | --- | --- |
| | D | Hole-Ø | 0.56 - 0.60 mm |
| | E | Pad size | min. 0.95 mm |

The press-in zone of the AdvancedMC™ connector is tested according to Telcordia/Bellcore GR 1217CORE Part7. It is approved to be used with a plated through hole according IEC 60352-5 with a diameter of $0.55^{\pm 0.05}$ mm (drilled hole $0.64^{\pm 0.01}$ mm).
Based on our experiences regarding the production process of the PCB manufacturer we recommend a plated through hole configuration like shown in the above spreadsheet. To achieve the recommended plated through hole diameter, it is important to specify especially the drilled hole diameter of $0.64^{\pm 0.01}$ mm to your PCB supplier.
For drillings use e.g. drill bit # 72 (0.025" ≈ 0.64 mm).



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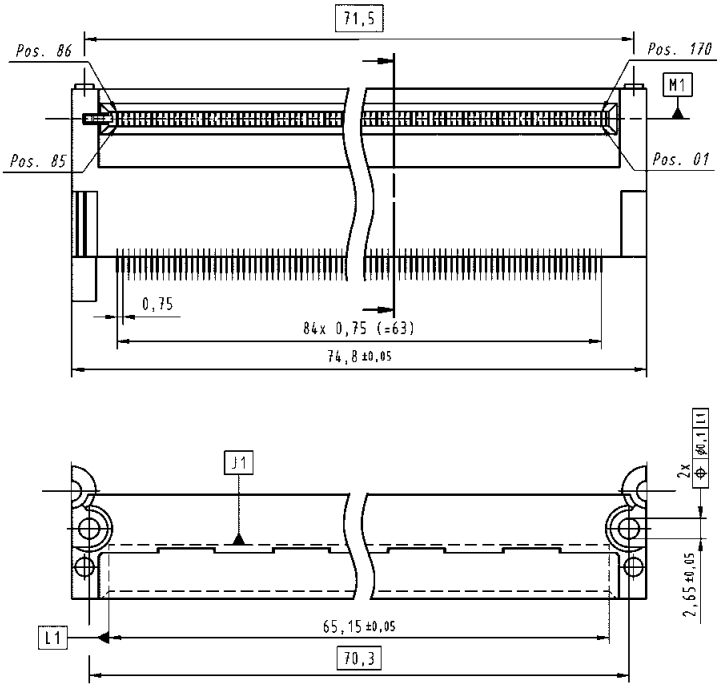
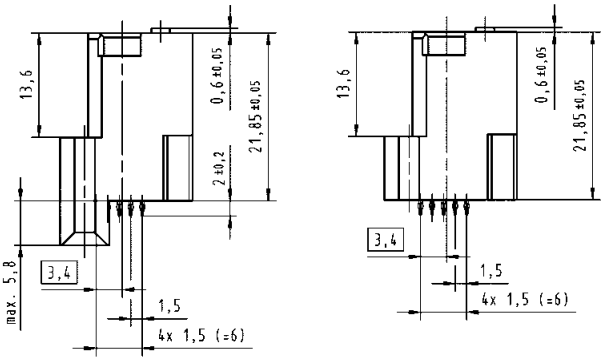
con:card+®

## Card edge connectors, angled

| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| AdvancedMC™ connector for ATCA®, type B+<br>with peg and with GuideSpring | 170 | 2.0 | 16 04 170 5104 000 |
| AdvancedMC™ connector for ATCA®, type B+<br>without peg and with GuideSpring | 170 | 2.0 | 16 04 170 5106 000 |

With peg Without peg With peg Without peg



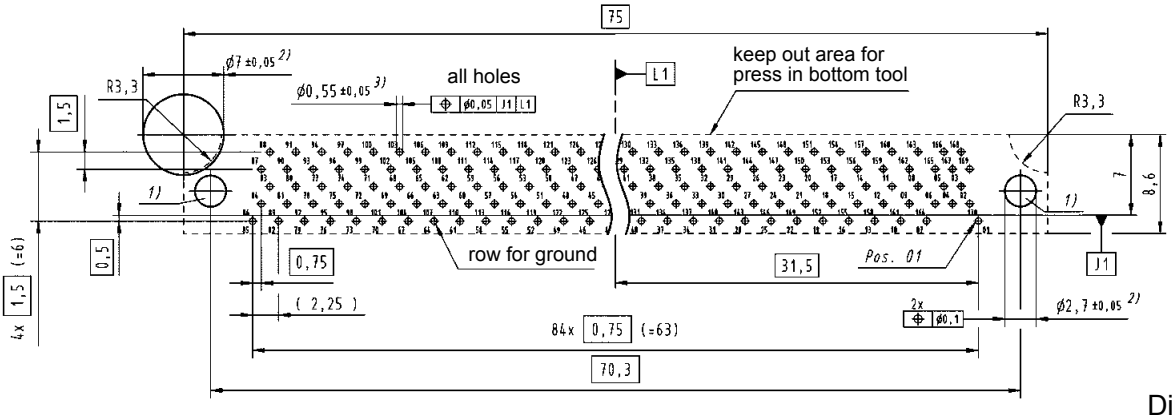




1) fixing-hole optional

2) non-metallized drillings

3) recommended plated through hole specification see page 12.08

Board drillings (view magnified)




Dimensions [mm]





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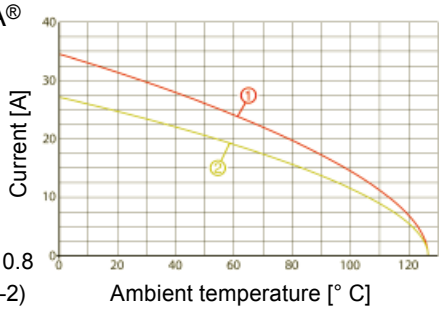
## Technical characteristics

| | |
|---|---|
| Design according | PICMG 3.0 R2.0 |
| Total number of contacts | 30, max. 34 |
| Power contacts | 8 |
| Signal contacts | 22, max. 26 |
| Clearance and creepage distance between contacts | |
| Within group 5–16 | 0.7 mm min. |
| Within group 17–24 | 2.5 mm min. |
| 25 to 26 | 5.5 mm min. |
| Within group 27–34 | 1.4 mm min. |
| 13–16 to 17–20 | 3.0 mm min. |
| 21–24 to 25–26 | 4.0 mm min. |
| 25–26 to 27–29 | 2.0 mm min. |
| Sequential contact engagement | |
| 1st | 25, 26, 28, 29, 30, 31 |
| 2nd | 33 |
| 3rd | 5–24, 34 |
| 4th | 27, 32 |
| Working current | |
| Power contacts | 16 A |
| Signal contacts | 1 A |
| Test voltage | |
| Contacts 1–16 | 1000 $V_{r.m.s.}$ |
| Contacts 17–34 | 2000 $V_{r.m.s.}$ |
| Initial contact resistance | |
| Power contacts | ≤ 2.2 mΩ |
| Signal contacts | ≤ 8.5 mΩ |
| Insulation resistance | ≥ $10^{10}$ Ω |
| Temperature range | -55 °C … +125 °C |
| Durability | 250 mating cycles |
| Termination technique | Press-in termination |
| Mating force | 67 N max. |
| Withdrawal force | 67 N max. |

Derating for ATCA® power contacts

Contact loading acc. PICMG 3.0




① Derating

② Derating @ $I_{max.}$ x 0.8 (acc. IEC 60512-5-2)

**Materials**

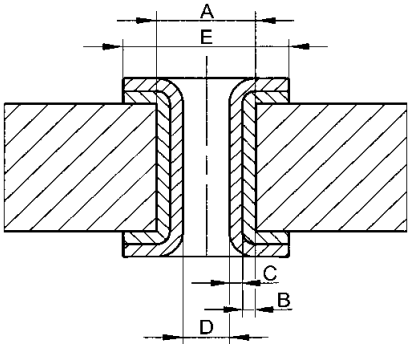
| | |
|---|---|
| Moulded parts | PBT, glass-fibre filled, UL 94-V0 |
| Contacts | Copper Alloy |
| Contact surface | Selectively gold plated |
| Packaging | Cardboard box (other packaging on request) |

**Recommended plated through hole specification**

| | | | Signal contacts | Power contacts |
|---|---|---|---|---|
| | A | Drill hole-Ø | $1.15^{\pm 0.025}$ mm | $1.75^{\pm 0.025}$ mm |
| | B | Cu | 25 - 35 µm | 25 - 35 µm |
| Tin plated PCB (HAL) | C | Sn | 5 - 15 µm | 5 - 15 µm |
| | D | Hole-Ø | 1.00 – 1.10 mm | 1.60 – 1.70 mm |
| Au / Ni plated PCB | C | Ni | 3 - 7 µm | 3 – 7 µm |
| | | Au | 0.05 - 0.12 µm | 0.05 - 0.12 µm |
| | D | Hole-Ø | 1.00 – 1.10 mm | 1.60 – 1.70 mm |
| Chemical tin plated PCB | C | Sn | 0.8 - 1.5 µm | 0.8 - 1.5 µm |
| | D | Hole-Ø | 1.00 – 1.10 mm | 1.60 – 1.70 mm |
| Silver plated PCB | C | Ag | 0.1 - 0.3 µm | 0.1 - 0.3 µm |
| | D | Hole-Ø | 1.00 – 1.10 mm | 1.60 – 1.70 mm |
| OSP copper plated PCB | C | --- | --- | --- |
| | D | Hole-Ø | 1.00 – 1.10 mm | 1.60 – 1.70 mm |
| | E | Pad size | min. 1.4 mm | min. 2.0 mm |

The press-in zone of the AdvancedTCA® power connector is tested according to Telcordia/Bellcore GR 1217CORE Part7. It is approved to be used with a plated through hole according IEC 60352-5 with a diameter of $1.00^{+0.09}_{-0.06}$ mm for signal contacts and $1.60^{+0.09}_{-0.06}$ mm for power contacts (drilled hole $1.15^{\pm 0.025}$ mm resp. $1.75^{\pm 0.025}$ mm).

Based on our experiences regarding the production process of the PCB manufacturer we recommend a plated through hole configuration like shown in the above spreadsheet. To achieve the recommended plated through hole diameter, it is important to specify especially the drilled hole diameter of $1.15^{\pm 0.025}$ mm resp. $1.75^{\pm 0.025}$ mm to your PCB supplier.





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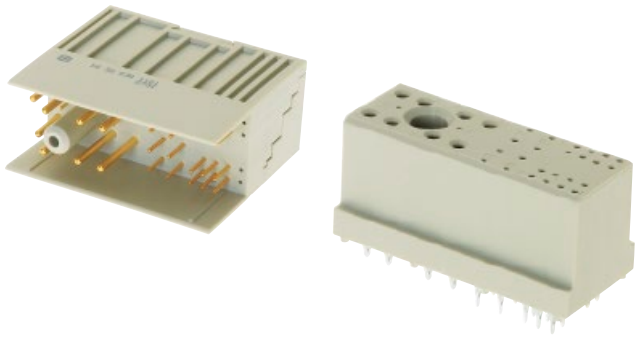
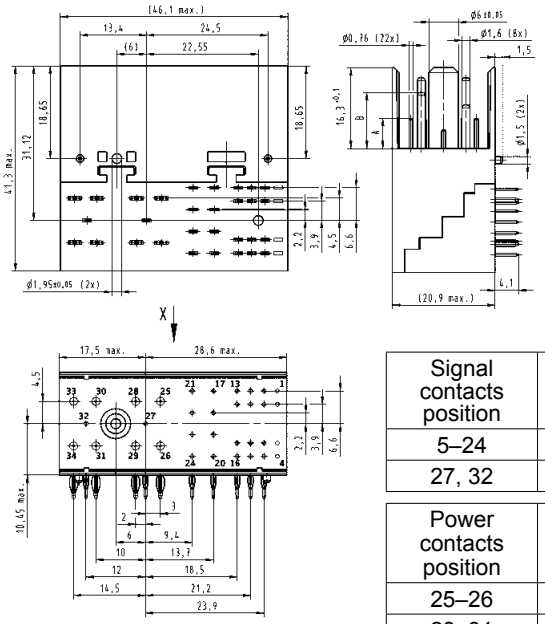
# Power connectors for AdvancedTCA®



| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| Power connector for AdvancedTCA®, male | 30<br>34 | 4.1<br>4.1 | 16 32 030 1101 000<br>16 32 034 1101 000 |
| Power connector for AdvancedTCA®, female | 30<br>34 | 5.3<br>5.3 | 16 31 030 1201 000<br>16 31 034 1201 000 |

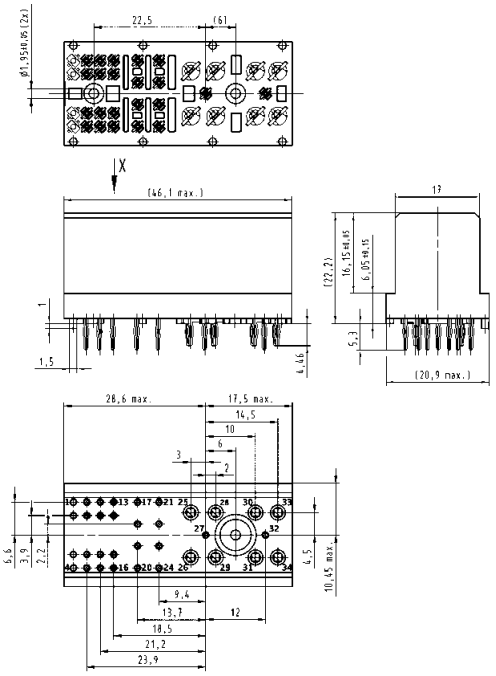
## Male connector with 30 contacts



| Signal contacts position | Dimension A |
|---|---|
| 5–24 | 6.1 |
| 27, 32 | 3.8 |

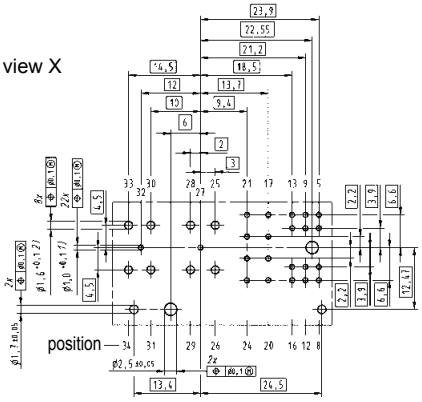
| Power contacts position | Dimension B |
|---|---|
| 25–26 | 14.3 |
| 28–31 | 14.3 |
| 33 | 11.3 |
| 34 | 8.8 |

## Female connector with 30 contacts

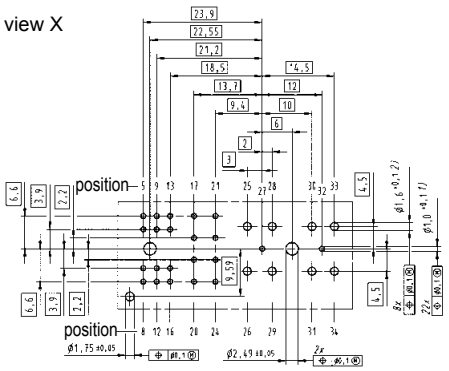


## Board drillings

view X



view X



1) + 2) recommended plated through hole specification
see page 12.10

Dimensions [mm]





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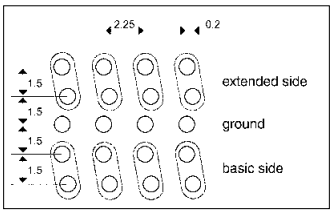
## Technical characteristics

| | |
|---|---|
| Design according | PICMG MTCA.0 R1.0 (RoHS compliance) |
| Number of contacts | 170 |
| Contact spacing | 0.75 mm |
| Clearance and creepage distance between contacts | 0.1 mm min. |
| Working current of power contacts as defined in MTCA.0 spec. | ~ 2.3 A @ 70 °C<br>max. 30 °C temp. rise<br>(PICMG requirement min. 1.52 A) |
| Test voltage | 80 $V_{r.m.s.}$ |
| Working voltage typically | 3.3 V; 5.0 V; 12.0 V |
| Initial contact resistance | 25 mΩ max. |
| Initial insulation resistance | 100 MΩ min. |
| Nominal differential impedance | 100 Ω±10 % |

| Max. NEXT @ 25 ps risetime | Bottom route |
|---|---|
| Adjacent | 0.65 % |
| Basic-to-extended (diagonal) | 0.60 % |
| Basic-to-extended (opposite) | 0.73 % |
| Multiline (five multi-aggressor differential pairs) | 2.88 % max. |




PCB library on request (PADS/Dx-Designer)

SPICE models and S-Parameter on request

| | | |
|---|---|---|
| Differential propagation delay | Basic side: | 70 ps ± 5 ps |
| | Extended side: | 70 ps ± 5 ps |
| Differential skew | Between basic and extended side: | ±2 ps |
| | Within basic and extended side: | ±2 ps |

| | |
|---|---|
| Temperature range | -55 °C … +105 °C |
| Durability as per MTCA.0 spec. | 200 mating cycles |
| Termination technique | Press-in termination |
| Mating force | 100 N max., typically 60 - 80 N (depending on AdvancedMC™) |
| Withdrawal force | 65 N max., typically 40 - 60 N (depending on AdvancedMC™) |

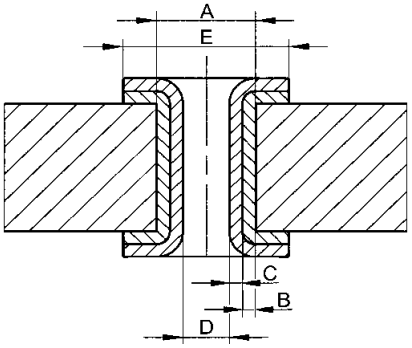
### Materials

| | |
|---|---|
| Moulded parts | Liquid Crystal Polymer (LCP), UL 94-V0 |
| Contacts | Copper Alloy |
| Contact surface | Pd/Ni with Au flash<br>Au over Ni on request |
| Packaging | Cardboard box (other packaging on request) |

### Recommended plated through hole specification

| | | | |
|---|---|---|---|
| | A | Drill hole-Ø | $0.64^{\pm 0.01}$ mm |
| | B | Cu | 25 - 35 µm |
| Tin plated PCB (HAL) | C | Sn | 5 - 15 µm |
| | D | Hole-Ø | 0.53 - 0.60 mm |
| Au / Ni plated PCB | C | Ni | 3 - 7 µm |
| | | Au | 0.05 - 0.12 µm |
| | D | Hole-Ø | 0.55 - 0.60 mm |
| Chemical tin plated PCB | C | Sn | 0.8 - 1.5 µm |
| | D | Hole-Ø | 0.56 - 0.60 mm |
| OSP copper plated PCB | C | --- | --- |
| | D | Hole-Ø | 0.56 - 0.60 mm |
| | E | Pad size | min. 0.95 mm |

The press-in zone of the AdvancedMC™ connector is tested according to Telcordia/Bellcore GR 1217CORE Part7. It is approved to be used with a plated through hole according IEC 60352-5 with a diameter of $0.55^{\pm 0.05}$ mm (drilled hole $0.64^{\pm 0.01}$ mm).
Based on our experiences regarding the production process of the PCB manufacturer we recommend a plated through hole configuration like shown in the above spreadsheet. To achieve the recommended plated through hole diameter, it is important to specify especially the drilled hole diameter of $0.64^{\pm 0.01}$ mm to your PCB supplier.
For drillings use e.g. drill bit # 72 (0.025" ≈ 0.64 mm).





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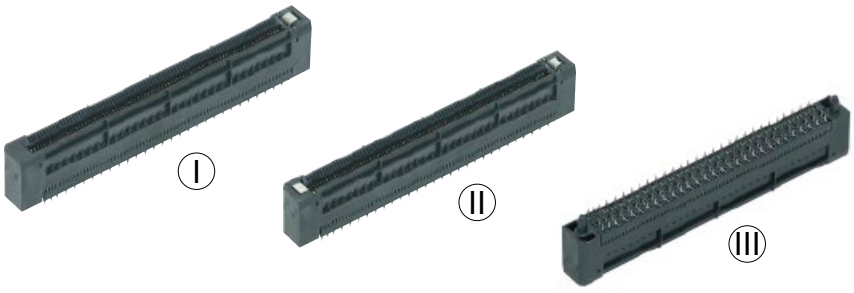
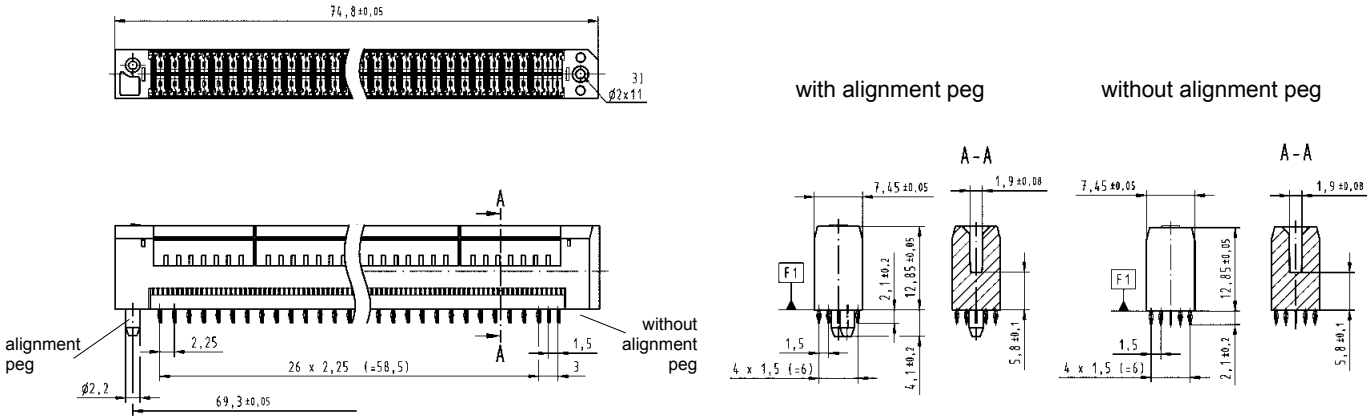
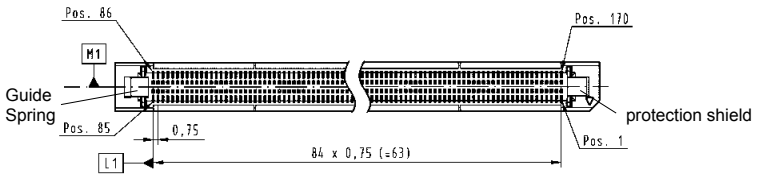



## Card edge connectors, straight

| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| AdvancedMC™ connectors for MicroTCA™ | | | |
| with GuideSpring (I) | 170 | 2.1 | 16 11 170 5202 000 |
| with GuideSpring and protection shield (II) | 170 | 2.1 | 16 11 170 5205 000 |
| with GuideSpring and alignment peg (III) | 170 | 2.1 | 16 11 170 5206 000 |
| with GuideSpring, protection shield and alignment peg | 170 | 2.1 | 16 11 170 5207 000 |



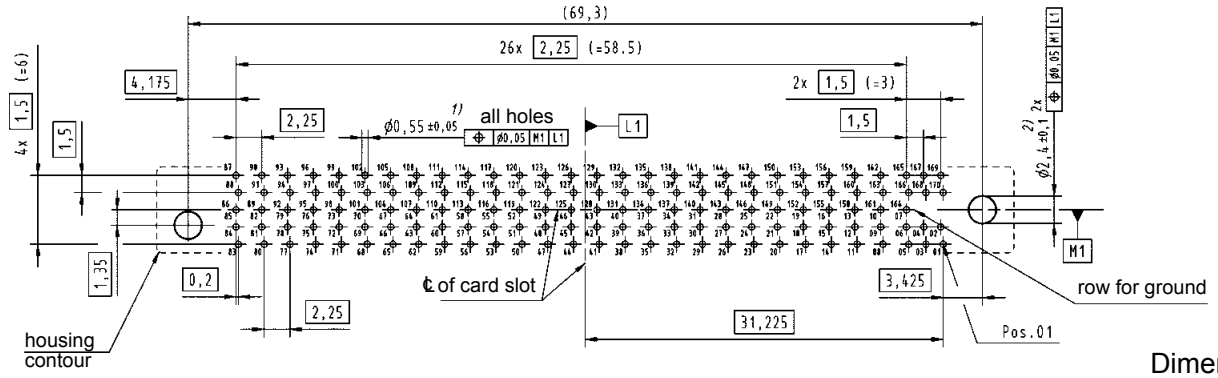




1) recommended plated through hole specification see page 12.12

2) non-metallized drillings
optional: for part numbers
16 11 170 5202 000 and 16 11 170 5205 000
mandatory: for part numbers
16 11 170 5206 000 and 16 11 170 5207 000

3) for optional fixing: use self-tapping screws for plastic, 2.2 x length
(length = PCB thickness + min. 6.5 mm to max. 10 mm)
e.g. HARTING part number 09 06 001 9974
Screwing torque references:
PCB + 6.5 mm: 20 cNm
PCB + 10 mm: 40 cNm

## Board drillings (view magnified)




Dimensions [mm]

TCA



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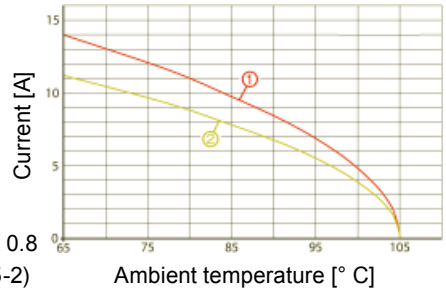
## Technical characteristics

| | |
|---|---|
| Design according | PICMG MTCA.0 R1.0<br>(RoHS compliance) |
| Total number of contacts | 96 |
| Power contacts | 24 |
| Signal contacts | 72 |
| Sequential contact engagement | |
| 1st | Power 4–11 |
| 2nd | Power 1–3, power 12–24 |
| 3rd | Signal A2–H9 |
| 4th | Signal A1 |
| Working current | |
| Power contacts | 9.3 A @ 80 % derating acc. IEC 60512 and 70 °C ambient temperature and 30 °C temperature rise |
| Signal contacts | 1 A @ 80 % derating acc. IEC 60512 and 70 °C ambient temperature |
| Initial contact resistance | |
| Power contacts | ≤ 5 mΩ |
| Signal contacts | ≤ 25 mΩ |
| Initial insulation resistance | ≥ 100 MΩ min. |
| Temperature range | -55 °C … +105 °C |
| Durability | 200 mating cycles |
| Termination technique | Press-in termination |
| Mating force | 145 N max. |
| Withdrawal force | 110 N max. |

Derating for MicroTCA™ power contacts

Contact loading acc. MTCA.0




① Derating

② Derating @ $I_{max.}$ x 0.8 (acc. IEC 60512-5-2)

**Materials**

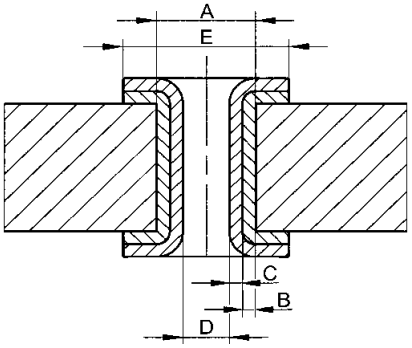
| | |
|---|---|
| Moulded parts | PBT, glass-fibre filled, UL 94-V0 |
| Contacts | Copper Alloy |
| Contact surface | |
| Power contacts: | selectively gold plated |
| Signal contacts: | selectively PD/Ni plated |
| Packaging | Tray packaging (other packaging on request) |

**Recommended plated through hole specification**

| | | | |
|---|---|---|---|
| | A | Drill hole-Ø | $0.7^{\pm 0.02}$ mm |
| | B | Cu | 25 - 35 µm |
| Tin plated PCB (HAL) | C | Sn | 5 - 15 µm |
| | D | Hole-Ø | 0.60 - 0.65 mm |
| Au / Ni plated PCB | C | Ni | 3 - 7 µm |
| | | Au | 0.05 - 0.12 µm |
| | D | Hole-Ø | 0.60 - 0.65 mm |
| Chemical tin plated PCB | C | Sn | 0.8 - 1.5 µm |
| | D | Hole-Ø | 0.60 - 0.65 mm |
| Silver plated PCB | C | Ag | 0.1 - 0.3 µm |
| | D | Hole-Ø | 0.60 - 0.65 mm |
| OSP copper plated PCB | C | --- | --- |
| | D | Hole-Ø | 0.60 - 0.65 mm |
| | E | Pad size | min. 1.0 mm |

The press-in zone of the MicroTCA™ power connector is tested according to Telcordia/Bellcore GR 1217CORE Part7. It is approved to be used with a plated through hole according IEC 60352-5 with a diameter of $0.60^{+0.05}$ mm (drilled hole $0.70^{\pm 0.02}$ mm).

Based on our experiences regarding the production process of the PCB manufacturer we recommend a plated through hole configuration like shown in the above spreadsheet. To achieve the recommended plated through hole diameter, it is important to specify especially the drilled hole diameter of $0.70^{\pm 0.02}$ mm to your PCB supplier.



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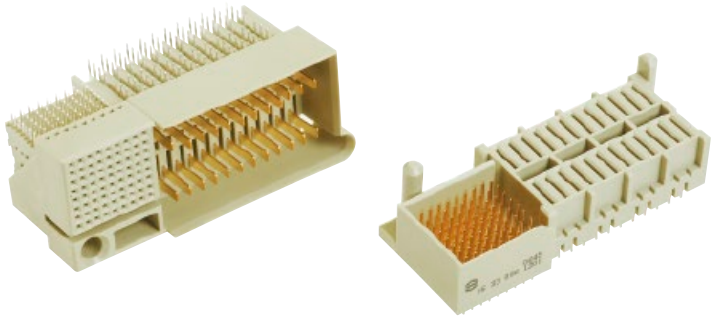
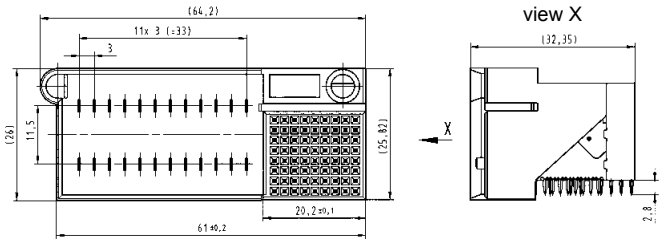
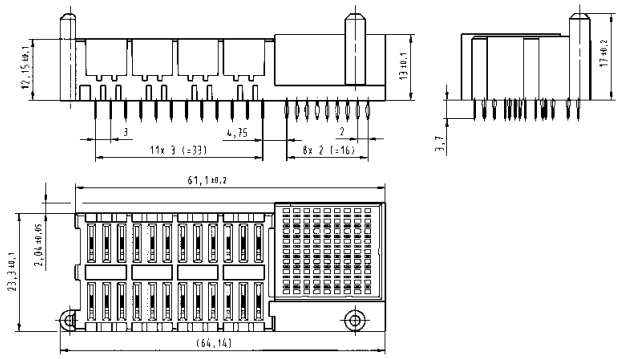


| Identification | No. of contacts | Contact length [mm] termination side | Part number |
|---|---|---|---|
| **Power output connectors for MicroTCA™** | | | |
| module version | 96 | 2.8 | 16 34 096 1101 000 |
| backplane version | 96 | 3.7 | 16 33 096 1201 000 |

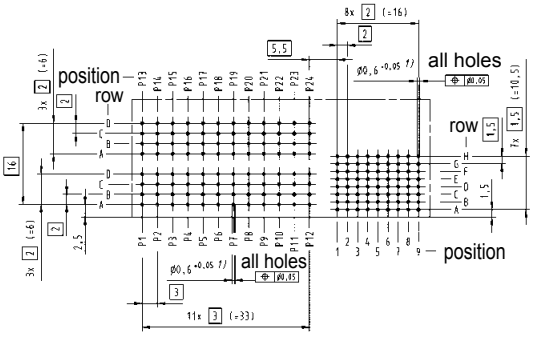
## Module version

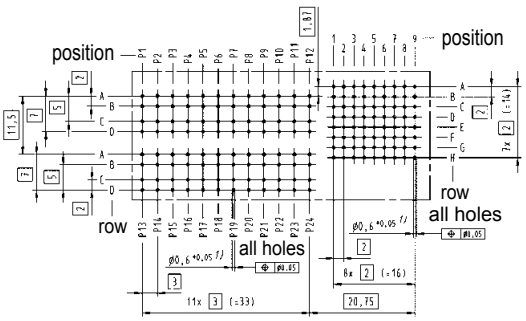



## Backplane version




## Board drillings




1) recommended plated through hole specification see page 12.14

Dimensions [mm]



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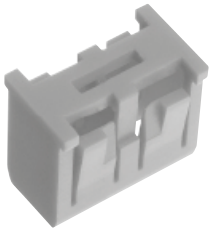
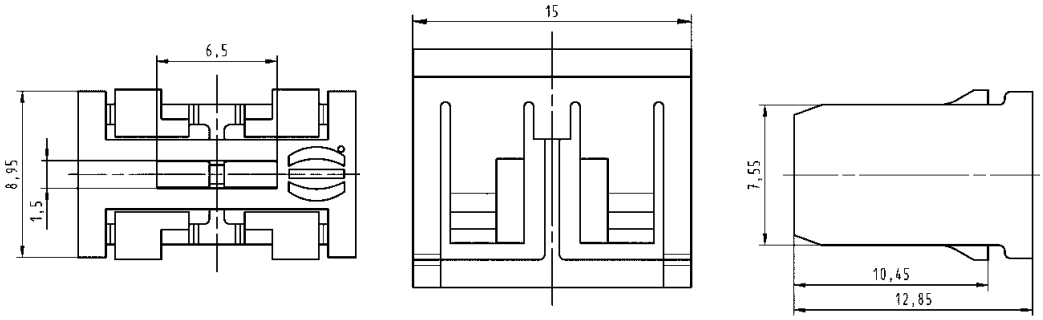
# Protection Block for MicroTCA™ backplanes



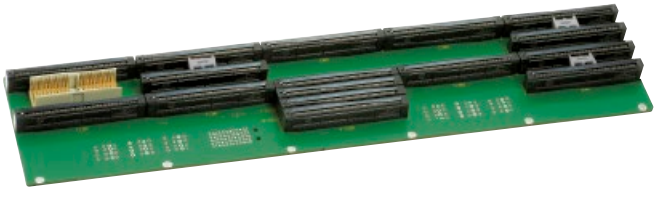
| Identification | Part number |
|---|---|
| MicroTCA™ Protection Block | 16 79 000 0010 000 |




The MicroTCA™ specification defines modules with the option of multiple mating interfaces like the MCH module for system management and switching. There are four different pitches defined for the module interfaces and the backplane connectors respectively, the basic unit is called horizontal pitch (HP) and is 5.08 mm (0.2 inch).

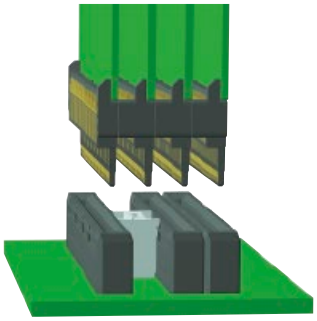
| | | |
|---|---|---|
| Compact-Size | 3 HP | 15.24 mm |
| Mid-Size | 4 HP | 20.32 mm |
| Full-Size | 6 HP | 30.48 mm |
| MCH | 1.5 HP | 7.62 mm |

Any MCH (or other multiple mating interface modules) with more than two mating interfaces (2x MCH-pitch 1.5 HP = Compact-Size pitch 3 HP) could unintentional mate with connectors of the adjacent slot or could be plugged into the wrong slot. Even though the pin-assignment and e-keying for the MCH is defined, it can cause system failures or even destroy hardware if a MCH is inserted into two adjacent AMC Compact-Size slots. For other multiple mating interface modules, this situation is even worse, because neither e-keying nor pin assignment is specified in MTCA.0.



MicroTCA™ backplane with protection blocks

To prevent errors in case of misinsertion, MTCA.0 R1.0 chapter 2.13 outlines protection blocks that occupy the space between two adjacent connectors in a Compact-Size slot. Furthermore this protection block can be used for keying functions of multiple mating interface modules.



The free space between the backplane connectors is occupied by the protection block

HARTING designed a protection block fully independent of the backplane and sub rack design. The HARTING protection block is clipped between two connectors, hence no fixing features (holes, clips...) need to be designed into the backplane or the sub rack mechanics. The assembly is done quick and easy by hand. It can even be installed easily after the backplane is mounted with a simple flat-head screwdriver, an easy removal is possible in a similar way. The keying block can be placed into four different positions, hence a keying of multitongue modules by using tongues with a cutout is possible.





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# Notes





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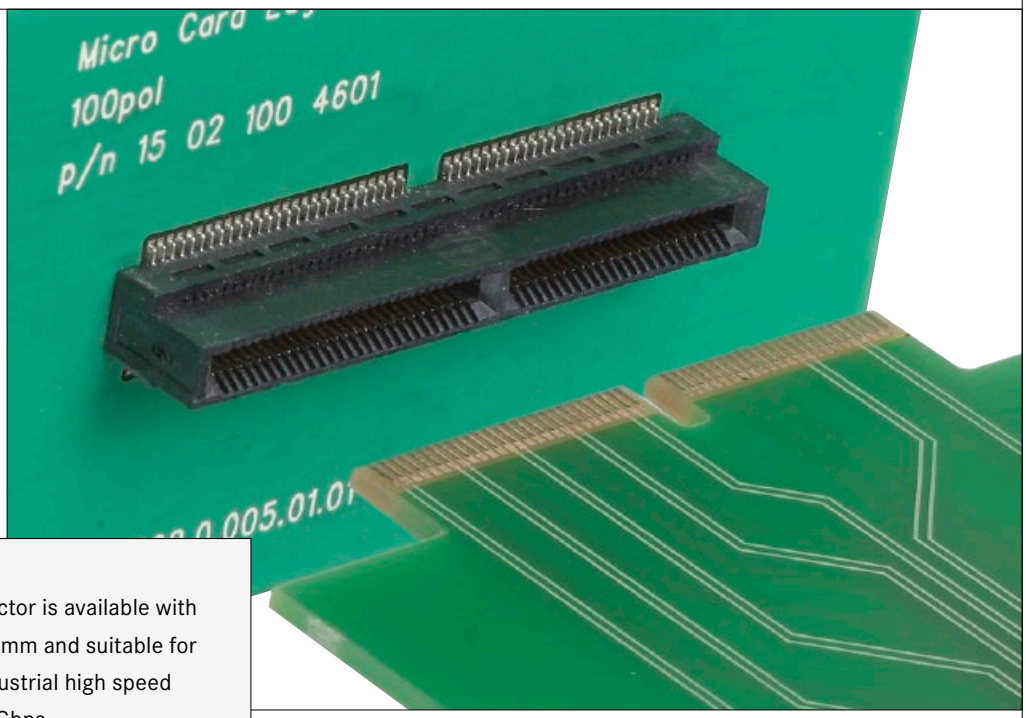
# 13. Micro Card Edge Connectors




The HARTING Micro Card Edge Connector is available with 40 and 100 contacts at a pitch of 0.8 mm and suitable for telecommunications, medical and industrial high speed applications with data rates up to 14 Gbps.

*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| ● | | ● | | ● | | | ● | | ● | |

**Cable termination**

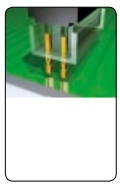
*Han-Quick Lock®* | *IDC* | *Crimp*

*Screw* | *Cage clamp* | *Axial screw*

**PCB termination**

*THT* | *SMC* | *SMT*

*Press-in*

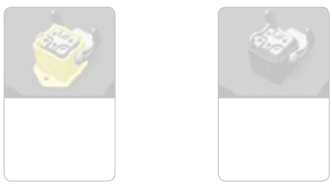


**Application standard**

SCSI

**Housing integration**

*Separate housing* | *Integrated housing*



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# 13. Micro Card Edge Connectors

## Contents


| | Page |
|---|---|
| Micro Card Edge connector system – introduction | **13.02** |
| Technical characteristics, board dimensions | **13.05** |
| 40pin connector | **13.06** |
| 100pin connector | **13.07** |






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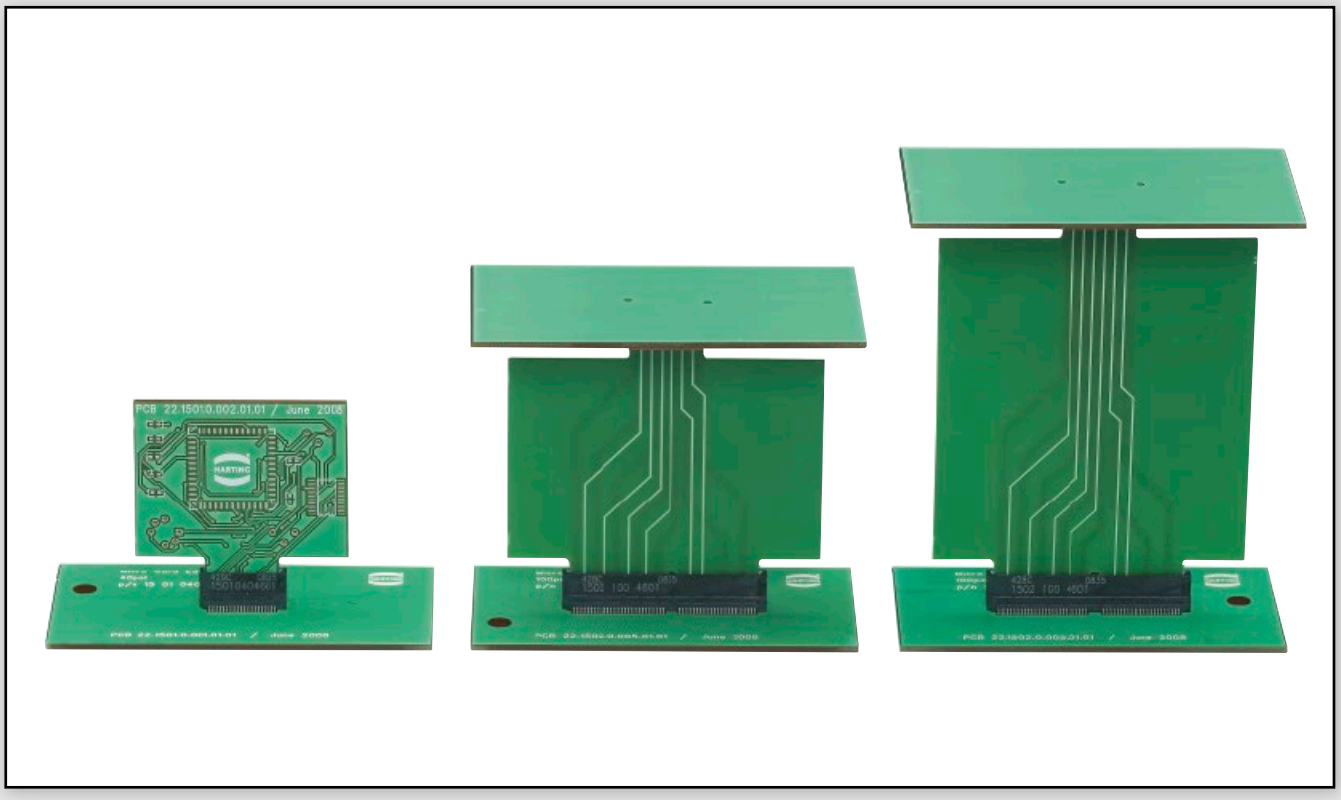
## MICRO CARD EDGE CONNECTORS

HARTING offers the new Micro Card Edge Connector in surface-mounting technology for card gauges of 1.6 mm. It is suitable for board to board mezzanine as well as for small ´pluggable daughter card applications´. The key feature for mezzanine applications is the very flexible stacking height of parallel boards by utilizing a small board between the connectors. This gives flexibility in the mechanical design of the system.
The HARTING Micro Card Edge Connector is able to transfer data rates up to 14 Gbps, suitable for telecommunications, medical and industrial high speed applications. It is available with 40 and 100 contacts at a pitch of 0.8 mm. An extremely smooth contact surface achieved by high performance stamping tools and a special after – treatment ensures low insertion forces and a high contact reliability.
HARTING´s Micro Card Edge Connector offers excellent manufacturing features like a tape & reel packaging with a pick & place pad for nozzle in high volume productions.





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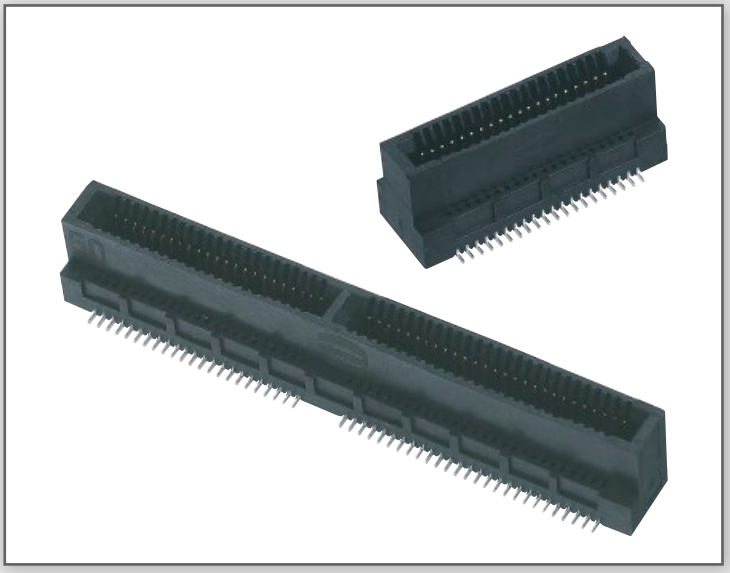
# Specific features of the product range

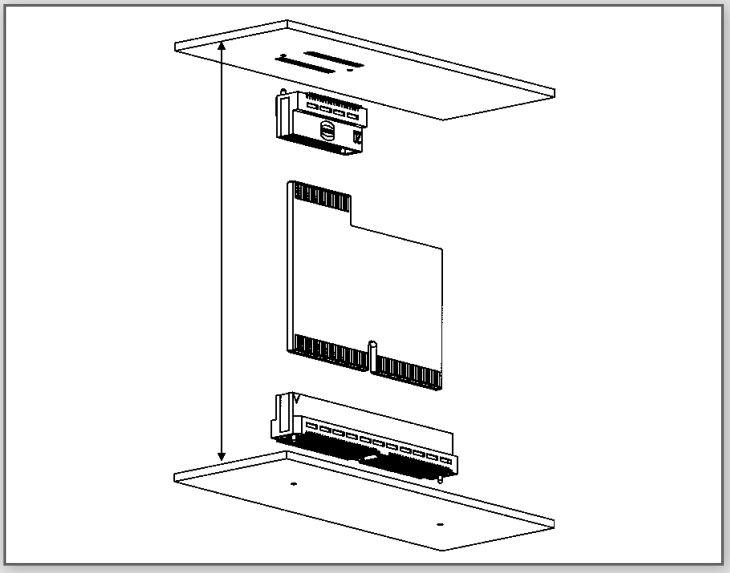
High speed data transmission up to 14 Gbps between mezzanine or daughter card boards in telecom, medical, datacom and industrial applications.



Excellent manufacturing features for high volume production

- SMT termination
- Tape & reel packaging with pick & place pad for nozzle

Flexible stacking height of parallel boards by utilizing a small board between the connectors.







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# Notes





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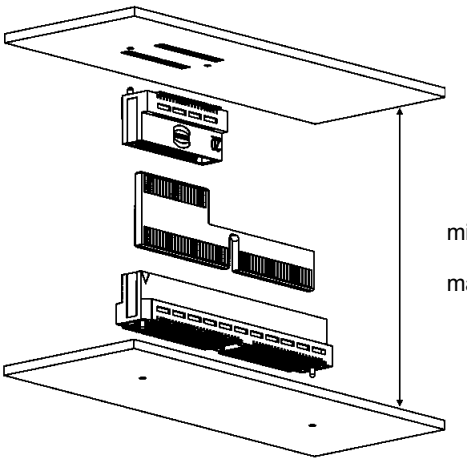
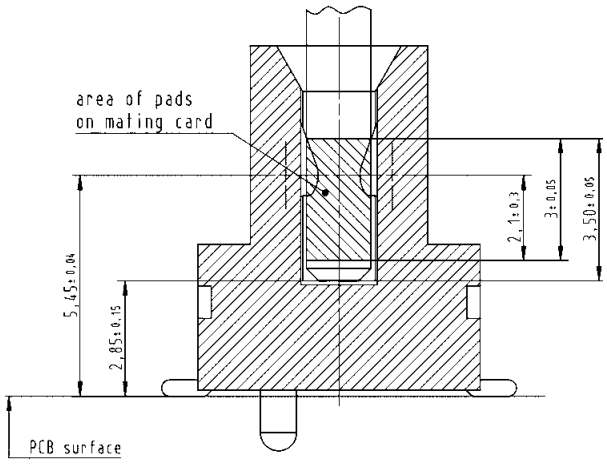
| | |
|---|---|
| Contact spacing | : 0.8 mm |
| Working current | : 1.7 A at 80 °C ambient |
| Test voltage | : 600 V AC |
| Mating cycles | : 200 |
| Number of contacts | : 40, 100 |
| Mating card thickness | : 1.6 + 0.1 mm |
| Operating temperature | : -55 °C … +125 °C |
| Max processing temperature | : 230 °C for 60 sec. or<br>260 °C for 20 sec. |
| ROHS-compliance | : yes |
| Materials | |
| Mouldings | : LCP, glass-fibre filled, UL 94-V0 |
| Contacts | : Copper alloy with Ni plating |
| Contact surface | |
| Contact zone | : Pd/Ni plating with Au flash |
| Termination zone | : Sn/Ni plating |

## Board dimensions



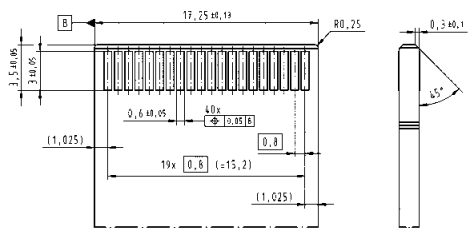
min. 20 mm

max. ∞

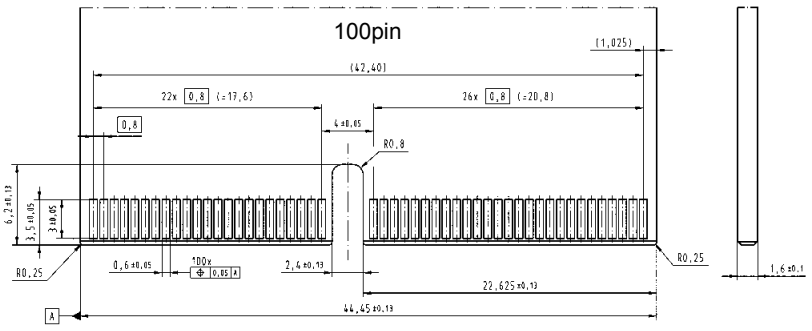



## Recommended mating card layout

40pin



100pin







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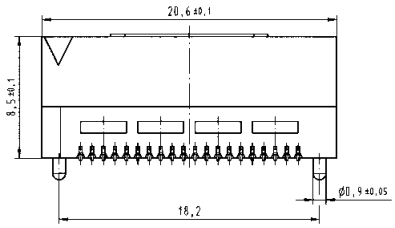
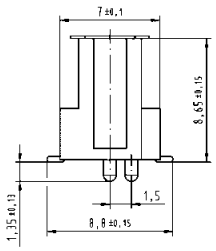
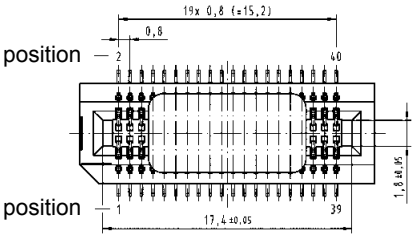
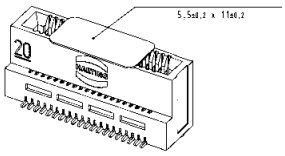
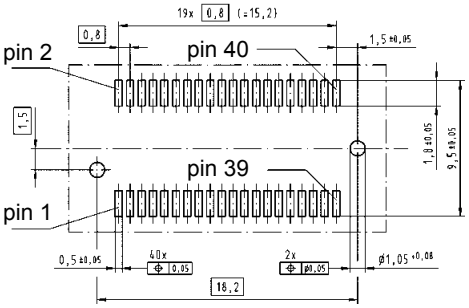
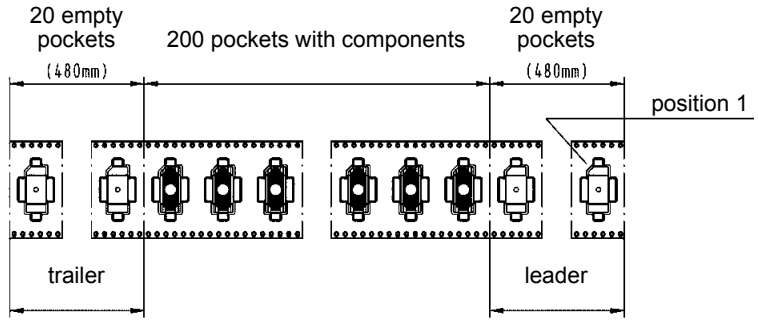
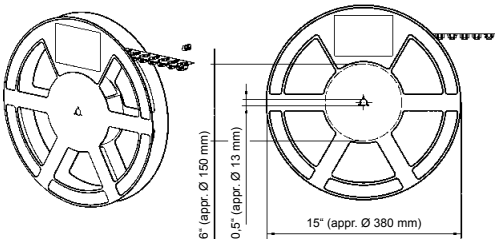
## 40pin connector

| Identification | Number of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Micro Card Edge connector<br>2800 pieces in a “Tape and Reel” packaging (14 reels with 200 pcs.) | 40 | 15 01 040 4601 040 |  |  |
| 200 pieces in a “Tape and Reel” packaging | 40 | 15 01 040 4601 042 |  | |
| Single connector sample | 40 | 15 01 040 4601 333 |  | |
| Board layout | | |  | |
| “Tape and Reel” packaging | | |  | |
| Reel dimensions | | |  | |



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# Micro Card Edge connector

## 100pin connector

| Identification | Number of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Micro Card Edge connector | | | | |
| 1800 pieces in a “Tape and Reel” packaging (9 reels with 200 pcs.) | 100 | 15 02 100 4601 040 | | |
| 200 pieces in a “Tape and Reel” packaging | 100 | 15 02 100 4601 042 | | |
| Single connector sample | 100 | 15 02 100 4601 333 | | |
| Board layout | | | | |
| “Tape and Reel” packaging | | | | |
| Reel dimensions | | | | |



MCE



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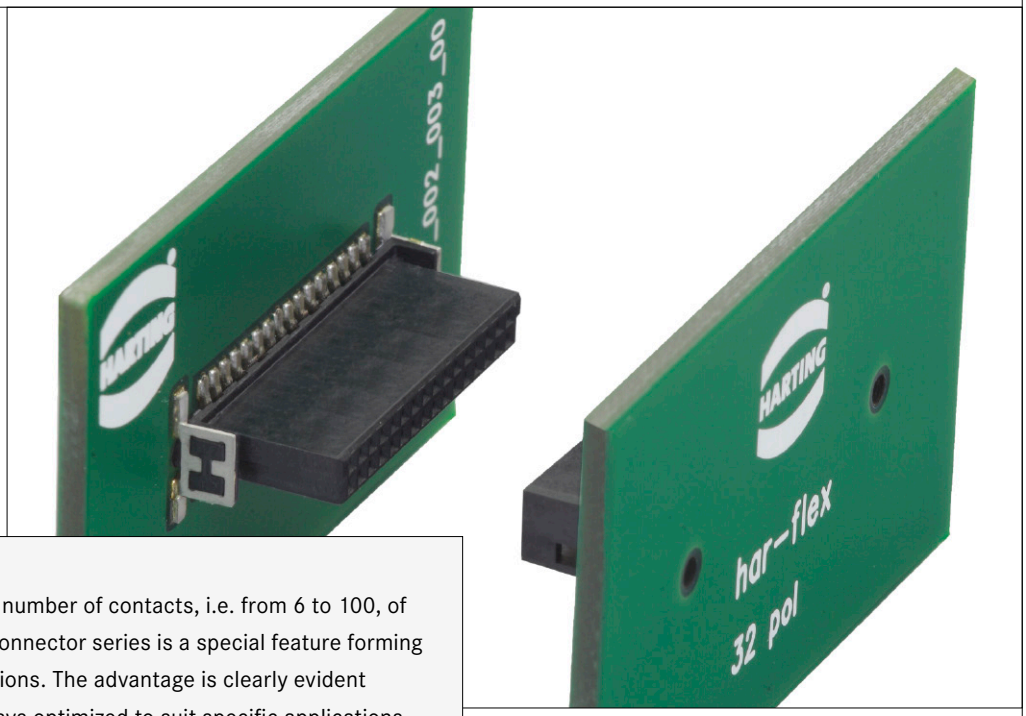
# 14. *har*-flex® Connectors




The continuous scalability by an even number of contacts, i.e. from 6 to 100, of the HARTING's *har*-flex® mezzanine connector series is a special feature forming an ideal basis for customized applications. The advantage is clearly evident considering that the connector is always optimized to suit specific applications on the device PCB, while also covering the medium- and small-scale volume range that is typical for the production of industrial devices.

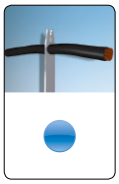
*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| ● | ● | ● | | ● | ● | | | | ● | |

**Cable termination**

*Han-Quick Lock®*

*IDC*

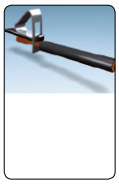


●

*Crimp*

*Screw*

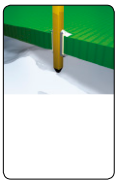
*Cage clamp*



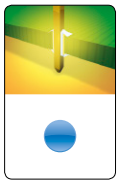
*Axial screw*

**PCB termination**

*THT*

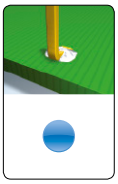


*THR (SMC)*



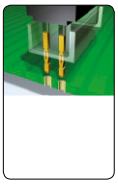
●

*SMT*



●

*Press-in*



**Application standard**

SCSI

**Housing integration**

*Separate housing*

*Integrated housing*

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## Contents


| | Page |
|---|---|
| *har*flex® connector system – introduction | **14.02** |
| Technical characteristics | **14.06** |
| Male connectors, straight | **14.12** |
| Female connectors, straight | **14.16** |
| Male connectors, angled | **14.20** |
| Female connectors, angled | **14.24** |
| Female connectors with IDC termination | **14.26** |
| Cable assemblies | **14.30** |






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## *har*-flex® CONNECTORS

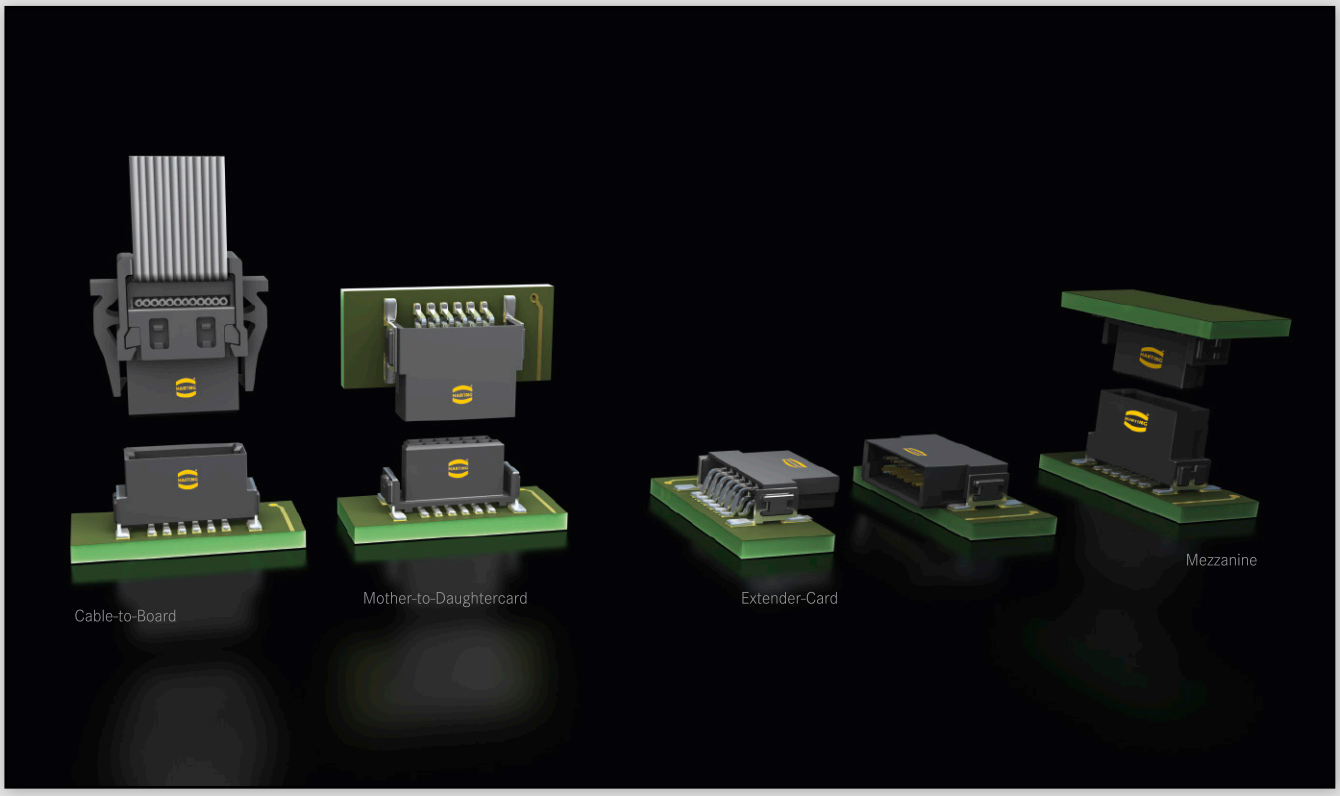
With *har*-flex®, HARTING has developed a general-purpose PCB connector series for internal and external Device Connectivity. The continuous scalability by an even number of contacts from 6 to 100 is a special feature forming an ideal basis for customized applications. The advantage is clearly evident considering that the connector is always optimized to suit specific applications on the device PCB, while also covering the medium and small scale volume range that is typical for the production of industrial devices.

This flexibility is new – HARTING turns an individual design into a standard component. No special tooling changes are needed for customer-specific solutions, thus HARTING can realize a short delivery time.

## PRODUCT DIVERSITY

The *har*-flex® product range is based on a 1.27 mm grid. With its diverse variants, HARTING provides connectivity solutions for many different board-to-board and cable-to-board applications. For example, two straight connectors are used for mezzanine applications, two angled connectors for extender cards on one level, and a combination of straight and angled connectors allows the well-known pairing of mother and daughtercards. By using individually tailored IDC flat cables, it is possible to bridge long PCB distances.

Smaller, more powerful and more robust at the same time is the credo in all areas on the way to I4.0. Due to the miniaturized design and the high variability of the *har*-flex® connectors, device manufacturers have a freely scalable connection technology that meets the requirements of miniaturization.



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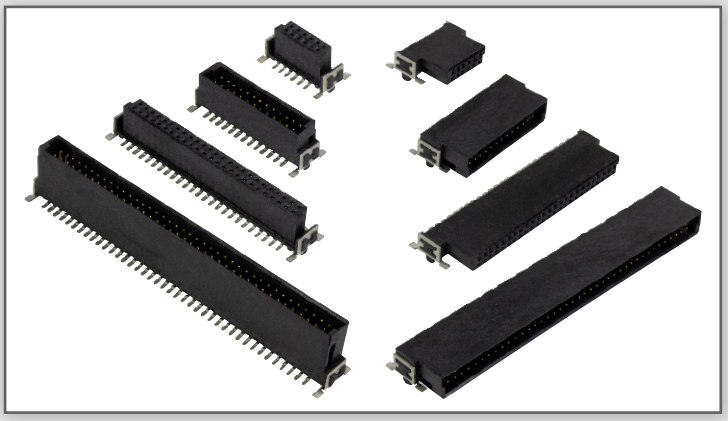
# Advantages of the product range

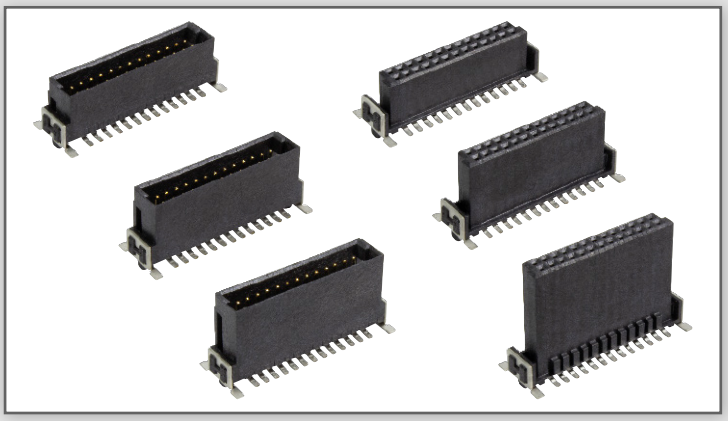
**Variable pole counts for highest flexibility**

- Male and female connectors with even pole counts from 6 to 100 contacts available
- This flexibility in the choice of number of contacts combined with high density contact spacing allows for an optimal use of PCB space, thereby achieving overall space savings and cost efficiencies



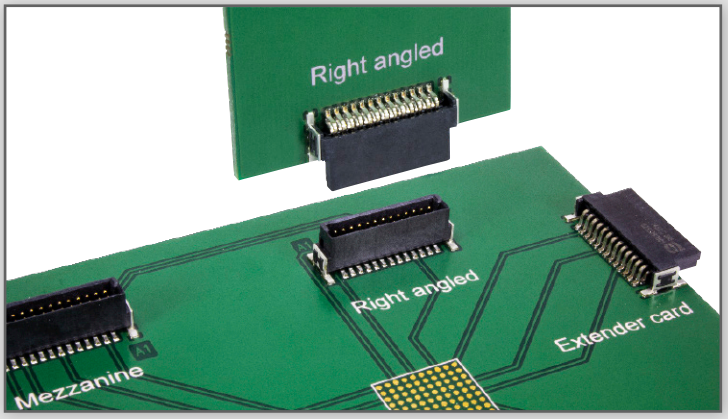
**Flexible board-to-board distances**

- Different stacking heights and a wiping length of 1.5 mm allow for (mezzanine) board-to-board distances from 8 to 20 mm



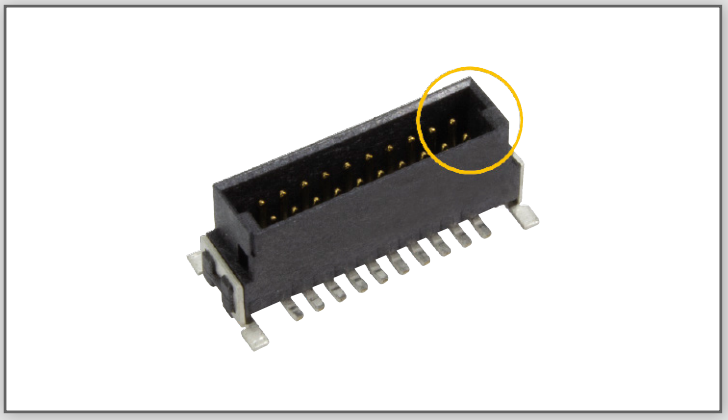
**High-quality contacts for a high number of mating cycles**

- Polished Performance Level 1 (PL1) contacts ensure reliable connections for up to 500 mating cycles
- A gas test after the initial 250 of 500 mating cycles ensures high quality and long-term reliability




**Accurate mating process**

- Mating profiles prevent mating in the opposite direction
- Slanted guidances compensate angle and center offsets and ensure a secure mating process







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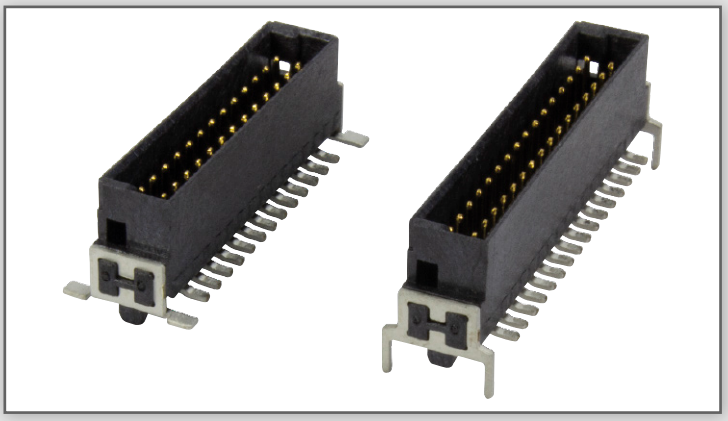
# Advantages of the product range

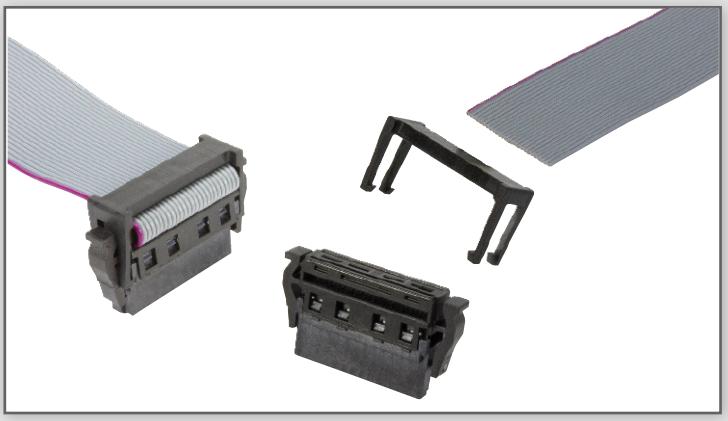
**Robust fixation on the PCB**

- SMT and THR hold-downs allow for a robust mechanical fixation
- SMT hold-downs reduce the mechanical strain on the signal pins
- THR hold-downs are optionally available for strong protection against particularly high mechanical transverse forces



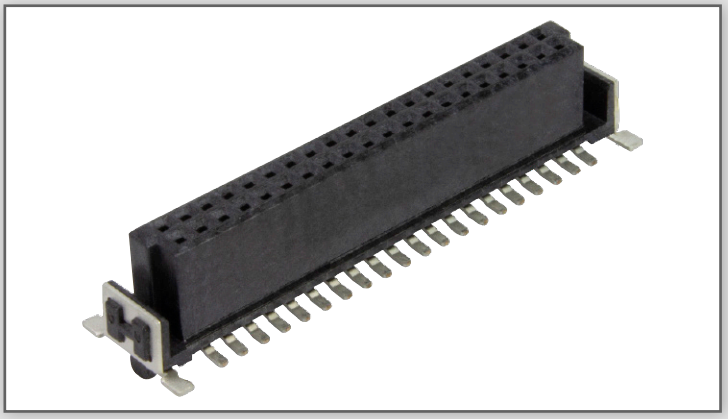
**Secure handling of cable connectors**

- Vibration-proof catch mechanism on both sides prevents accidental loosening
- Optional strain relief protects the IDC contacts against pulling forces
- Customized cable assemblies provide perfectly fitting solutions



**Reliable soldering process**

- A reliable soldering process is ensured by a contact coplanarity of ≤ 0.1 mm
- An optimal position on the PCB is achieved by guiding pegs



**Automated processing features**

- Tape & reel packaging provides protection during shipping and handling
- SMT and THR versions are suitable for automatic pick & place assembly and reflow soldering

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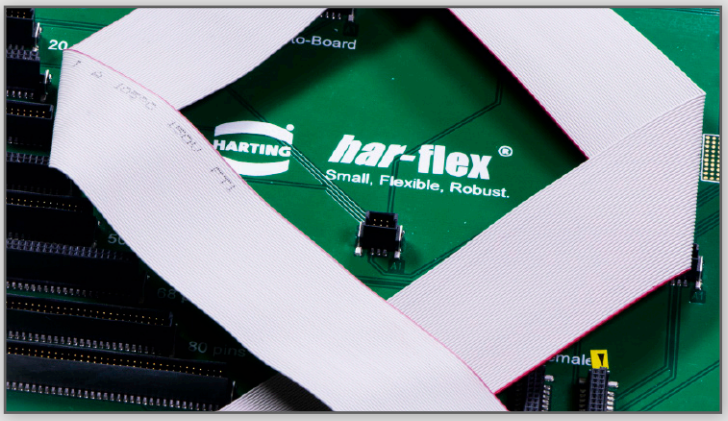
# Advantages of the product range

**Different types of cable**

- Number of contacts: 6 - 100
- AWG 30/7
- Pitch: 0.635 mm
- Flame retardant acc. UL 758: VW-1
- **Standard (PVC)** Operating temperature: -20 °C ... +105 °C
- **Halogen free (TPE)** Operating temperature: -40 °C ... +125 °C

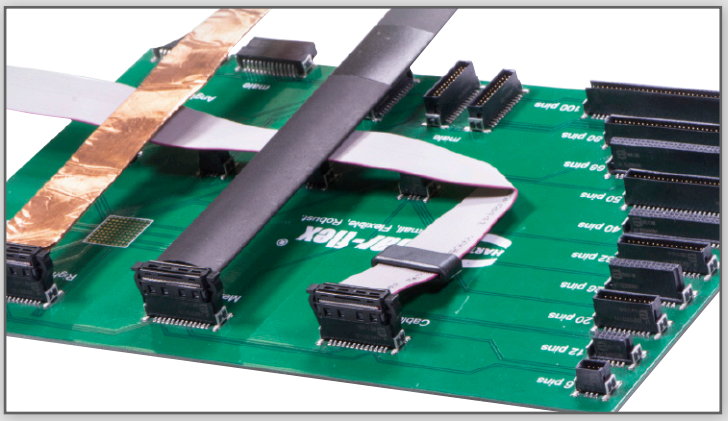



**Customised**

We can add value with:

- Ferrit cores
- Shrinking tube
- Customised folding, customised labels

Your cable is not mentioned?
Don't be afraid. We will handle it. Please tell us your requirements.







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| | |
|---|---|
| Number of contacts | 6, 8, 10 … 96, 98, 100 |
| Connector pitch | 1.27 mm x 1.27 mm<br>[0.050'' x 0.050''] |

**Clearance and creepage distance**

| | |
|---|---|
| Board connectors (SMT) | min. 0.4 mm |
| Cable connectors (IDC) | |
| AWG 30/1 (solid) | min. 0.35 mm |
| AWG 30/7 (stranded) | min. 0.4 mm |
| Test voltage $U_{r.m.s.}$ | 500 V |
| Contact resistance | < 25 mΩ |
| Insulation resistance | > 10 GΩ |
| Insertion and withdrawal force | approx. 0.5 N / contact |

**Working temperature range**

| | |
|---|---|
| for connectors: | – 55 °C … + 125 °C |
| for flat cable assembly: | depends on cable type |
| The higher temperature limit includes the local ambient and heating effects of the contacts under load | |
| Temperature during reflow soldering (acc. to ECA/IPC/JEDEC J-STD-075 Level PSL R0) | min. 150 s > 217 °C<br>min. 30 s > 240 °C |

**Electrical termination**

| | |
|---|---|
| Board connectors | SMT (Surface Mount Technology)<br>THR |
| Cable connectors | IDC (Insulation Displacement Connection) |

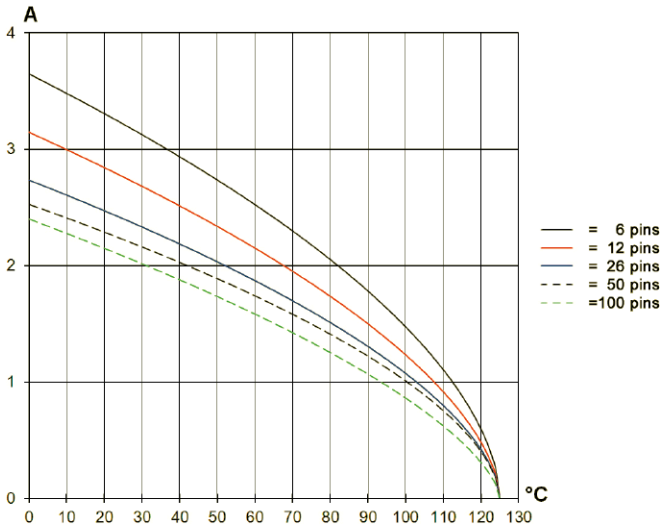
**Materials**

| | |
|---|---|
| Moulding material | LCP |
| UL approval | UL 94-V0 |
| CTI value (Comparative Tracking Index) | 175 |
| Contacts base material | Copper alloy |
| Contact surface | |
| Mating side | |
| Board connectors | Au over PdNi (acc. performance level) |
| Cable connectors | Au over PdNi (acc. performance level) |
| Termination side | |
| Board connectors (SMT / THR) | Sn |
| Cable connectors (IDC) | Sn |

## Current carrying capacity acc. to IEC 60512-5-2

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals.
The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60512-5-2.




Derating curve @ $I_{max}$ * 0.8 (IEC 60512-5-2)

## Durability

***Performance level 1*** (recommended for majority of applications)

Initial 250 mating cycles, 10 days gas test (25 °C/75 % r.h.) using $H_2S$ 10 ppb, $NO_2$ 200 ppb, $CL_2$ 10 ppb, $SO_2$ 200 ppb. Measurement of contact resistance. The remaining 250 mating cycles are subject to measurement of contact resistance and visual inspection. No abrasion of the contact finish through to the base material. No functional impairment.

Part number definition: 15 . . | . . . | 2 . . . | . . .

***Performance level 2*** (available on request)

Initial 125 mating cycles, 4 days gas test (25 °C/75% r.h.) using $H_2S$ 10 ppb, $NO_2$ 200 ppb, $CL_2$ 10 ppb, $SO_2$ 200 ppb. Measurement of contact resistance. The remaining 125 mating cycles are subject to measurement of contact resistance and visual inspection. No abrasion of the contact finish through to the base material. No functional impairment.

Part number definition: 15 . . | . . . | 6 . . . | . . .

***Performance level S4*** (available on request)

Defined contact surface of min. 0.06 µm Au over 0.7+0.2 µm PdNi.

Part number definition: 15 . . | . . . | 5 . . . | . . .



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## Working voltage acc. to IEC 60 664-1

The working voltage depends on user specific operational conditions. Depending on the installation category, the degree of pollution and the entire electrical environment, the working voltage is different. The standard IEC 60 664-1 specifies, in general, the minimum insulation distances for equipment. But it can also be used to determine the maximum working voltage with given requirements.

The following table shows the most common conditions applicable for the *har*-flex® connectors and exemplary calculations for the working voltage. For installation category, degree of pollution and other requirements which are not shown in the table we refer to the IEC 60 664-1.

| Clearance / Creepage distance | 0.4 mm | | | |
|---|---|---|---|---|
| CTI-Value | < 400 | | | |
| Isolation group | III a/b | | | |
| Electrical field type | Case A (Inhomogeneous field) | | Case B (Homogeneous field) | |
| Installation category | I | II | I | II |
| Degree of pollution | 1 | 1 | 1 | 1 |
| **Working voltage max.** | **150 V** | **100 V** | **150 V** | **150 V** |

Explanations:

– CTI value and isolation group are fixed values by the *har*-flex® connector characteristics.

– Installation category I: Equipment is intended for use only in appliances or installation parts, in which no overvoltages can occur. Equipment in this installation category in normally operated at extra low voltage.

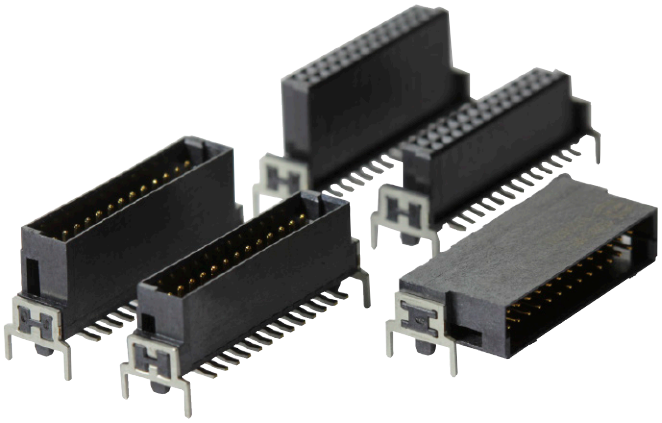
– Installation category II: Equipment is intended for use in installations or parts of installations, in which lightning overvoltages need not be considered. Overvoltages caused by switching must be taken into account.

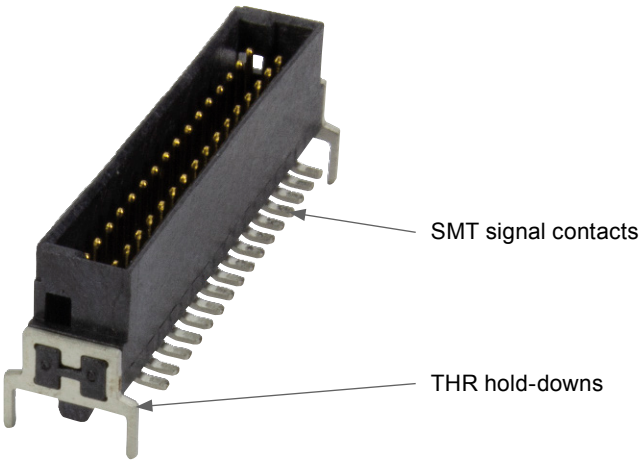
– Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.

– Pollution degree 2: Only non-conductive pollution occurs. A temporary conductive caused by condensation must be expected occasionally.

## *har*-flex® with THR hold-downs

THR stands for "**T**hrough **H**ole **R**eflow", which appropriately describes the underlying technology. While SMT (i.e. "**S**urface **M**ount **T**echnology") connections are created by soldering the connector on the PCB surface during the reflow soldering process, THR means that the hold-down pins are inserted and soldered into designated holes on the PCB. This combines the fully automatic reflow soldering process with the advantages of traditional wave soldering: the inserted hold-down pins make the *har*-flex® more stable mechanically and more resilient to shear forces. This is especially relevant for PCB connectors and particularly for applications that require blind mating - meaning that the connectors are hidden from view during the mating process, which increases the chance of high mechanical stresses on the contacts. The resulting risk is mitigated by using hold-downs (additional mechanical fixing features). The optionally available THR hold-downs increase the robustness and reliability and protect the SMT signal contacts, which is particularly useful for angled connectors mounted on daughtercards, for example.







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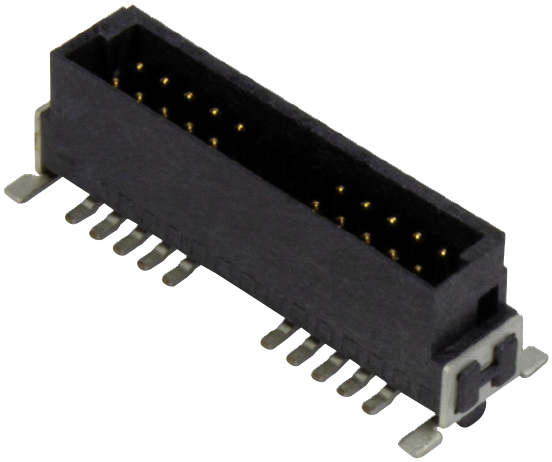
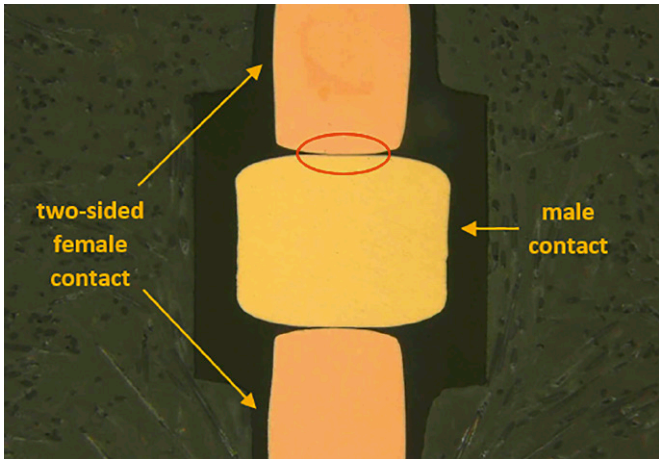
## Partial loading



In specific cases it is possible that special requirements are not covered by the available standard variants. For example, it might be necessary to have a higher working voltage or allow for PCB traces under the connector. In such cases, it is possible to load the connector partially, i.e. leave out certain contact pins. By this means it is possible to increase the creepage and clearance distances and create free space for additional PCB tracks under the connector. HARTING offers the possibility to leave out one or several contacts in any position, which ensures a high degree of flexibility.

## Reliable contacting




The production of stamped contacts has been one of HARTING's core competencies for a long time. HARTING leveraged this experience to create reliable contacts for *har*-flex®. To achieve this goal, both a high-quality contacting area and a suitable plating are crucial in order to maintain the contacting functionality of the contact over the course of its lifetime. The female contact is made with high precision, and a special polishing process ensures a defined contacting area, so that the contact point features a particularly high quality. In conjunction with the standard plating for performance level 1 this method guarantees a reliable electric connection for at least 500 mating cycles.



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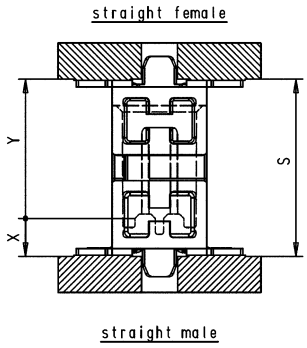
## Stacking heights for mezzanine applications

Straight male and female *har*-flex® variants are available in three different stacking heights each. In conjunction with a wiping length of 1.5 mm these *har*-flex® variants can cover PCB distances from 8 to 20 mm in mezzanine applications.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| S | 20 mm | | | | | | | | |
| | 19 mm | | | | | | | | |
| | 18 mm | | | | | | | | |
| | 17 mm | | | | | | | | |
| | 16 mm | | | | | | | | |
| | 15 mm | | | | | | | | |
| | 14 mm | | | | | | | | |
| | 13 mm | | | | | | | | |
| | 12 mm | | | | | | | | |
| | 11 mm | | | | | | | | |
| | 10 mm | | | | | | | | |
| | 9 mm | | | | | | | | |
| | 8 mm | | | | | | | | |
| X&Y | stacking heights | male 1.75 mm female 6.25 mm | male 3.25 mm female 6.25 mm | male 1.75 mm female 9.05 mm | male 3.25 mm female 9.05 mm | male 4.85 mm female 9.05 mm | male 1.75 mm female 13.65 mm | male 3.25 mm female 13.65 mm | male 4.85 mm female 13.65 mm |
| S | PCB distance | 8 mm - 9.5 mm | 9.5 mm - 11 mm | 10.8 mm - 12.3 mm | 12.3 mm - 13.8 mm | 13.9 mm - 15.4 mm | 15.4 mm - 16.9 mm | 16.9 mm - 18.4 mm | 18.5 mm - 20 mm |
| | part numbers | 1511... 1521... | 1512... 1521... | 1511... 1522... | 1512... 1522... | 1513... 1522... | 1511... 1523... | 1512... 1523... | 1513... 1523... |

## Mating options

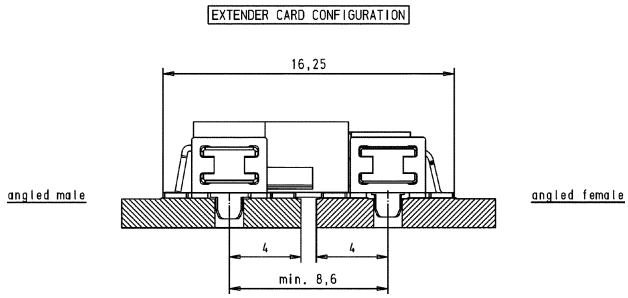
### Mezzanine connection



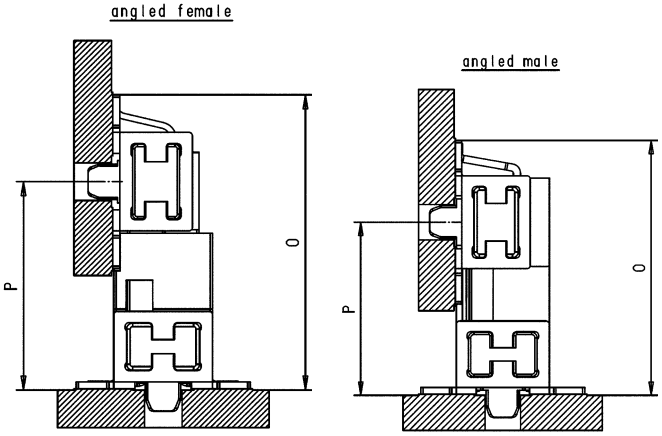

| | | | |
|---|---|---|---|
| 4.85 | 13.65 | 18.50 | 20.00 |
| 3.25 | 13.65 | 16.90 | 18.40 |
| 1.75 | 13.65 | 15.40 | 16.90 |
| 4.85 | 9.05 | 13.90 | 15.40 |
| 3.25 | 9.05 | 12.30 | 13.80 |
| 1.75 | 9.05 | 10.80 | 12.30 |
| 4.85 | 6.25 | 11.10 | 12.60 |
| 3.25 | 6.25 | 9.50 | 11.00 |
| 1.75 | 6.25 | 8.00 | 9.50 |
| X | Y | $S_{min}$ | $*S_{max}$ |

$*S_{max}$ = $S_{min}$ + 1.5 mm wiping length with additional contact overlap security

### Extender Card connection




### Mother-to-Daughtercard connection




| | | |
|---|---|---|
| 4.85 | 11.85 | 15.68 |
| 3.25 | 10.25 | 14.08 |
| 1.75 | 8.75 | 12.58 |
| X | $P_{min}$ | O |

| | | |
|---|---|---|
| 13.65 | 15.10 | 18.93 |
| 9.05 | 10.50 | 14.33 |
| 6.25 | 7.70 | 11.53 |
| Y | $P_{min}$ | O |



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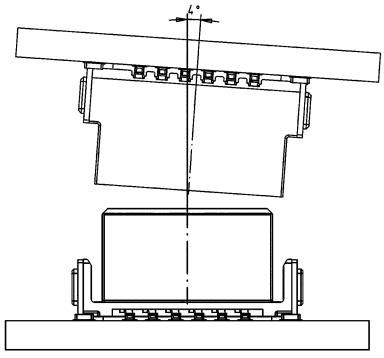
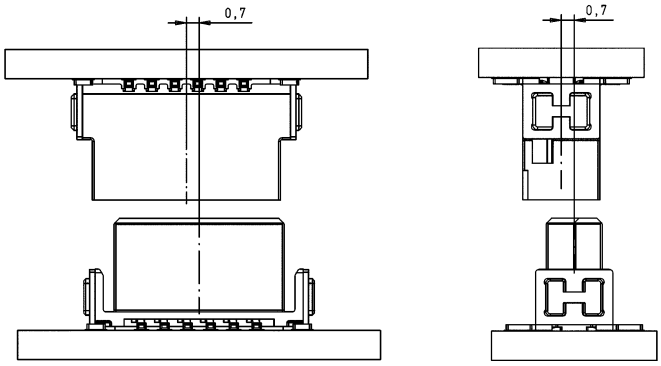
## Mating conditions

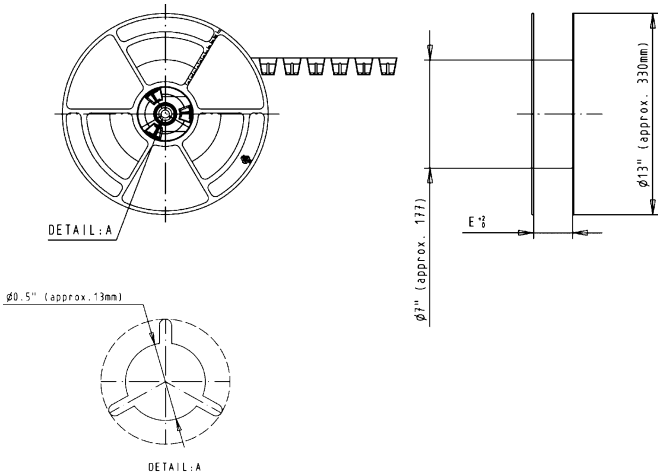
Inclination




Mismating

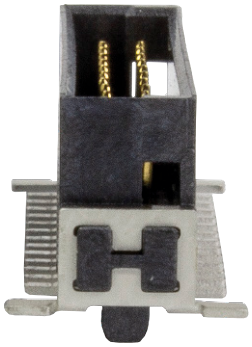



## Tape acc. to IEC 60 286-3




| Tape dimensions: | E |
|---|---|
| poles 6 to 12 | 24.4 |
| poles 14 to 20 | 32.4 |
| poles 22 to 40 | 44.4 |
| poles 42 to 56 | 56.4 |
| poles 58 to 80 | 72.4 |
| poles 82 to 100 | 88.4 |

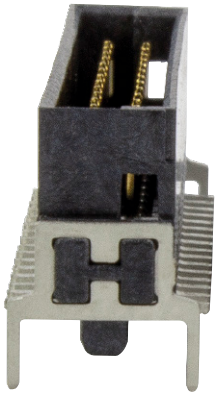
## Processing notes



The *har*-flex® SMT/THR connectors meet the highest demands in terms of their processing capabilities.

The connectors are delivered in a tape and reel packaging optimized for automatic assembly machines. A vacuum cover enables the automatic assembly with a vacuum nozzle.

The insulation body material is high temperature resistant, and due to the black colour a secure camera recognition is ensured.



To ensure a reliable reflow soldering process, the signal pins are 100 % checked for coplanarity.

## Process / Moisture Sensitivity

During the reflow solder process, the connector has to resist extreme variations in temperature. Connectors consist in general of both plastic and metal parts, which have a different behaviour during the solder process. The Process Sensivity and also the Moisture Sensivity are tested according the ECA/IPC/JEDEC J-STD-075 specification.

*Process Sensivity:*

**PSL** means Process Sensitivity Level. PSL is a rating used to identify a component that is solder process sensitive. Damages of the connector after three times soldering are not permitted (e.g. melted edges).

*Moisture Sensitivity:*

**MSL** means Moisture Sensitivity Level. MSL is a rating indicating a component's susceptibility to damage due to absorbed moisture during storage. Damages of the connector after storage in damp heat and three times soldering are not permitted (e.g. blisters).

The *har*-flex® connectors are rated with **PSL R0** and **MSL 1**. This is the maximum possible rating in both categories. The *har*-flex® connector resists three times soldering at the following conditions without damages:

- min. 150 s beyond 217 °C (liquidus temperature, the melting point of the solder paste)
- min. 30 s beyond classification temperature (240 °C / 245 °C for *har*-flex®)
- Temperature solder profile according to ECA/IPC/JEDEC J-STD-075
- For MSL test, a storage of 168 hours at 85 °C and 85 % rel. humidity was carried out

As the result, the *har*-flex® connectors are not process sensitive and not moisture sensitive according to ECA/IPC/JEDEC J-STD-075.



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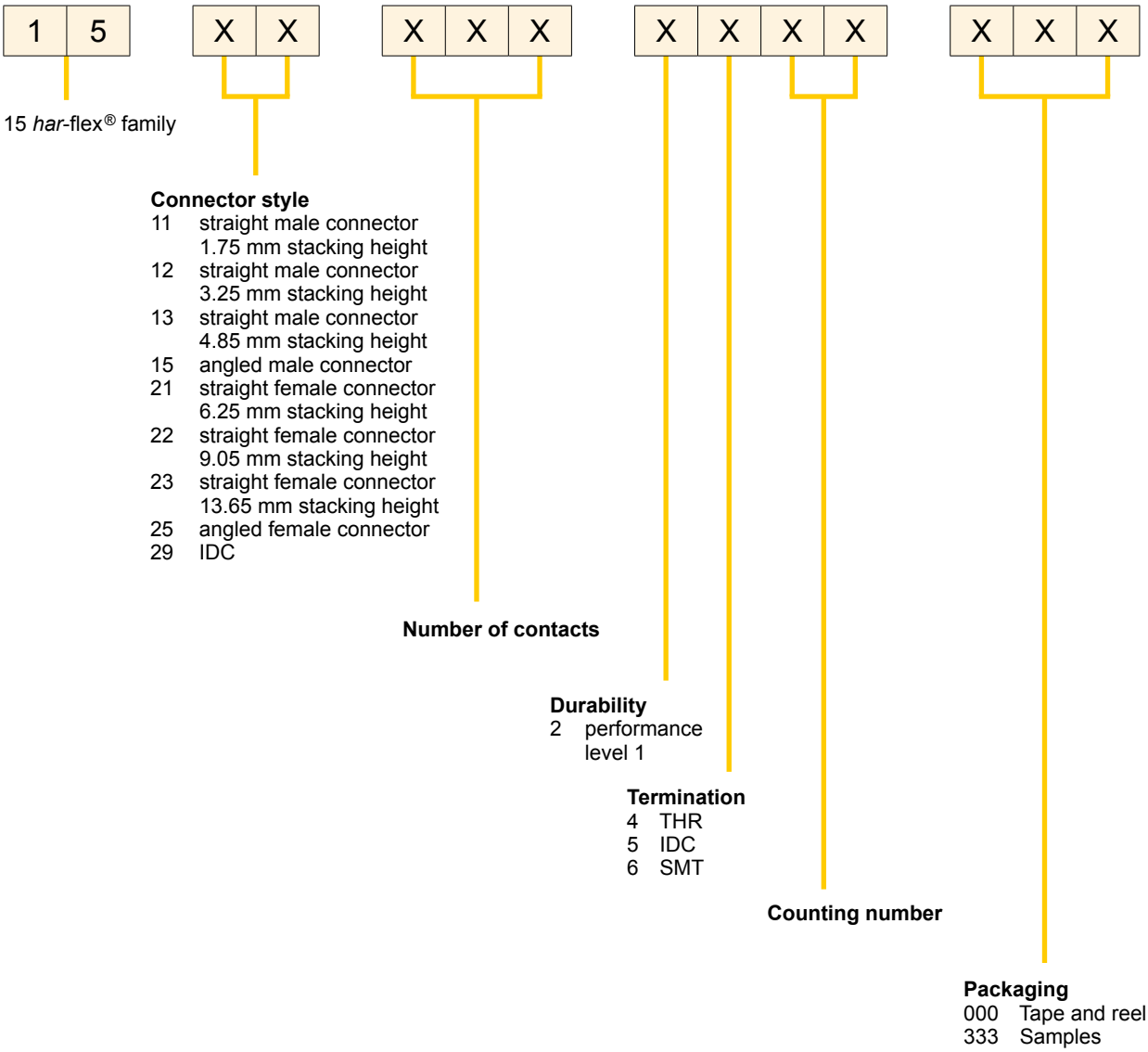
## Part number definition

The *har*-flex® part numbers have 14 digits and are based on the following scheme:





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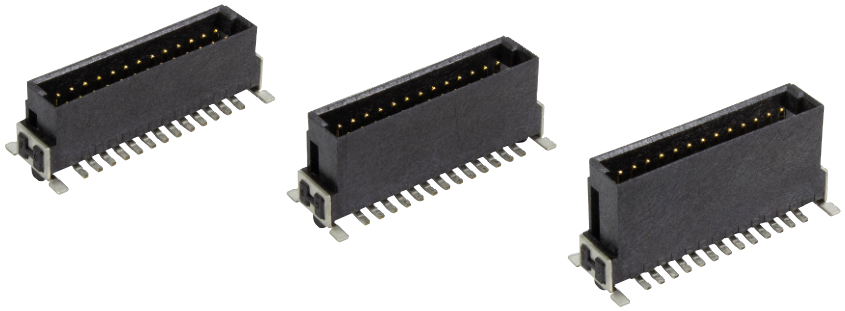

# Male connectors, straight, SMT

| Identification | No. of contacts | Part number |
|---|---|---|
| Male connector, straight, SMT<br>stacking heights<br>1.75 mm / 3.25 mm / 4.85 mm | 6 | 15 1 . 006 2601 . . . |
| | 8 | 15 1 . 008 2601 . . . |
| | 10 | 15 1 . 010 2601 . . . |
| | 12 | 15 1 . 012 2601 . . . |
| | 14 | 15 1 . 014 2601 . . . |
| | 16 | 15 1 . 016 2601 . . . |
| | 18 | 15 1 . 018 2601 . . . |
| | 20 | 15 1 . 020 2601 . . . |
| | 22 | 15 1 . 022 2601 . . . |
| | 24 | 15 1 . 024 2601 . . . |
| | 26 | 15 1 . 026 2601 . . . |
| | 28 | 15 1 . 028 2601 . . . |
| | 30 | 15 1 . 030 2601 . . . |
| | 32 | 15 1 . 032 2601 . . . |
| | 34 | 15 1 . 034 2601 . . . |
| | 36 | 15 1 . 036 2601 . . . |
| | 38 | 15 1 . 038 2601 . . . |
| | 40 | 15 1 . 040 2601 . . . |
| | 42 | 15 1 . 042 2601 . . . |
| | 44 | 15 1 . 044 2601 . . . |
| | 46 | 15 1 . 046 2601 . . . |
| | 48 | 15 1 . 048 2601 . . . |
| | 50 | 15 1 . 050 2601 . . . |
| | 52 | 15 1 . 052 2601 . . . |
| | 54 | 15 1 . 054 2601 . . . |
| | 56 | 15 1 . 056 2601 . . . |
| | 58 | 15 1 . 058 2601 . . . |
| | 60 | 15 1 . 060 2601 . . . |
| | 62 | 15 1 . 062 2601 . . . |
| | 64 | 15 1 . 064 2601 . . . |
| | 66 | 15 1 . 066 2601 . . . |
| | 68 | 15 1 . 068 2601 . . . |
| | 70 | 15 1 . 070 2601 . . . |
| | 72 | 15 1 . 072 2601 . . . |
| | 74 | 15 1 . 074 2601 . . . |
| | 76 | 15 1 . 076 2601 . . . |
| | 78 | 15 1 . 078 2601 . . . |
| | 80 | 15 1 . 080 2601 . . . |
| | 82 | 15 1 . 082 2601 . . . |
| | 84 | 15 1 . 084 2601 . . . |
| | 86 | 15 1 . 086 2601 . . . |
| | 88 | 15 1 . 088 2601 . . . |
| | 90 | 15 1 . 090 2601 . . . |
| | 92 | 15 1 . 092 2601 . . . |
| Please insert digit for stacking height | 94 | 15 1 . 094 2601 . . . |
| | 96 | 15 1 . 096 2601 . . . |
| 1.75 mm ▶ 1 | 98 | 15 1 . 098 2601 . . . |
| 3.25 mm ▶ 2 | 100 | 15 1 . 100 2601 . . . |
| 4.85 mm ▶ 3 | | |

Dimensions in mm

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 2.54 | 6.96 | 8.89 | 5.76 | 4.76 | 6.56 | 1.05 |
| 3.81 | 8.23 | 10.16 | 7.03 | 6.03 | 7.83 | 1.69 |
| 5.08 | 9.50 | 11.43 | 8.30 | 7.30 | 9.10 | 2.32 |
| 6.35 | 10.77 | 12.70 | 9.57 | 8.57 | 10.37 | 2.96 |
| 7.62 | 12.04 | 13.97 | 10.84 | 9.84 | 11.64 | 3.59 |
| 8.89 | 13.31 | 15.24 | 12.11 | 11.11 | 12.91 | 4.23 |
| 10.16 | 14.58 | 16.51 | 13.38 | 12.38 | 14.18 | 4.48 |
| 11.43 | 15.85 | 17.78 | 14.65 | 13.65 | 15.45 | 5.50 |
| 12.70 | 17.12 | 19.05 | 15.92 | 14.92 | 16.72 | 6.13 |
| 13.97 | 18.39 | 20.32 | 17.19 | 16.19 | 17.99 | 6.77 |
| 15.24 | 19.66 | 21.59 | 18.46 | 17.46 | 19.26 | 7.40 |
| 16.51 | 20.93 | 22.86 | 19.73 | 18.73 | 20.53 | 8.04 |
| 17.78 | 22.20 | 24.13 | 21.00 | 20.00 | 21.80 | 8.67 |
| 19.05 | 23.47 | 25.40 | 22.27 | 21.27 | 23.07 | 9.31 |
| 20.32 | 24.74 | 26.67 | 23.54 | 22.54 | 24.34 | 9.94 |
| 21.59 | 26.01 | 27.94 | 24.81 | 23.81 | 25.61 | 10.58 |
| 22.86 | 27.28 | 29.21 | 26.08 | 25.08 | 26.88 | 11.21 |
| 24.13 | 28.55 | 30.48 | 27.35 | 26.35 | 28.15 | 11.85 |
| 25.40 | 29.82 | 31.75 | 28.62 | 27.62 | 29.42 | 12.48 |
| 26.67 | 31.09 | 33.02 | 29.89 | 28.89 | 30.69 | 13.12 |
| 27.94 | 32.36 | 34.29 | 31.16 | 30.16 | 31.96 | 13.75 |
| 29.21 | 33.63 | 35.56 | 32.43 | 31.43 | 33.23 | 14.39 |
| 30.48 | 34.90 | 36.83 | 33.70 | 32.70 | 34.50 | 15.02 |
| 31.75 | 36.17 | 38.10 | 34.97 | 33.97 | 35.77 | 15.66 |
| 33.02 | 37.44 | 39.37 | 36.24 | 35.24 | 37.04 | 16.29 |
| 34.29 | 38.71 | 40.64 | 37.51 | 36.51 | 38.31 | 16.93 |
| 35.56 | 39.98 | 41.91 | 38.78 | 37.78 | 39.58 | 17.56 |
| 36.83 | 41.25 | 43.18 | 40.05 | 39.05 | 40.85 | 18.20 |
| 38.10 | 42.52 | 44.45 | 41.32 | 40.32 | 42.12 | 18.83 |
| 39.37 | 43.79 | 45.72 | 42.59 | 41.59 | 43.39 | 19.47 |
| 40.64 | 45.06 | 46.99 | 43.86 | 42.86 | 44.66 | 20.10 |
| 41.91 | 46.33 | 48.26 | 45.13 | 44.13 | 45.93 | 20.74 |
| 43.18 | 47.60 | 49.53 | 46.40 | 45.40 | 47.20 | 21.37 |
| 44.45 | 48.87 | 50.80 | 47.67 | 46.67 | 48.47 | 22.01 |
| 45.72 | 50.14 | 52.07 | 48.94 | 47.94 | 49.74 | 22.64 |
| 46.99 | 51.41 | 53.34 | 50.21 | 49.21 | 51.01 | 23.28 |
| 48.26 | 52.68 | 54.61 | 51.48 | 50.48 | 52.28 | 23.91 |
| 49.53 | 53.95 | 55.88 | 52.75 | 51.75 | 53.55 | 24.55 |
| 50.80 | 55.22 | 57.15 | 54.02 | 53.02 | 54.82 | 25.18 |
| 52.07 | 56.49 | 58.42 | 55.29 | 54.29 | 56.09 | 25.82 |
| 53.34 | 57.76 | 59.69 | 56.56 | 55.56 | 57.36 | 26.45 |
| 54.61 | 59.03 | 60.96 | 57.83 | 56.83 | 58.63 | 27.09 |
| 55.88 | 60.30 | 62.23 | 59.10 | 58.10 | 59.90 | 27.72 |
| 57.15 | 61.57 | 63.50 | 60.37 | 59.37 | 61.17 | 28.36 |
| 58.42 | 62.84 | 64.77 | 61.64 | 60.64 | 62.44 | 28.99 |
| 59.69 | 64.11 | 66.04 | 62.91 | 61.91 | 63.71 | 29.63 |
| 60.96 | 65.38 | 67.31 | 64.18 | 63.18 | 64.98 | 30.26 |
| 62.23 | 66.65 | 68.58 | 65.45 | 64.45 | 66.25 | 30.90 |

333 000 for samples
for 280 pieces on reel (250 pcs. for 4.85 mm stacking height)



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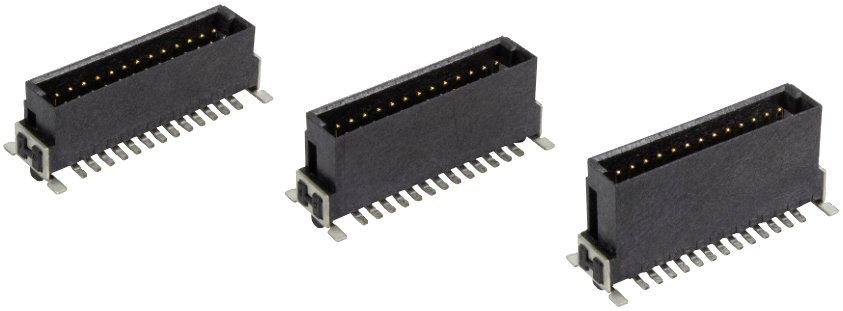
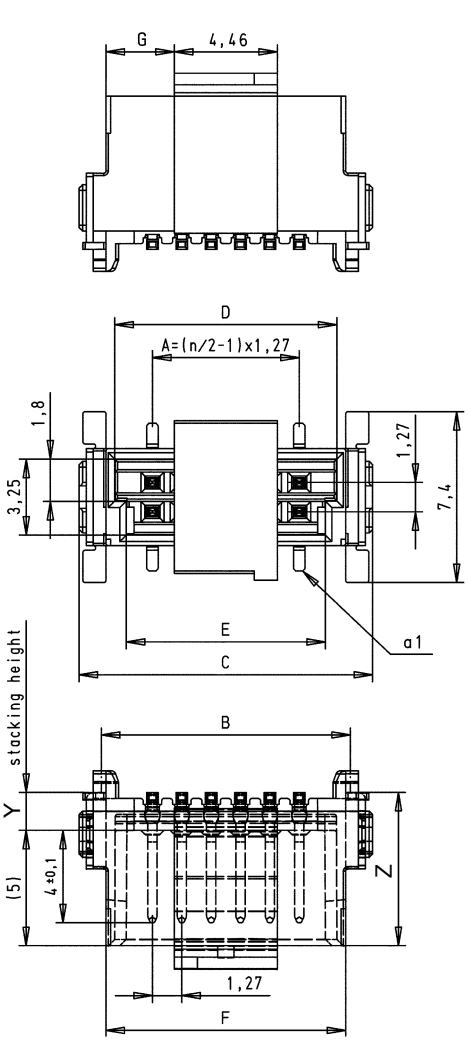
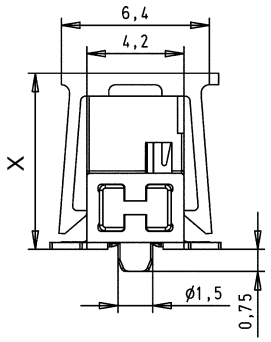


# Male connectors, straight, SMT

| Identification | Drawing | Dimensions in mm |
|---|---|---|

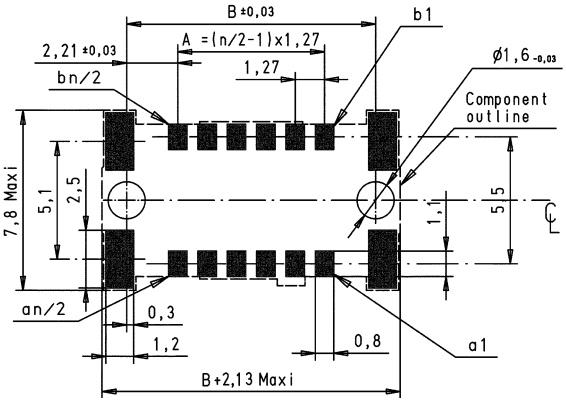
## Dimensions




| stacking height Y | height with vacuum cover X | unmated height Z |
|---|---|---|
| 1.75 | 7.6 | 6.6 |
| 3.25 | 9.1 | 8.1 |
| 4.85 | 10.7 | 9.7 |

## PCB layout



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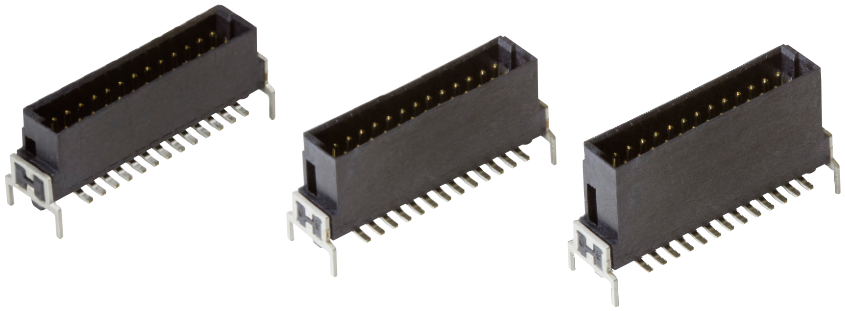

# Male connectors, straight, THR

| Identification | No. of contacts | Part number | Dimensions in mm |
|---|---|---|---|

Male connector, straight, THR
stacking heights
1.75 mm / 3.25 mm / 4.85 mm

| No. of contacts | Part number |
|---|---|
| 6 | 15 1 . 006 2401 . . . |
| 8 | 15 1 . 008 2401 . . . |
| 10 | 15 1 . 010 2401 . . . |
| 12 | 15 1 . 012 2401 . . . |
| 14 | 15 1 . 014 2401 . . . |
| 16 | 15 1 . 016 2401 . . . |
| 18 | 15 1 . 018 2401 . . . |
| 20 | 15 1 . 020 2401 . . . |
| 22 | 15 1 . 022 2401 . . . |
| 24 | 15 1 . 024 2401 . . . |
| 26 | 15 1 . 026 2401 . . . |
| 28 | 15 1 . 028 2401 . . . |
| 30 | 15 1 . 030 2401 . . . |
| 32 | 15 1 . 032 2401 . . . |
| 34 | 15 1 . 034 2401 . . . |
| 36 | 15 1 . 036 2401 . . . |
| 38 | 15 1 . 038 2401 . . . |
| 40 | 15 1 . 040 2401 . . . |
| 42 | 15 1 . 042 2401 . . . |
| 44 | 15 1 . 044 2401 . . . |
| 46 | 15 1 . 046 2401 . . . |
| 48 | 15 1 . 048 2401 . . . |
| 50 | 15 1 . 050 2401 . . . |
| 52 | 15 1 . 052 2401 . . . |
| 54 | 15 1 . 054 2401 . . . |
| 56 | 15 1 . 056 2401 . . . |
| 58 | 15 1 . 058 2401 . . . |
| 60 | 15 1 . 060 2401 . . . |
| 62 | 15 1 . 062 2401 . . . |
| 64 | 15 1 . 064 2401 . . . |
| 66 | 15 1 . 066 2401 . . . |
| 68 | 15 1 . 068 2401 . . . |
| 70 | 15 1 . 070 2401 . . . |
| 72 | 15 1 . 072 2401 . . . |
| 74 | 15 1 . 074 2401 . . . |
| 76 | 15 1 . 076 2401 . . . |
| 78 | 15 1 . 078 2401 . . . |
| 80 | 15 1 . 080 2401 . . . |
| 82 | 15 1 . 082 2401 . . . |
| 84 | 15 1 . 084 2401 . . . |
| 86 | 15 1 . 086 2401 . . . |
| 88 | 15 1 . 088 2401 . . . |
| 90 | 15 1 . 090 2401 . . . |
| 92 | 15 1 . 092 2401 . . . |
| 94 | 15 1 . 094 2401 . . . |
| 96 | 15 1 . 096 2401 . . . |
| 98 | 15 1 . 098 2401 . . . |
| 100 | 15 1 . 100 2401 . . . |

Please insert digit for stacking height

1.75 mm ▶ 1
3.25 mm ▶ 2
4.85 mm ▶ 3

| A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|
| 2.54 | 6.96 | 8.89 | 5.76 | 4.76 | 6.56 | 1.05 |
| 3.81 | 8.23 | 10.16 | 7.03 | 6.03 | 7.83 | 1.69 |
| 5.08 | 9.50 | 11.43 | 8.30 | 7.30 | 9.10 | 2.32 |
| 6.35 | 10.77 | 12.70 | 9.57 | 8.57 | 10.37 | 2.96 |
| 7.62 | 12.04 | 13.97 | 10.84 | 9.84 | 11.64 | 3.59 |
| 8.89 | 13.31 | 15.24 | 12.11 | 11.11 | 12.91 | 4.23 |
| 10.16 | 14.58 | 16.51 | 13.38 | 12.38 | 14.18 | 4.48 |
| 11.43 | 15.85 | 17.78 | 14.65 | 13.65 | 15.45 | 5.50 |
| 12.70 | 17.12 | 19.05 | 15.92 | 14.92 | 16.72 | 6.13 |
| 13.97 | 18.39 | 20.32 | 17.19 | 16.19 | 17.99 | 6.77 |
| 15.24 | 19.66 | 21.59 | 18.46 | 17.46 | 19.26 | 7.40 |
| 16.51 | 20.93 | 22.86 | 19.73 | 18.73 | 20.53 | 8.04 |
| 17.78 | 22.20 | 24.13 | 21.00 | 20.00 | 21.80 | 8.67 |
| 19.05 | 23.47 | 25.40 | 22.27 | 21.27 | 23.07 | 9.31 |
| 20.32 | 24.74 | 26.67 | 23.54 | 22.54 | 24.34 | 9.94 |
| 21.59 | 26.01 | 27.94 | 24.81 | 23.81 | 25.61 | 10.58 |
| 22.86 | 27.28 | 29.21 | 26.08 | 25.08 | 26.88 | 11.21 |
| 24.13 | 28.55 | 30.48 | 27.35 | 26.35 | 28.15 | 11.85 |
| 25.40 | 29.82 | 31.75 | 28.62 | 27.62 | 29.42 | 12.48 |
| 26.67 | 31.09 | 33.02 | 29.89 | 28.89 | 30.69 | 13.12 |
| 27.94 | 32.36 | 34.29 | 31.16 | 30.16 | 31.96 | 13.75 |
| 29.21 | 33.63 | 35.56 | 32.43 | 31.43 | 33.23 | 14.39 |
| 30.48 | 34.90 | 36.83 | 33.70 | 32.70 | 34.50 | 15.02 |
| 31.75 | 36.17 | 38.10 | 34.97 | 33.97 | 35.77 | 15.66 |
| 33.02 | 37.44 | 39.37 | 36.24 | 35.24 | 37.04 | 16.29 |
| 34.29 | 38.71 | 40.64 | 37.51 | 36.51 | 38.31 | 16.93 |
| 35.56 | 39.98 | 41.91 | 38.78 | 37.78 | 39.58 | 17.56 |
| 36.83 | 41.25 | 43.18 | 40.05 | 39.05 | 40.85 | 18.20 |
| 38.10 | 42.52 | 44.45 | 41.32 | 40.32 | 42.12 | 18.83 |
| 39.37 | 43.79 | 45.72 | 42.59 | 41.59 | 43.39 | 19.47 |
| 40.64 | 45.06 | 46.99 | 43.86 | 42.86 | 44.66 | 20.10 |
| 41.91 | 46.33 | 48.26 | 45.13 | 44.13 | 45.93 | 20.74 |
| 43.18 | 47.60 | 49.53 | 46.40 | 45.40 | 47.20 | 21.37 |
| 44.45 | 48.87 | 50.80 | 47.67 | 46.67 | 48.47 | 22.01 |
| 45.72 | 50.14 | 52.07 | 48.94 | 47.94 | 49.74 | 22.64 |
| 46.99 | 51.41 | 53.34 | 50.21 | 49.21 | 51.01 | 23.28 |
| 48.26 | 52.68 | 54.61 | 51.48 | 50.48 | 52.28 | 23.91 |
| 49.53 | 53.95 | 55.88 | 52.75 | 51.75 | 53.55 | 24.55 |
| 50.80 | 55.22 | 57.15 | 54.02 | 53.02 | 54.82 | 25.18 |
| 52.07 | 56.49 | 58.42 | 55.29 | 54.29 | 56.09 | 25.82 |
| 53.34 | 57.76 | 59.69 | 56.56 | 55.56 | 57.36 | 26.45 |
| 54.61 | 59.03 | 60.96 | 57.83 | 56.83 | 58.63 | 27.09 |
| 55.88 | 60.30 | 62.23 | 59.10 | 58.10 | 59.90 | 27.72 |
| 57.15 | 61.57 | 63.50 | 60.37 | 59.37 | 61.17 | 28.36 |
| 58.42 | 62.84 | 64.77 | 61.64 | 60.64 | 62.44 | 28.99 |
| 59.69 | 64.11 | 66.04 | 62.91 | 61.91 | 63.71 | 29.63 |
| 60.96 | 65.38 | 67.31 | 64.18 | 63.18 | 64.98 | 30.26 |
| 62.23 | 66.65 | 68.58 | 65.45 | 64.45 | 66.25 | 30.90 |

333 000 for samples
for 280 pieces on reel (250 pcs. for 4.85 mm stacking height)



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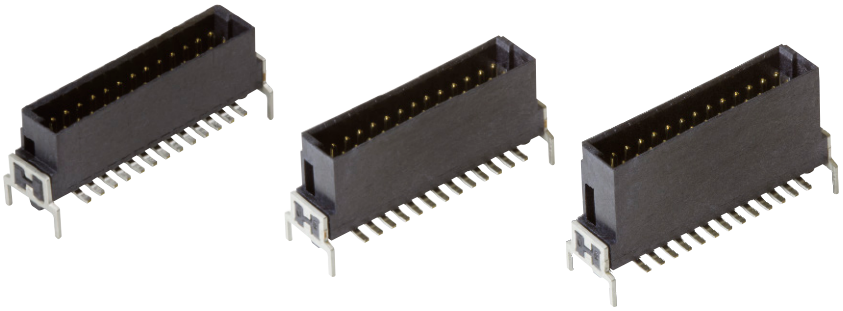
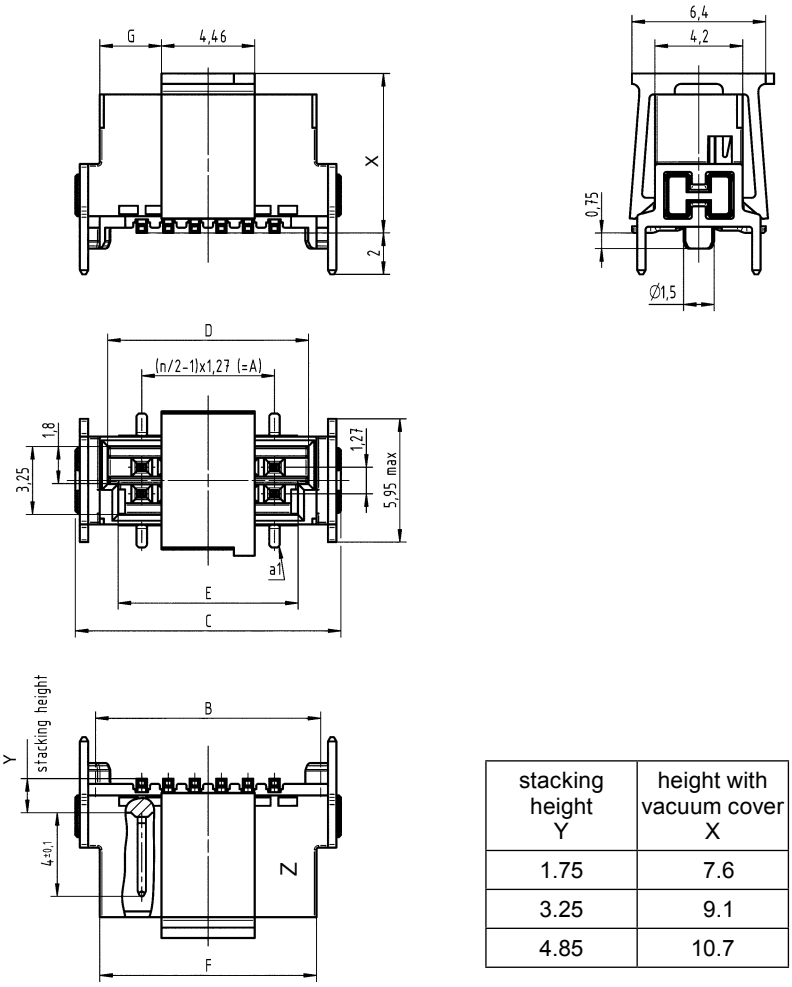


# Male connectors, straight, THR

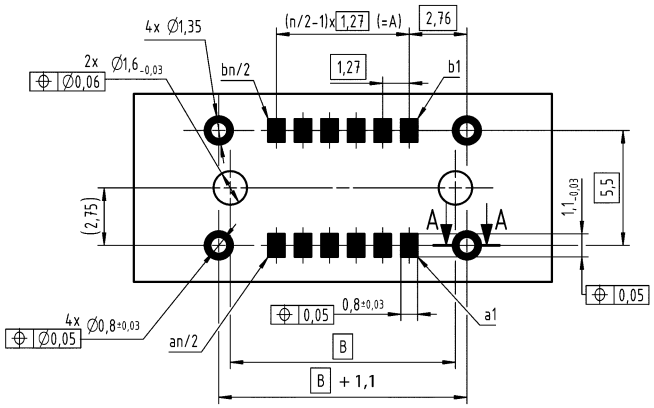
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Dimensions




| stacking height Y | height with vacuum cover X |
|---|---|
| 1.75 | 7.6 |
| 3.25 | 9.1 |
| 4.85 | 10.7 |

## PCB layout





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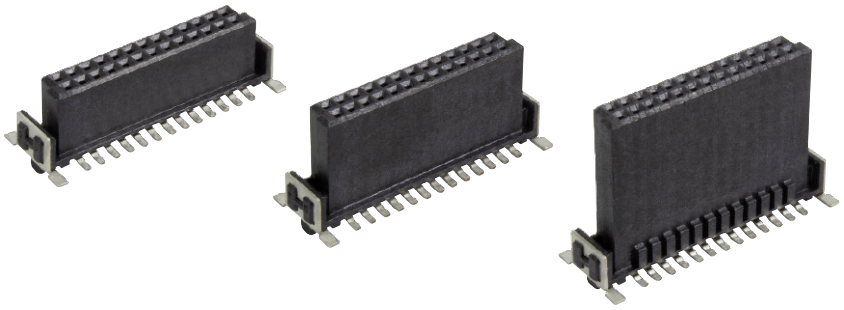


## Female connectors, straight, SMT

| Identification | No. of contacts | Part number | Dimensions in mm |
|---|---|---|---|

Female connector, straight, SMT
stacking heights
6.25 / 9.05 / 13.65 mm

| No. of contacts | Part number |
|---|---|
| 6 | 15 2 . 006 2601 . . . |
| 8 | 15 2 . 008 2601 . . . |
| 10 | 15 2 . 010 2601 . . . |
| 12 | 15 2 . 012 2601 . . . |
| 14 | 15 2 . 014 2601 . . . |
| 16 | 15 2 . 016 2601 . . . |
| 18 | 15 2 . 018 2601 . . . |
| 20 | 15 2 . 020 2601 . . . |
| 22 | 15 2 . 022 2601 . . . |
| 24 | 15 2 . 024 2601 . . . |
| 26 | 15 2 . 026 2601 . . . |
| 28 | 15 2 . 028 2601 . . . |
| 30 | 15 2 . 030 2601 . . . |
| 32 | 15 2 . 032 2601 . . . |
| 34 | 15 2 . 034 2601 . . . |
| 36 | 15 2 . 036 2601 . . . |
| 38 | 15 2 . 038 2601 . . . |
| 40 | 15 2 . 040 2601 . . . |
| 42 | 15 2 . 042 2601 . . . |
| 44 | 15 2 . 044 2601 . . . |
| 46 | 15 2 . 046 2601 . . . |
| 48 | 15 2 . 048 2601 . . . |
| 50 | 15 2 . 050 2601 . . . |
| 52 | 15 2 . 052 2601 . . . |
| 54 | 15 2 . 054 2601 . . . |
| 56 | 15 2 . 056 2601 . . . |
| 58 | 15 2 . 058 2601 . . . |
| 60 | 15 2 . 060 2601 . . . |
| 62 | 15 2 . 062 2601 . . . |
| 64 | 15 2 . 064 2601 . . . |
| 66 | 15 2 . 066 2601 . . . |
| 68 | 15 2 . 068 2601 . . . |
| 70 | 15 2 . 070 2601 . . . |
| 72 | 15 2 . 072 2601 . . . |
| 74 | 15 2 . 074 2601 . . . |
| 76 | 15 2 . 076 2601 . . . |
| 78 | 15 2 . 078 2601 . . . |
| 80 | 15 2 . 080 2601 . . . |
| 82 | 15 2 . 082 2601 . . . |
| 84 | 15 2 . 084 2601 . . . |
| 86 | 15 2 . 086 2601 . . . |
| 88 | 15 2 . 088 2601 . . . |
| 90 | 15 2 . 090 2601 . . . |
| 92 | 15 2 . 092 2601 . . . |
| 94 | 15 2 . 094 2601 . . . |
| 96 | 15 2 . 096 2601 . . . |
| 98 | 15 2 . 098 2601 . . . |
| 100 | 15 2 . 100 2601 . . . |

Please insert digit
for stacking height

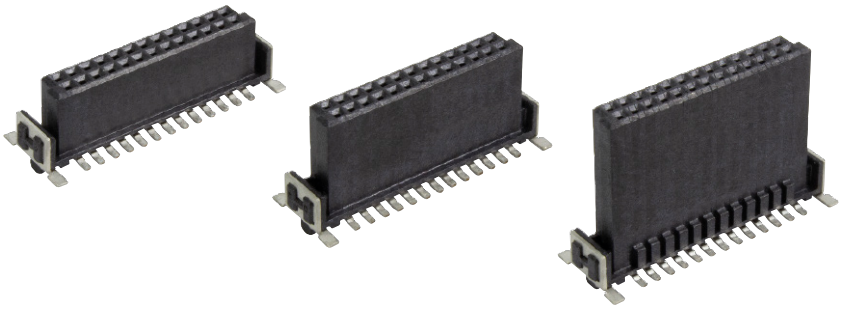
6.25 mm ▶ 1
9.05 mm ▶ 2
13.65 mm ▶ 3

| A | B | C | D | E | G |
|---|---|---|---|---|---|
| 2.54 | 6.96 | 8.89 | 5.56 | 4.56 | 1.19 |
| 3.81 | 8.23 | 10.16 | 6.83 | 5.83 | 1.19 |
| 5.08 | 9.50 | 11.43 | 8.10 | 7.10 | 2.46 |
| 6.35 | 10.77 | 12.70 | 9.37 | 8.37 | 2.46 |
| 7.62 | 12.04 | 13.97 | 10.64 | 9.64 | 3.73 |
| 8.89 | 13.31 | 15.24 | 11.91 | 10.91 | 3.73 |
| 10.16 | 14.58 | 16.51 | 13.18 | 12.18 | 5.00 |
| 11.43 | 15.85 | 17.78 | 14.45 | 13.45 | 5.00 |
| 12.70 | 17.12 | 19.05 | 15.72 | 14.72 | 6.27 |
| 13.97 | 18.39 | 20.32 | 16.99 | 15.99 | 6.27 |
| 15.24 | 19.66 | 21.59 | 18.26 | 17.26 | 7.54 |
| 16.51 | 20.93 | 22.86 | 19.53 | 18.53 | 7.54 |
| 17.78 | 22.20 | 24.13 | 20.80 | 19.80 | 8.81 |
| 19.05 | 23.47 | 25.40 | 22.07 | 21.07 | 8.81 |
| 20.32 | 24.74 | 26.67 | 23.34 | 22.34 | 10.08 |
| 21.59 | 26.01 | 27.94 | 24.61 | 23.61 | 10.08 |
| 22.86 | 27.28 | 29.21 | 25.88 | 24.88 | 11.35 |
| 24.13 | 28.55 | 30.48 | 27.15 | 26.15 | 11.35 |
| 25.40 | 29.82 | 31.75 | 28.42 | 27.42 | 12.62 |
| 26.67 | 31.09 | 33.02 | 29.69 | 28.69 | 12.62 |
| 27.94 | 32.36 | 34.29 | 30.96 | 29.96 | 13.89 |
| 29.21 | 33.63 | 35.56 | 32.23 | 31.23 | 13.89 |
| 30.48 | 34.90 | 36.83 | 33.50 | 32.50 | 15.16 |
| 31.75 | 36.17 | 38.10 | 34.77 | 33.77 | 15.16 |
| 33.02 | 37.44 | 39.37 | 36.04 | 35.04 | 16.43 |
| 34.29 | 38.71 | 40.64 | 37.31 | 36.31 | 16.43 |
| 35.56 | 39.98 | 41.91 | 38.58 | 37.58 | 17.70 |
| 36.83 | 41.25 | 43.18 | 39.85 | 38.85 | 17.70 |
| 38.10 | 42.52 | 44.45 | 41.12 | 40.12 | 18.97 |
| 39.37 | 43.79 | 45.72 | 42.39 | 41.39 | 18.97 |
| 40.64 | 45.06 | 46.99 | 43.66 | 42.66 | 20.24 |
| 41.91 | 46.33 | 48.26 | 44.93 | 43.93 | 20.24 |
| 43.18 | 47.60 | 49.53 | 46.20 | 45.20 | 21.51 |
| 44.45 | 48.87 | 50.80 | 47.47 | 46.47 | 21.51 |
| 45.72 | 50.14 | 52.07 | 48.74 | 47.74 | 22.78 |
| 46.99 | 51.41 | 53.34 | 50.01 | 49.01 | 22.78 |
| 48.26 | 52.68 | 54.61 | 51.28 | 50.28 | 24.05 |
| 49.53 | 53.95 | 55.88 | 52.55 | 51.55 | 24.05 |
| 50.80 | 55.22 | 57.15 | 53.82 | 52.82 | 25.32 |
| 52.07 | 56.49 | 58.42 | 55.09 | 54.09 | 25.32 |
| 53.34 | 57.76 | 59.69 | 56.36 | 55.36 | 26.59 |
| 54.61 | 59.03 | 60.96 | 57.63 | 56.63 | 26.59 |
| 55.88 | 60.30 | 62.23 | 58.90 | 57.90 | 27.86 |
| 57.15 | 61.57 | 63.50 | 60.17 | 59.17 | 27.86 |
| 58.42 | 62.84 | 64.77 | 61.44 | 60.44 | 29.13 |
| 59.69 | 64.11 | 66.04 | 62.71 | 61.71 | 29.13 |
| 60.96 | 65.38 | 67.31 | 63.98 | 62.98 | 30.40 |
| 62.23 | 66.65 | 68.58 | 65.25 | 64.25 | 30.40 |

333
000 for samples
for 280 pieces on reel (170 pcs. for 13.65 mm stacking height)



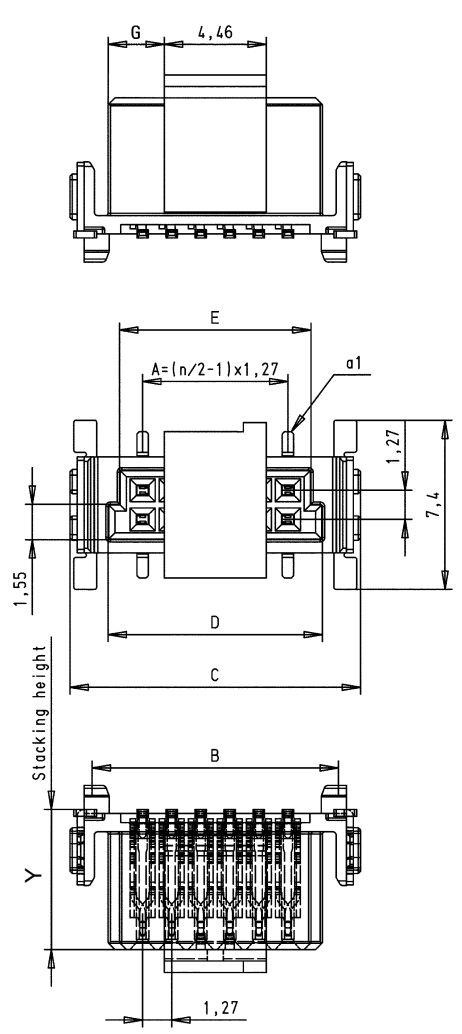
Downloaded from Arrow.com.

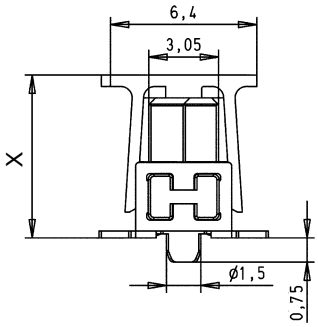


# Female connectors, straight, SMT

| Identification | Drawing | Dimensions in mm |
|---|---|---|

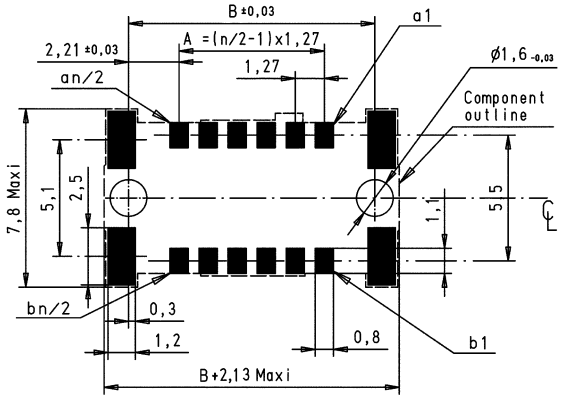
## Dimensions



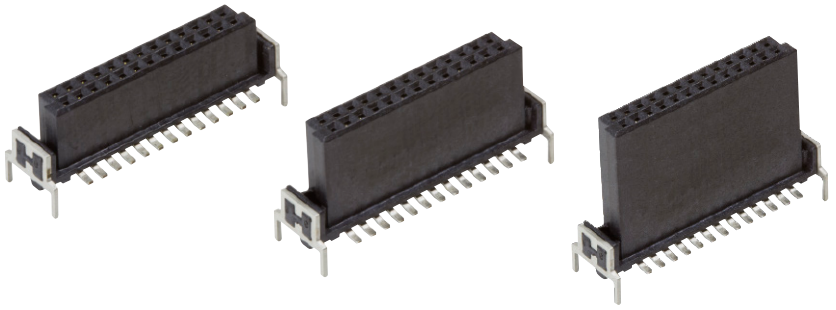

| stacking height Y | height with vacuum cover X |
|---|---|
| 6.25 | 7.1 |
| 9.05 | 9.9 |
| 13.65 | 14.5 |

## PCB layout






Downloaded from Arrow.com.



# Female connectors, straight, THR

| Identification | No. of contacts | Part number | Dimensions in mm |
|---|---|---|---|

Female connector, straight, THR
stacking heights
6.25 / 9.05 / 13.65 mm

| No. of contacts | Part number |
|---|---|
| 6 | 15 2 . 006 2401 . . . |
| 8 | 15 2 . 008 2401 . . . |
| 10 | 15 2 . 010 2401 . . . |
| 12 | 15 2 . 012 2401 . . . |
| 14 | 15 2 . 014 2401 . . . |
| 16 | 15 2 . 016 2401 . . . |
| 18 | 15 2 . 018 2401 . . . |
| 20 | 15 2 . 020 2401 . . . |
| 22 | 15 2 . 022 2401 . . . |
| 24 | 15 2 . 024 2401 . . . |
| 26 | 15 2 . 026 2401 . . . |
| 28 | 15 2 . 028 2401 . . . |
| 30 | 15 2 . 030 2401 . . . |
| 32 | 15 2 . 032 2401 . . . |
| 34 | 15 2 . 034 2401 . . . |
| 36 | 15 2 . 036 2401 . . . |
| 38 | 15 2 . 038 2401 . . . |
| 40 | 15 2 . 040 2401 . . . |
| 42 | 15 2 . 042 2401 . . . |
| 44 | 15 2 . 044 2401 . . . |
| 46 | 15 2 . 046 2401 . . . |
| 48 | 15 2 . 048 2401 . . . |
| 50 | 15 2 . 050 2401 . . . |
| 52 | 15 2 . 052 2401 . . . |
| 54 | 15 2 . 054 2401 . . . |
| 56 | 15 2 . 056 2401 . . . |
| 58 | 15 2 . 058 2401 . . . |
| 60 | 15 2 . 060 2401 . . . |
| 62 | 15 2 . 062 2401 . . . |
| 64 | 15 2 . 064 2401 . . . |
| 66 | 15 2 . 066 2401 . . . |
| 68 | 15 2 . 068 2401 . . . |
| 70 | 15 2 . 070 2401 . . . |
| 72 | 15 2 . 072 2401 . . . |
| 74 | 15 2 . 074 2401 . . . |
| 76 | 15 2 . 076 2401 . . . |
| 78 | 15 2 . 078 2401 . . . |
| 80 | 15 2 . 080 2401 . . . |
| 82 | 15 2 . 082 2401 . . . |
| 84 | 15 2 . 084 2401 . . . |
| 86 | 15 2 . 086 2401 . . . |
| 88 | 15 2 . 088 2401 . . . |
| 90 | 15 2 . 090 2401 . . . |
| 92 | 15 2 . 092 2401 . . . |
| 94 | 15 2 . 094 2401 . . . |
| 96 | 15 2 . 096 2401 . . . |
| 98 | 15 2 . 098 2401 . . . |
| 100 | 15 2 . 100 2401 . . . |

Please insert digit for stacking height

6.25 mm ▶ 1
9.05 mm ▶ 2
13.65 mm ▶ 3

| A | B | C | D | E | G |
|---|---|---|---|---|---|
| 2.54 | 6.96 | 8.89 | 5.56 | 4.56 | 1.19 |
| 3.81 | 8.23 | 10.16 | 6.83 | 5.83 | 1.19 |
| 5.08 | 9.50 | 11.43 | 8.10 | 7.10 | 2.46 |
| 6.35 | 10.77 | 12.70 | 9.37 | 8.37 | 2.46 |
| 7.62 | 12.04 | 13.97 | 10.64 | 9.64 | 3.73 |
| 8.89 | 13.31 | 15.24 | 11.91 | 10.91 | 3.73 |
| 10.16 | 14.58 | 16.51 | 13.18 | 12.18 | 5.00 |
| 11.43 | 15.85 | 17.78 | 14.45 | 13.45 | 5.00 |
| 12.70 | 17.12 | 19.05 | 15.72 | 14.72 | 6.27 |
| 13.97 | 18.39 | 20.32 | 16.99 | 15.99 | 6.27 |
| 15.24 | 19.66 | 21.59 | 18.26 | 17.26 | 7.54 |
| 16.51 | 20.93 | 22.86 | 19.53 | 18.53 | 7.54 |
| 17.78 | 22.20 | 24.13 | 20.80 | 19.80 | 8.81 |
| 19.05 | 23.47 | 25.40 | 22.07 | 21.07 | 8.81 |
| 20.32 | 24.74 | 26.67 | 23.34 | 22.34 | 10.08 |
| 21.59 | 26.01 | 27.94 | 24.61 | 23.61 | 10.08 |
| 22.86 | 27.28 | 29.21 | 25.88 | 24.88 | 11.35 |
| 24.13 | 28.55 | 30.48 | 27.15 | 26.15 | 11.35 |
| 25.40 | 29.82 | 31.75 | 28.42 | 27.42 | 12.62 |
| 26.67 | 31.09 | 33.02 | 29.69 | 28.69 | 12.62 |
| 27.94 | 32.36 | 34.29 | 30.96 | 29.96 | 13.89 |
| 29.21 | 33.63 | 35.56 | 32.23 | 31.23 | 13.89 |
| 30.48 | 34.90 | 36.83 | 33.50 | 32.50 | 15.16 |
| 31.75 | 36.17 | 38.10 | 34.77 | 33.77 | 15.16 |
| 33.02 | 37.44 | 39.37 | 36.04 | 35.04 | 16.43 |
| 34.29 | 38.71 | 40.64 | 37.31 | 36.31 | 16.43 |
| 35.56 | 39.98 | 41.91 | 38.58 | 37.58 | 17.70 |
| 36.83 | 41.25 | 43.18 | 39.85 | 38.85 | 17.70 |
| 38.10 | 42.52 | 44.45 | 41.12 | 40.12 | 18.97 |
| 39.37 | 43.79 | 45.72 | 42.39 | 41.39 | 18.97 |
| 40.64 | 45.06 | 46.99 | 43.66 | 42.66 | 20.24 |
| 41.91 | 46.33 | 48.26 | 44.93 | 43.93 | 20.24 |
| 43.18 | 47.60 | 49.53 | 46.20 | 45.20 | 21.51 |
| 44.45 | 48.87 | 50.80 | 47.47 | 46.47 | 21.51 |
| 45.72 | 50.14 | 52.07 | 48.74 | 47.74 | 22.78 |
| 46.99 | 51.41 | 53.34 | 50.01 | 49.01 | 22.78 |
| 48.26 | 52.68 | 54.61 | 51.28 | 50.28 | 24.05 |
| 49.53 | 53.95 | 55.88 | 52.55 | 51.55 | 24.05 |
| 50.80 | 55.22 | 57.15 | 53.82 | 52.82 | 25.32 |
| 52.07 | 56.49 | 58.42 | 55.09 | 54.09 | 25.32 |
| 53.34 | 57.76 | 59.69 | 56.36 | 55.36 | 26.59 |
| 54.61 | 59.03 | 60.96 | 57.63 | 56.63 | 26.59 |
| 55.88 | 60.30 | 62.23 | 58.90 | 57.90 | 27.86 |
| 57.15 | 61.57 | 63.50 | 60.17 | 59.17 | 27.86 |
| 58.42 | 62.84 | 64.77 | 61.44 | 60.44 | 29.13 |
| 59.69 | 64.11 | 66.04 | 62.71 | 61.71 | 29.13 |
| 60.96 | 65.38 | 67.31 | 63.98 | 62.98 | 30.40 |
| 62.23 | 66.65 | 68.58 | 65.25 | 64.25 | 30.40 |

333
000
for samples
for 280 pieces on reel (170 pcs. for 13.65 mm stacking height)



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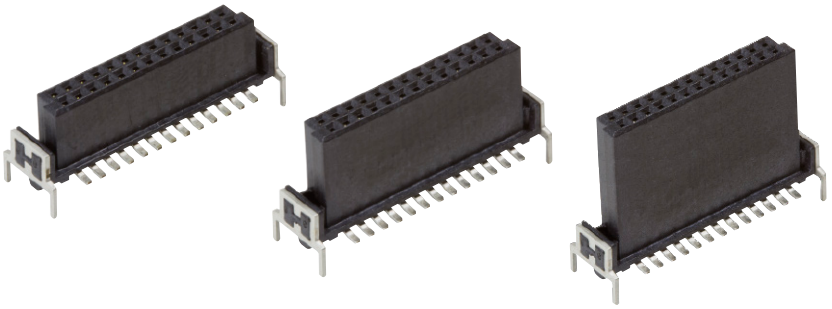
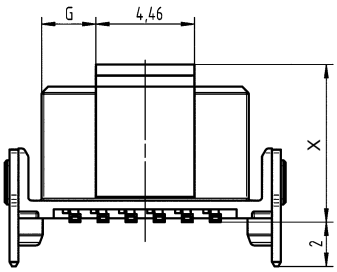
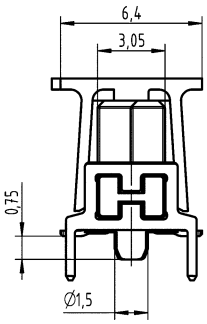


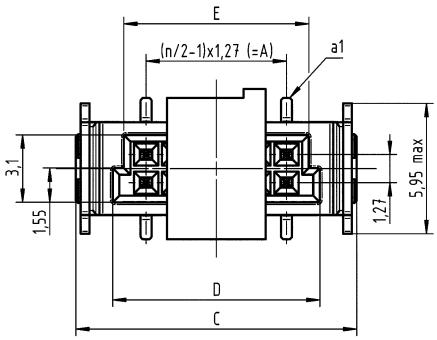
# Female connectors, straight, THR

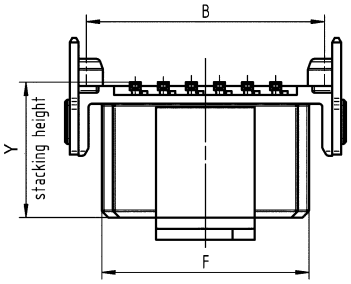
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Dimensions



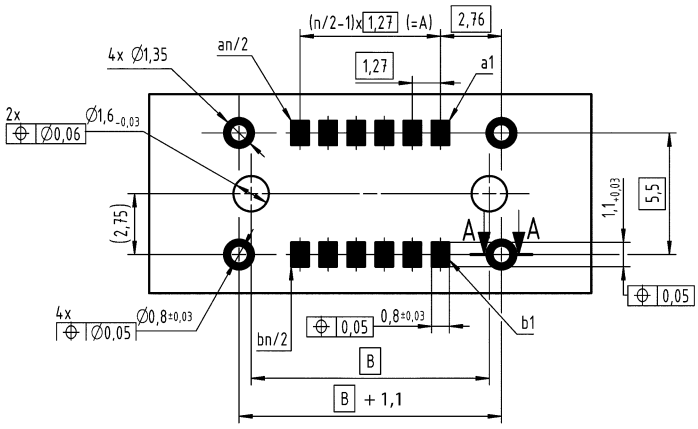




| stacking height Y | height with vacuum cover X |
|---|---|
| 6.25 | 7.1 |
| 9.05 | 9.9 |
| 13.65 | 14.5 |

## PCB layout



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## Male connectors, angled, SMT

| Identification | No. of contacts | Part number |
|---|---|---|
| Male connector, angled, SMT | 6 | 15 15 006 2601 . . . |
| | 8 | 15 15 008 2601 . . . |
| | 10 | 15 15 010 2601 . . . |
| | 12 | 15 15 012 2601 . . . |
| | 14 | 15 15 014 2601 . . . |
| | 16 | 15 15 016 2601 . . . |
| | 18 | 15 15 018 2601 . . . |
| | 20 | 15 15 020 2601 . . . |
| | 22 | 15 15 022 2601 . . . |
| | 24 | 15 15 024 2601 . . . |
| | 26 | 15 15 026 2601 . . . |
| | 28 | 15 15 028 2601 . . . |
| | 30 | 15 15 030 2601 . . . |
| | 32 | 15 15 032 2601 . . . |
| | 34 | 15 15 034 2601 . . . |
| | 36 | 15 15 036 2601 . . . |
| | 38 | 15 15 038 2601 . . . |
| | 40 | 15 15 040 2601 . . . |
| | 42 | 15 15 042 2601 . . . |
| | 44 | 15 15 044 2601 . . . |
| | 46 | 15 15 046 2601 . . . |
| | 48 | 15 15 048 2601 . . . |
| | 50 | 15 15 050 2601 . . . |
| | 52 | 15 15 052 2601 . . . |
| | 54 | 15 15 054 2601 . . . |
| | 56 | 15 15 056 2601 . . . |
| | 58 | 15 15 058 2601 . . . |
| | 60 | 15 15 060 2601 . . . |
| | 62 | 15 15 062 2601 . . . |
| | 64 | 15 15 064 2601 . . . |
| | 66 | 15 15 066 2601 . . . |
| | 68 | 15 15 068 2601 . . . |
| | 70 | 15 15 070 2601 . . . |
| | 72 | 15 15 072 2601 . . . |
| | 74 | 15 15 074 2601 . . . |
| | 76 | 15 15 076 2601 . . . |
| | 78 | 15 15 078 2601 . . . |
| | 80 | 15 15 080 2601 . . . |
| | 82 | 15 15 082 2601 . . . |
| | 84 | 15 15 084 2601 . . . |
| | 86 | 15 15 086 2601 . . . |
| | 88 | 15 15 088 2601 . . . |
| | 90 | 15 15 090 2601 . . . |
| | 92 | 15 15 092 2601 . . . |
| | 94 | 15 15 094 2601 . . . |
| | 96 | 15 15 096 2601 . . . |
| | 98 | 15 15 098 2601 . . . |
| | 100 | 15 15 100 2601 . . . |

Dimensions in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 2.54 | 6.96 | 8.89 | 5.76 | 4.76 |
| 3.81 | 8.23 | 10.16 | 7.03 | 6.03 |
| 5.08 | 9.50 | 11.43 | 8.30 | 7.30 |
| 6.35 | 10.77 | 12.70 | 9.57 | 8.57 |
| 7.62 | 12.04 | 13.97 | 10.84 | 9.84 |
| 8.89 | 13.31 | 15.24 | 12.11 | 11.11 |
| 10.16 | 14.58 | 16.51 | 13.38 | 12.38 |
| 11.43 | 15.85 | 17.78 | 14.65 | 13.65 |
| 12.70 | 17.12 | 19.05 | 15.92 | 14.92 |
| 13.97 | 18.39 | 20.32 | 17.19 | 16.19 |
| 15.24 | 19.66 | 21.59 | 18.46 | 17.46 |
| 16.51 | 20.93 | 22.86 | 19.73 | 18.73 |
| 17.78 | 22.20 | 24.13 | 21.00 | 20.00 |
| 19.05 | 23.47 | 25.40 | 22.27 | 21.27 |
| 20.32 | 24.74 | 26.67 | 23.54 | 22.54 |
| 21.59 | 26.01 | 27.94 | 24.81 | 23.81 |
| 22.86 | 27.28 | 29.21 | 26.08 | 25.08 |
| 24.13 | 28.55 | 30.48 | 27.35 | 26.35 |
| 25.40 | 29.82 | 31.75 | 28.62 | 27.62 |
| 26.67 | 31.09 | 33.02 | 29.89 | 28.89 |
| 27.94 | 32.36 | 34.29 | 31.16 | 30.16 |
| 29.21 | 33.63 | 35.56 | 32.43 | 31.43 |
| 30.48 | 34.90 | 36.83 | 33.70 | 32.70 |
| 31.75 | 36.17 | 38.10 | 34.97 | 33.97 |
| 33.02 | 37.44 | 39.37 | 36.24 | 35.24 |
| 34.29 | 38.71 | 40.64 | 37.51 | 36.51 |
| 35.56 | 39.98 | 41.91 | 38.78 | 37.78 |
| 36.83 | 41.25 | 43.18 | 40.05 | 39.05 |
| 38.10 | 42.52 | 44.45 | 41.32 | 40.32 |
| 39.37 | 43.79 | 45.72 | 42.59 | 41.59 |
| 40.64 | 45.06 | 46.99 | 43.86 | 42.86 |
| 41.91 | 46.33 | 48.26 | 45.13 | 44.13 |
| 43.18 | 47.60 | 49.53 | 46.40 | 45.40 |
| 44.45 | 48.87 | 50.80 | 47.67 | 46.67 |
| 45.72 | 50.14 | 52.07 | 48.94 | 47.94 |
| 46.99 | 51.41 | 53.34 | 50.21 | 49.21 |
| 48.26 | 52.68 | 54.61 | 51.48 | 50.48 |
| 49.53 | 53.95 | 55.88 | 52.75 | 51.75 |
| 50.80 | 55.22 | 57.15 | 54.02 | 53.02 |
| 52.07 | 56.49 | 58.42 | 55.29 | 54.29 |
| 53.34 | 57.76 | 59.69 | 56.56 | 55.56 |
| 54.61 | 59.03 | 60.96 | 57.83 | 56.83 |
| 55.88 | 60.30 | 62.23 | 59.10 | 58.10 |
| 57.15 | 61.57 | 63.50 | 60.37 | 59.37 |
| 58.42 | 62.84 | 64.77 | 61.64 | 60.64 |
| 59.69 | 64.11 | 66.04 | 62.91 | 61.91 |
| 60.96 | 65.38 | 67.31 | 64.18 | 63.18 |
| 62.23 | 66.65 | 68.58 | 65.45 | 64.45 |

333 000 for samples
for 560 pieces on reel



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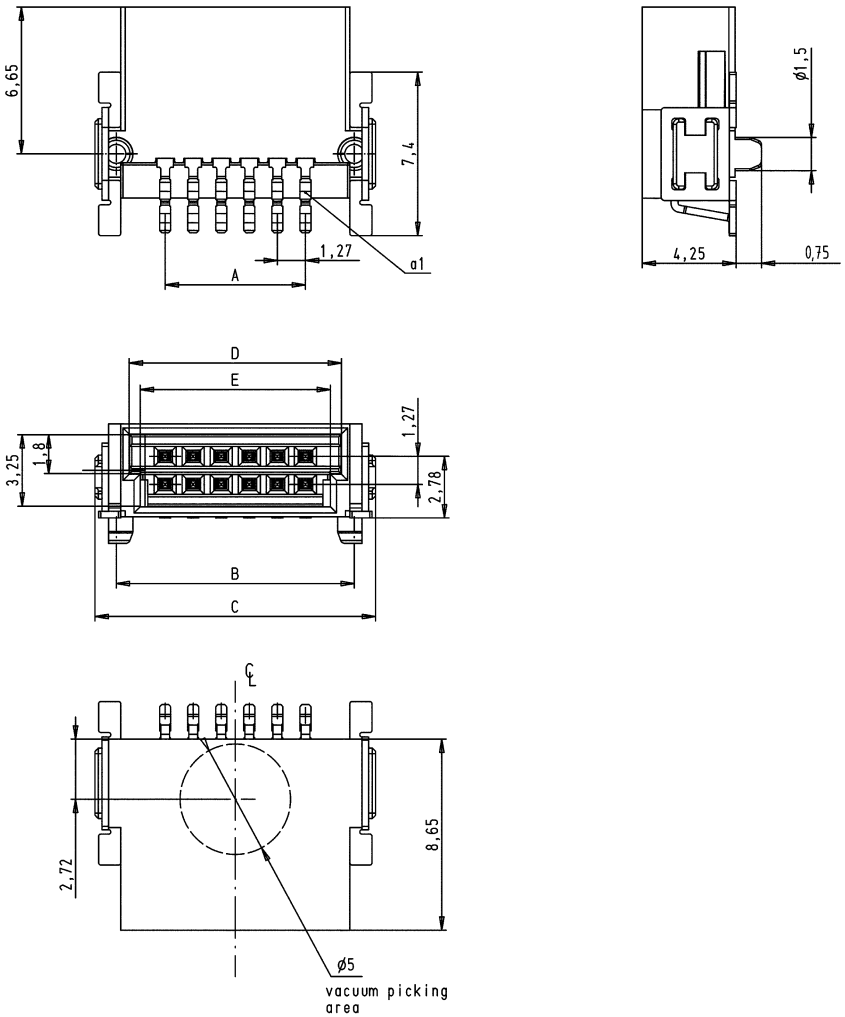
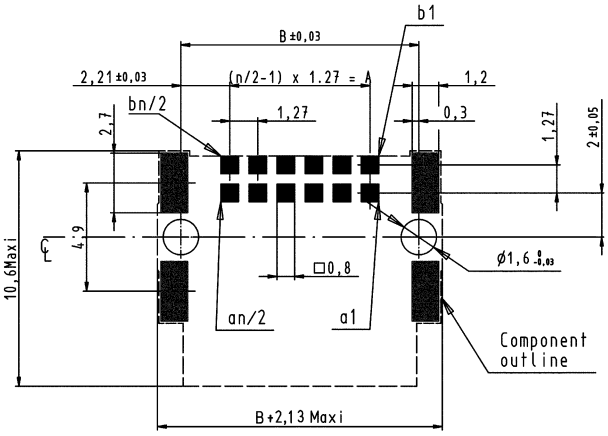
# Male connectors, angled, SMT

| Identification | Drawing | Dimensions in mm |
|---|---|---|
| Dimensions | | |

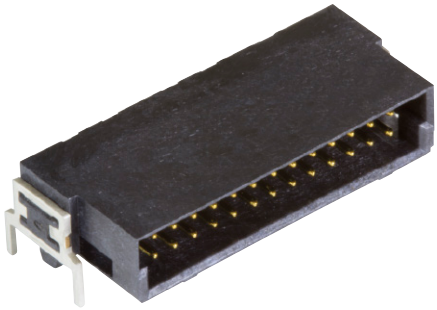



| PCB layout | |
|---|---|






Downloaded from Arrow.com.



## Male connectors, angled, THR

| Identification | No. of contacts | Part number | Dimensions in mm |
|---|---|---|---|

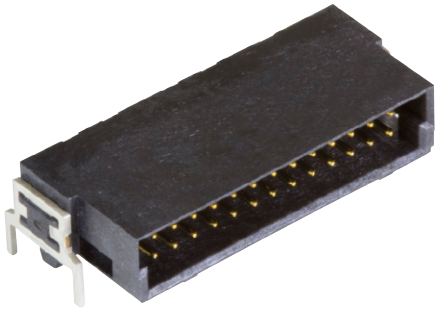
Male connector, angled, THR

| No. of contacts | Part number | A | B | C | D | E |
|---|---|---|---|---|---|---|
| 6 | 15 15 006 2401 . . . | 2.54 | 6.96 | 8.89 | 5.76 | 4.76 |
| 8 | 15 15 008 2401 . . . | 3.81 | 8.23 | 10.16 | 7.03 | 6.03 |
| 10 | 15 15 010 2401 . . . | 5.08 | 9.50 | 11.43 | 8.30 | 7.30 |
| 12 | 15 15 012 2401 . . . | 6.35 | 10.77 | 12.70 | 9.57 | 8.57 |
| 14 | 15 15 014 2401 . . . | 7.62 | 12.04 | 13.97 | 10.84 | 9.84 |
| 16 | 15 15 016 2401 . . . | 8.89 | 13.31 | 15.24 | 12.11 | 11.11 |
| 18 | 15 15 018 2401 . . . | 10.16 | 14.58 | 16.51 | 13.38 | 12.38 |
| 20 | 15 15 020 2401 . . . | 11.43 | 15.85 | 17.78 | 14.65 | 13.65 |
| 22 | 15 15 022 2401 . . . | 12.70 | 17.12 | 19.05 | 15.92 | 14.92 |
| 24 | 15 15 024 2401 . . . | 13.97 | 18.39 | 20.32 | 17.19 | 16.19 |
| 26 | 15 15 026 2401 . . . | 15.24 | 19.66 | 21.59 | 18.46 | 17.46 |
| 28 | 15 15 028 2401 . . . | 16.51 | 20.93 | 22.86 | 19.73 | 18.73 |
| 30 | 15 15 030 2401 . . . | 17.78 | 22.20 | 24.13 | 21.00 | 20.00 |
| 32 | 15 15 032 2401 . . . | 19.05 | 23.47 | 25.40 | 22.27 | 21.27 |
| 34 | 15 15 034 2401 . . . | 20.32 | 24.74 | 26.67 | 23.54 | 22.54 |
| 36 | 15 15 036 2401 . . . | 21.59 | 26.01 | 27.94 | 24.81 | 23.81 |
| 38 | 15 15 038 2401 . . . | 22.86 | 27.28 | 29.21 | 26.08 | 25.08 |
| 40 | 15 15 040 2401 . . . | 24.13 | 28.55 | 30.48 | 27.35 | 26.35 |
| 42 | 15 15 042 2401 . . . | 25.40 | 29.82 | 31.75 | 28.62 | 27.62 |
| 44 | 15 15 044 2401 . . . | 26.67 | 31.09 | 33.02 | 29.89 | 28.89 |
| 46 | 15 15 046 2401 . . . | 27.94 | 32.36 | 34.29 | 31.16 | 30.16 |
| 48 | 15 15 048 2401 . . . | 29.21 | 33.63 | 35.56 | 32.43 | 31.43 |
| 50 | 15 15 050 2401 . . . | 30.48 | 34.90 | 36.83 | 33.70 | 32.70 |
| 52 | 15 15 052 2401 . . . | 31.75 | 36.17 | 38.10 | 34.97 | 33.97 |
| 54 | 15 15 054 2401 . . . | 33.02 | 37.44 | 39.37 | 36.24 | 35.24 |
| 56 | 15 15 056 2401 . . . | 34.29 | 38.71 | 40.64 | 37.51 | 36.51 |
| 58 | 15 15 058 2401 . . . | 35.56 | 39.98 | 41.91 | 38.78 | 37.78 |
| 60 | 15 15 060 2401 . . . | 36.83 | 41.25 | 43.18 | 40.05 | 39.05 |
| 62 | 15 15 062 2401 . . . | 38.10 | 42.52 | 44.45 | 41.32 | 40.32 |
| 64 | 15 15 064 2401 . . . | 39.37 | 43.79 | 45.72 | 42.59 | 41.59 |
| 66 | 15 15 066 2401 . . . | 40.64 | 45.06 | 46.99 | 43.86 | 42.86 |
| 68 | 15 15 068 2401 . . . | 41.91 | 46.33 | 48.26 | 45.13 | 44.13 |
| 70 | 15 15 070 2401 . . . | 43.18 | 47.60 | 49.53 | 46.40 | 45.40 |
| 72 | 15 15 072 2401 . . . | 44.45 | 48.87 | 50.80 | 47.67 | 46.67 |
| 74 | 15 15 074 2401 . . . | 45.72 | 50.14 | 52.07 | 48.94 | 47.94 |
| 76 | 15 15 076 2401 . . . | 46.99 | 51.41 | 53.34 | 50.21 | 49.21 |
| 78 | 15 15 078 2401 . . . | 48.26 | 52.68 | 54.61 | 51.48 | 50.48 |
| 80 | 15 15 080 2401 . . . | 49.53 | 53.95 | 55.88 | 52.75 | 51.75 |
| 82 | 15 15 082 2401 . . . | 50.80 | 55.22 | 57.15 | 54.02 | 53.02 |
| 84 | 15 15 084 2401 . . . | 52.07 | 56.49 | 58.42 | 55.29 | 54.29 |
| 86 | 15 15 086 2401 . . . | 53.34 | 57.76 | 59.69 | 56.56 | 55.56 |
| 88 | 15 15 088 2401 . . . | 54.61 | 59.03 | 60.96 | 57.83 | 56.83 |
| 90 | 15 15 090 2401 . . . | 55.88 | 60.30 | 62.23 | 59.10 | 58.10 |
| 92 | 15 15 092 2401 . . . | 57.15 | 61.57 | 63.50 | 60.37 | 59.37 |
| 94 | 15 15 094 2401 . . . | 58.42 | 62.84 | 64.77 | 61.64 | 60.64 |
| 96 | 15 15 096 2401 . . . | 59.69 | 64.11 | 66.04 | 62.91 | 61.91 |
| 98 | 15 15 098 2401 . . . | 60.96 | 65.38 | 67.31 | 64.18 | 63.18 |
| 100 | 15 15 100 2401 . . . | 62.23 | 66.65 | 68.58 | 65.45 | 64.45 |

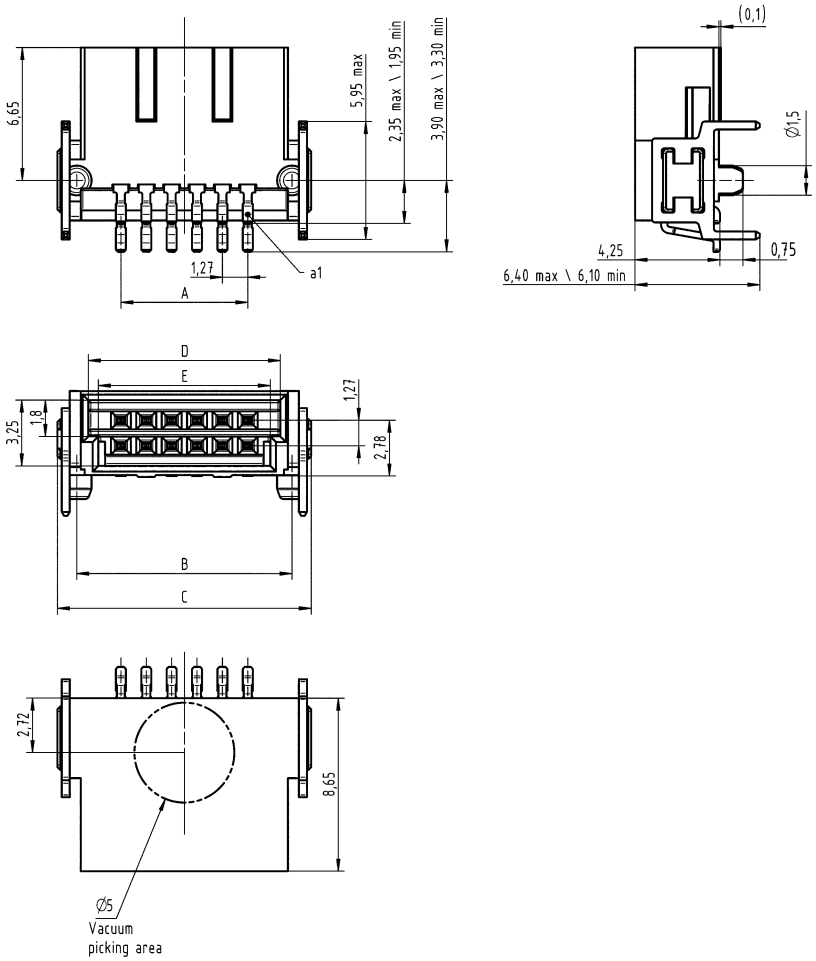
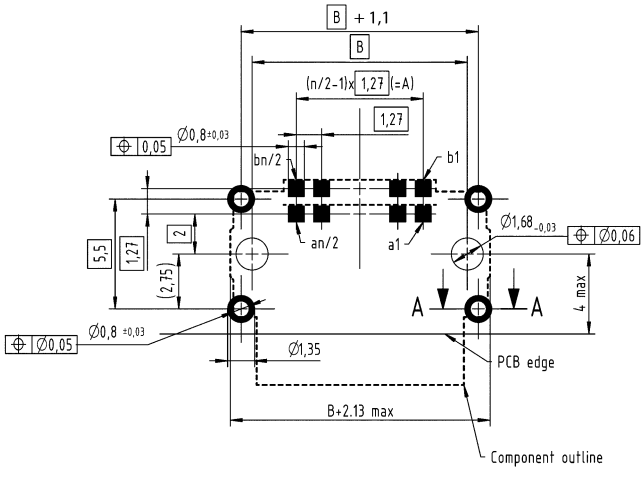
333
000 for samples
for 560 pieces on reel



Downloaded from Arrow.com.



# Male connectors, angled, THR

| Identification | Drawing | Dimensions in mm |
|---|---|---|
| Dimensions |  | |
| PCB layout |  | |







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## Female connectors, angled, SMT

| Identification | No. of contacts | Part number |
|---|---|---|
| Female connector, angled, SMT | 6 | 15 25 006 2601 . . . |
| | 8 | 15 25 008 2601 . . . |
| | 10 | 15 25 010 2601 . . . |
| | 12 | 15 25 012 2601 . . . |
| | 14 | 15 25 014 2601 . . . |
| | 16 | 15 25 016 2601 . . . |
| | 18 | 15 25 018 2601 . . . |
| | 20 | 15 25 020 2601 . . . |
| | 22 | 15 25 022 2601 . . . |
| | 24 | 15 25 024 2601 . . . |
| | 26 | 15 25 026 2601 . . . |
| | 28 | 15 25 028 2601 . . . |
| | 30 | 15 25 030 2601 . . . |
| | 32 | 15 25 032 2601 . . . |
| | 34 | 15 25 034 2601 . . . |
| | 36 | 15 25 036 2601 . . . |
| | 38 | 15 25 038 2601 . . . |
| | 40 | 15 25 040 2601 . . . |
| | 42 | 15 25 042 2601 . . . |
| | 44 | 15 25 044 2601 . . . |
| | 46 | 15 25 046 2601 . . . |
| | 48 | 15 25 048 2601 . . . |
| | 50 | 15 25 050 2601 . . . |
| | 52 | 15 25 052 2601 . . . |
| | 54 | 15 25 054 2601 . . . |
| | 56 | 15 25 056 2601 . . . |
| | 58 | 15 25 058 2601 . . . |
| | 60 | 15 25 060 2601 . . . |
| | 62 | 15 25 062 2601 . . . |
| | 64 | 15 25 064 2601 . . . |
| | 66 | 15 25 066 2601 . . . |
| | 68 | 15 25 068 2601 . . . |
| | 70 | 15 25 070 2601 . . . |
| | 72 | 15 25 072 2601 . . . |
| | 74 | 15 25 074 2601 . . . |
| | 76 | 15 25 076 2601 . . . |
| | 78 | 15 25 078 2601 . . . |
| | 80 | 15 25 080 2601 . . . |
| | 82 | 15 25 082 2601 . . . |
| | 84 | 15 25 084 2601 . . . |
| | 86 | 15 25 086 2601 . . . |
| | 88 | 15 25 088 2601 . . . |
| | 90 | 15 25 090 2601 . . . |
| | 92 | 15 25 092 2601 . . . |
| | 94 | 15 25 094 2601 . . . |
| | 96 | 15 25 096 2601 . . . |
| | 98 | 15 25 098 2601 . . . |
| | 100 | 15 25 100 2601 . . . |

Dimensions in mm

| A | B | C | D | E |
|---|---|---|---|---|
| 2.54 | 6.96 | 8.89 | 5.56 | 4.56 |
| 3.81 | 8.23 | 10.16 | 6.83 | 5.83 |
| 5.08 | 9.50 | 11.43 | 8.10 | 7.10 |
| 6.35 | 10.77 | 12.70 | 9.37 | 8.37 |
| 7.62 | 12.04 | 13.97 | 10.64 | 9.64 |
| 8.89 | 13.31 | 15.24 | 11.91 | 10.91 |
| 10.16 | 14.58 | 16.51 | 13.18 | 12.18 |
| 11.43 | 15.85 | 17.78 | 14.45 | 13.45 |
| 12.70 | 17.12 | 19.05 | 15.72 | 14.72 |
| 13.97 | 18.39 | 20.32 | 16.99 | 15.99 |
| 15.24 | 19.66 | 21.59 | 18.26 | 17.26 |
| 16.51 | 20.93 | 22.86 | 19.53 | 18.53 |
| 17.78 | 22.20 | 24.13 | 20.80 | 19.80 |
| 19.05 | 23.47 | 25.40 | 22.07 | 21.07 |
| 20.32 | 24.74 | 26.67 | 23.34 | 22.34 |
| 21.59 | 26.01 | 27.94 | 24.61 | 23.61 |
| 22.86 | 27.28 | 29.21 | 25.88 | 24.88 |
| 24.13 | 28.55 | 30.48 | 27.15 | 26.15 |
| 25.40 | 29.82 | 31.75 | 28.42 | 27.42 |
| 26.67 | 31.09 | 33.02 | 29.69 | 28.69 |
| 27.94 | 32.36 | 34.29 | 30.96 | 29.96 |
| 29.21 | 33.63 | 35.56 | 32.23 | 31.23 |
| 30.48 | 34.90 | 36.83 | 33.50 | 32.50 |
| 31.75 | 36.17 | 38.10 | 34.77 | 33.77 |
| 33.02 | 37.44 | 39.37 | 36.04 | 35.04 |
| 34.29 | 38.71 | 40.64 | 37.31 | 36.31 |
| 35.56 | 39.98 | 41.91 | 38.58 | 37.58 |
| 36.83 | 41.25 | 43.18 | 39.85 | 38.85 |
| 38.10 | 42.52 | 44.45 | 41.12 | 40.12 |
| 39.37 | 43.79 | 45.72 | 42.39 | 41.39 |
| 40.64 | 45.06 | 46.99 | 43.66 | 42.66 |
| 41.91 | 46.33 | 48.26 | 44.93 | 43.93 |
| 43.18 | 47.60 | 49.53 | 46.20 | 45.20 |
| 44.45 | 48.87 | 50.80 | 47.47 | 46.47 |
| 45.72 | 50.14 | 52.07 | 48.74 | 47.74 |
| 46.99 | 51.41 | 53.34 | 50.01 | 49.01 |
| 48.26 | 52.68 | 54.61 | 51.28 | 50.28 |
| 49.53 | 53.95 | 55.88 | 52.55 | 51.55 |
| 50.80 | 55.22 | 57.15 | 53.82 | 52.82 |
| 52.07 | 56.49 | 58.42 | 55.09 | 54.09 |
| 53.34 | 57.76 | 59.69 | 56.36 | 55.36 |
| 54.61 | 59.03 | 60.96 | 57.63 | 56.63 |
| 55.88 | 60.30 | 62.23 | 58.90 | 57.90 |
| 57.15 | 61.57 | 63.50 | 60.17 | 59.17 |
| 58.42 | 62.84 | 64.77 | 61.44 | 60.44 |
| 59.69 | 64.11 | 66.04 | 62.71 | 61.71 |
| 60.96 | 65.38 | 67.31 | 63.98 | 62.98 |
| 62.23 | 66.65 | 68.58 | 65.25 | 64.25 |

333
000
for samples
for 560 pieces on reel



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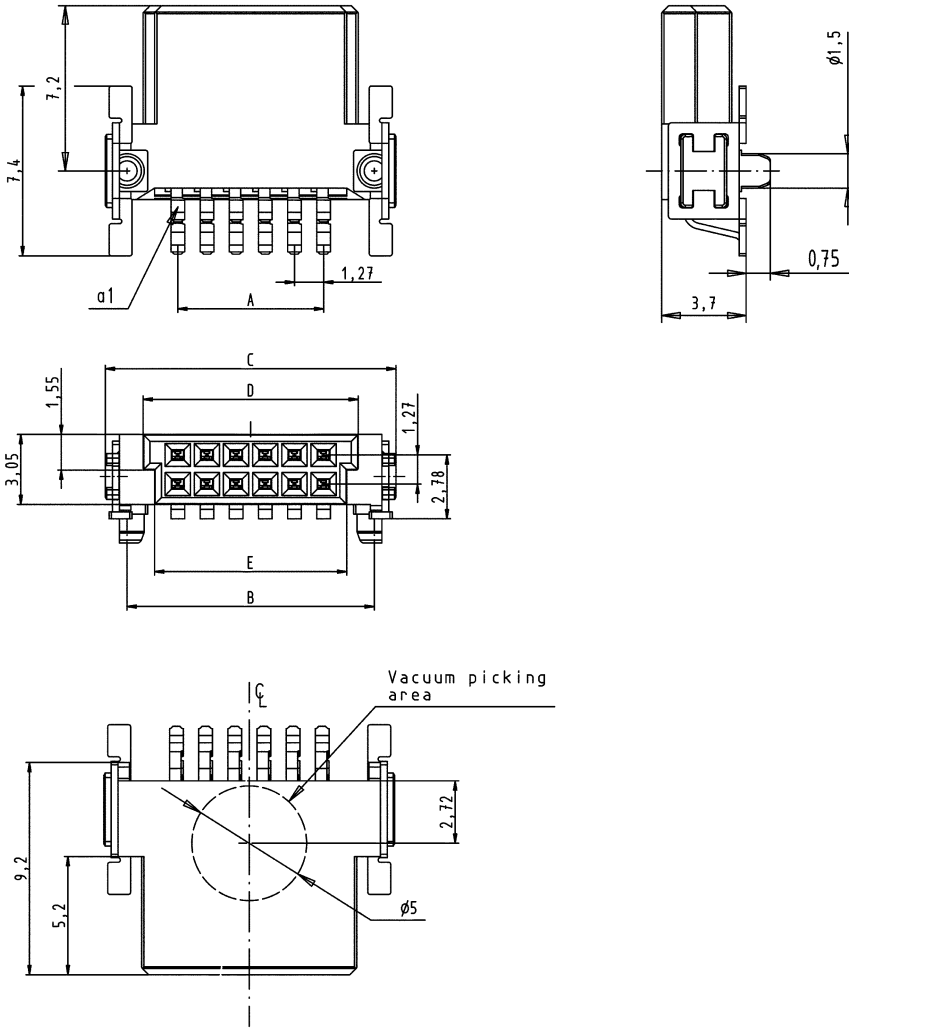
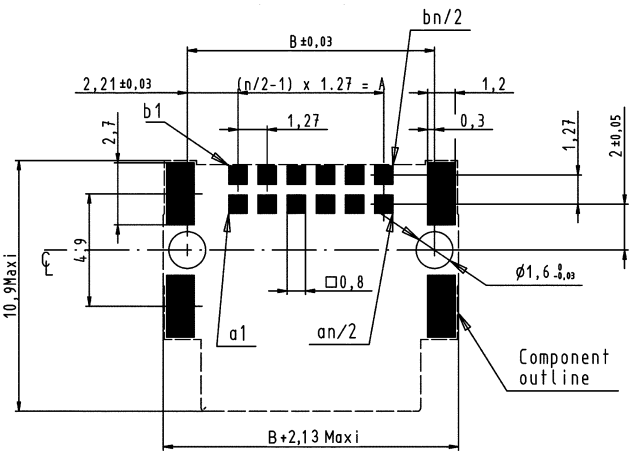
# Female connectors, angled, SMT

| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Dimensions




## PCB layout



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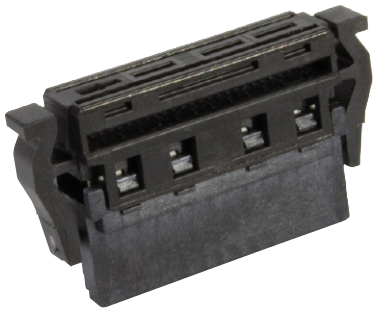

## Female connectors, IDC

| Identification | Number of contacts | Part No. | Dimensions in mm | | | | |
|---|---|---|---|---|---|---|---|
| | | | A | B | C | D | E |
| Female connector, IDC in a tray packaging | 6 | 15 29 006 250 . 000 | 2.54 | 11.59 | 5.56 | 4.56 | 15.00 |
| | 8 | 15 29 008 250 . 000 | 3.81 | 12.86 | 6.83 | 5.83 | 15.00 |
| | 10 | 15 29 010 250 . 000 | 5.08 | 14.13 | 8.10 | 7.10 | 15.00 |
| | 12 | 15 29 012 250 . 000 | 6.35 | 15.40 | 9.37 | 8.37 | 15.00 |
| | 14 | 15 29 014 250 . 000 | 7.62 | 16.67 | 10.64 | 9.64 | 15.00 |
| | 16 | 15 29 016 250 . 000 | 8.89 | 17.94 | 11.91 | 10.91 | 15.00 |
| | 18 | 15 29 018 250 . 000 | 10.16 | 19.21 | 13.18 | 12.18 | 15.00 |
| | 20 | 15 29 020 250 . 000 | 11.43 | 20.48 | 14.45 | 13.45 | 15.00 |
| | 22 | 15 29 022 250 . 000 | 12.70 | 21.75 | 15.72 | 14.72 | 15.00 |
| | 24 | 15 29 024 250 . 000 | 13.97 | 23.02 | 16.99 | 15.99 | 15.00 |
| | 26 | 15 29 026 250 . 000 | 15.24 | 24.29 | 18.26 | 17.26 | 15.00 |
| | 28 | 15 29 028 250 . 000 | 16.51 | 25.56 | 19.53 | 18.53 | 15.00 |
| | 30 | 15 29 030 250 . 000 | 17.78 | 26.83 | 20.80 | 19.80 | 15.00 |
| | 32 | 15 29 032 250 . 000 | 19.05 | 28.10 | 22.07 | 21.07 | 15.00 |
| | 34 | 15 29 034 250 . 000 | 20.32 | 29.37 | 23.34 | 22.34 | 15.00 |
| | 36 | 15 29 036 250 . 000 | 21.59 | 30.64 | 24.61 | 23.61 | 15.00 |
| | 38 | 15 29 038 250 . 000 | 22.86 | 31.91 | 25.88 | 24.88 | 15.00 |
| | 40 | 15 29 040 250 . 000 | 24.13 | 33.18 | 27.15 | 26.15 | 15.00 |
| | 42 | 15 29 042 250 . 000 | 25.40 | 34.45 | 28.42 | 27.42 | 15.00 |
| | 44 | 15 29 044 250 . 000 | 26.67 | 35.72 | 29.69 | 28.69 | 15.00 |
| | 46 | 15 29 046 250 . 000 | 27.94 | 36.99 | 30.96 | 29.96 | 15.00 |
| | 48 | 15 29 048 250 . 000 | 29.21 | 38.26 | 32.23 | 31.23 | 15.00 |
| | 50 | 15 29 050 250 . 000 | 30.48 | 39.53 | 33.50 | 32.50 | 15.00 |
| | 52 | 15 29 052 250 . 000 | 31.75 | 40.80 | 34.77 | 33.77 | 15.00 |
| | 54 | 15 29 054 250 . 000 | 33.02 | 42.07 | 36.04 | 35.04 | 15.00 |
| | 56 | 15 29 056 250 . 000 | 34.29 | 43.34 | 37.31 | 36.31 | 15.00 |
| | 58 | 15 29 058 250 . 000 | 35.56 | 44.61 | 38.58 | 37.58 | 15.00 |
| | 60 | 15 29 060 250 . 000 | 36.83 | 45.88 | 39.85 | 38.85 | 16.20 |
| | 62 | 15 29 062 250 . 000 | 38.10 | 47.15 | 41.12 | 40.12 | 16.20 |
| | 64 | 15 29 064 250 . 000 | 39.37 | 48.42 | 42.39 | 41.39 | 16.20 |
| | 66 | 15 29 066 250 . 000 | 40.64 | 49.69 | 43.66 | 42.66 | 16.20 |
| | 68 | 15 29 068 250 . 000 | 41.91 | 50.96 | 44.93 | 43.93 | 16.20 |
| | 70 | 15 29 070 250 . 000 | 43.18 | 52.23 | 46.20 | 45.20 | 16.20 |
| | 72 | 15 29 072 250 . 000 | 44.45 | 53.50 | 47.47 | 46.47 | 16.20 |
| | 74 | 15 29 074 250 . 000 | 45.72 | 54.77 | 48.74 | 47.74 | 16.20 |
| | 76 | 15 29 076 250 . 000 | 46.99 | 56.04 | 50.01 | 49.01 | 16.20 |
| | 78 | 15 29 078 250 . 000 | 48.26 | 57.31 | 51.28 | 50.28 | 16.20 |
| | 80 | 15 29 080 250 . 000 | 49.53 | 58.58 | 52.55 | 51.55 | 16.20 |
| | 82 | 15 29 082 250 . 000 | 50.80 | 59.85 | 53.82 | 52.82 | 16.20 |
| | 84 | 15 29 084 250 . 000 | 52.07 | 61.12 | 55.09 | 54.09 | 16.20 |
| | 86 | 15 29 086 250 . 000 | 53.34 | 62.39 | 56.36 | 55.36 | 16.20 |
| | 88 | 15 29 088 250 . 000 | 54.61 | 63.66 | 57.63 | 56.63 | 16.20 |
| | 90 | 15 29 090 250 . 000 | 55.88 | 64.93 | 58.90 | 57.90 | 16.20 |
| | 92 | 15 29 092 250 . 000 | 57.15 | 66.20 | 60.17 | 59.17 | 16.20 |
| | 94 | 15 29 094 250 . 000 | 58.42 | 67.47 | 61.44 | 60.44 | 16.20 |
| | 96 | 15 29 096 250 . 000 | 59.69 | 68.74 | 62.71 | 61.71 | 16.20 |
| | 98 | 15 29 098 250 . 000 | 60.96 | 70.01 | 63.98 | 62.98 | 16.20 |
| | 100 | 15 29 100 250 . 000 | 62.23 | 71.28 | 65.25 | 64.25 | 16.20 |

without strain relief 1
with strain relief 2



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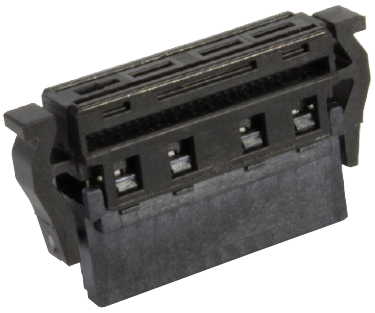
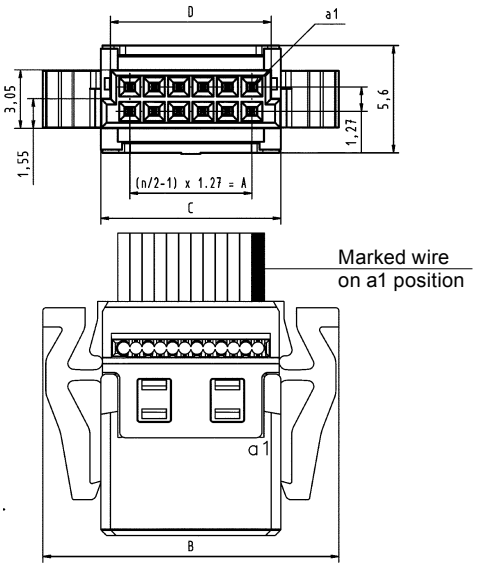
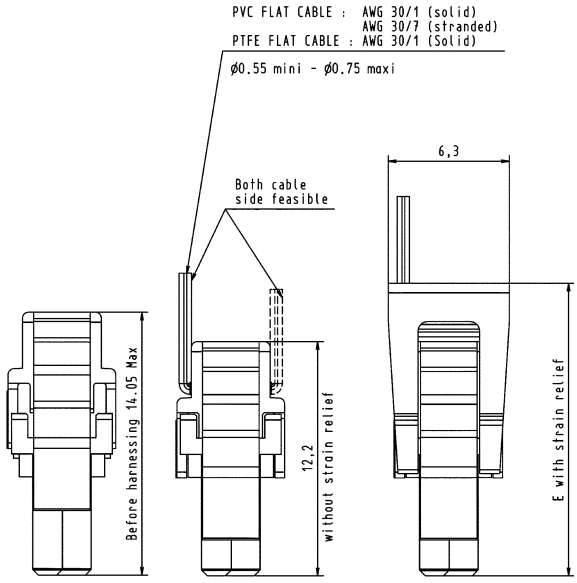


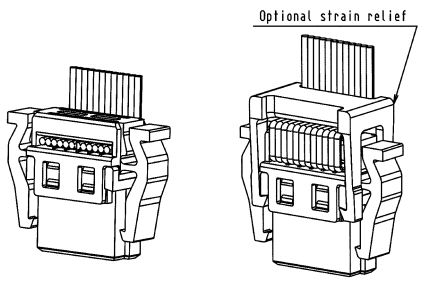
# Female connectors, IDC

| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Dimensions



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# Strain reliefs for female connectors, IDC

| Identification | Number of contacts | Part No. | Dimensions in mm |
|---|---|---|---|
| | | | A |
| Strain reliefs for female connectors, IDC | 6 | 15 29 006 0503 000 | 7.31 |
| | 8 | 15 29 008 0503 000 | 8.58 |
| | 10 | 15 29 010 0503 000 | 9.85 |
| | 12 | 15 29 012 0503 000 | 11.12 |
| | 14 | 15 29 014 0503 000 | 12.39 |
| | 16 | 15 29 016 0503 000 | 13.66 |
| | 18 | 15 29 018 0503 000 | 14.93 |
| | 20 | 15 29 020 0503 000 | 16.20 |
| | 22 | 15 29 022 0503 000 | 17.47 |
| | 24 | 15 29 024 0503 000 | 18.74 |
| | 26 | 15 29 026 0503 000 | 20.01 |
| | 28 | 15 29 028 0503 000 | 21.28 |
| | 30 | 15 29 030 0503 000 | 22.55 |
| | 32 | 15 29 032 0503 000 | 23.82 |
| | 34 | 15 29 034 0503 000 | 25.09 |
| | 36 | 15 29 036 0503 000 | 26.36 |
| | 38 | 15 29 038 0503 000 | 27.63 |
| | 40 | 15 29 040 0503 000 | 28.90 |
| | 42 | 15 29 042 0503 000 | 30.17 |
| | 44 | 15 29 044 0503 000 | 31.44 |
| | 46 | 15 29 046 0503 000 | 32.71 |
| | 48 | 15 29 048 0503 000 | 33.98 |
| | 50 | 15 29 050 0503 000 | 35.25 |
| | 52 | 15 29 052 0503 000 | 36.52 |
| | 54 | 15 29 054 0503 000 | 37.79 |
| | 56 | 15 29 056 0503 000 | 39.06 |
| | 58 | 15 29 058 0503 000 | 40.33 |
| | 60 | 15 29 060 0503 000 | 41.60 |
| | 62 | 15 29 062 0503 000 | 42.87 |
| | 64 | 15 29 064 0503 000 | 44.14 |
| | 66 | 15 29 066 0503 000 | 45.41 |
| | 68 | 15 29 068 0503 000 | 46.68 |
| | 70 | 15 29 070 0503 000 | 47.95 |
| | 72 | 15 29 072 0503 000 | 49.22 |
| | 74 | 15 29 074 0503 000 | 50.49 |
| | 76 | 15 29 076 0503 000 | 51.76 |
| | 78 | 15 29 078 0503 000 | 53.03 |
| | 80 | 15 29 080 0503 000 | 54.30 |
| | 82 | 15 29 082 0503 000 | 55.57 |
| | 84 | 15 29 084 0503 000 | 56.84 |
| | 86 | 15 29 086 0503 000 | 58.11 |
| | 88 | 15 29 088 0503 000 | 59.38 |
| | 90 | 15 29 090 0503 000 | 60.65 |
| | 92 | 15 29 092 0503 000 | 61.92 |
| | 94 | 15 29 094 0503 000 | 63.19 |
| | 96 | 15 29 096 0503 000 | 64.46 |
| | 98 | 15 29 098 0503 000 | 65.73 |
| | 100 | 15 29 100 0503 000 | 67.00 |



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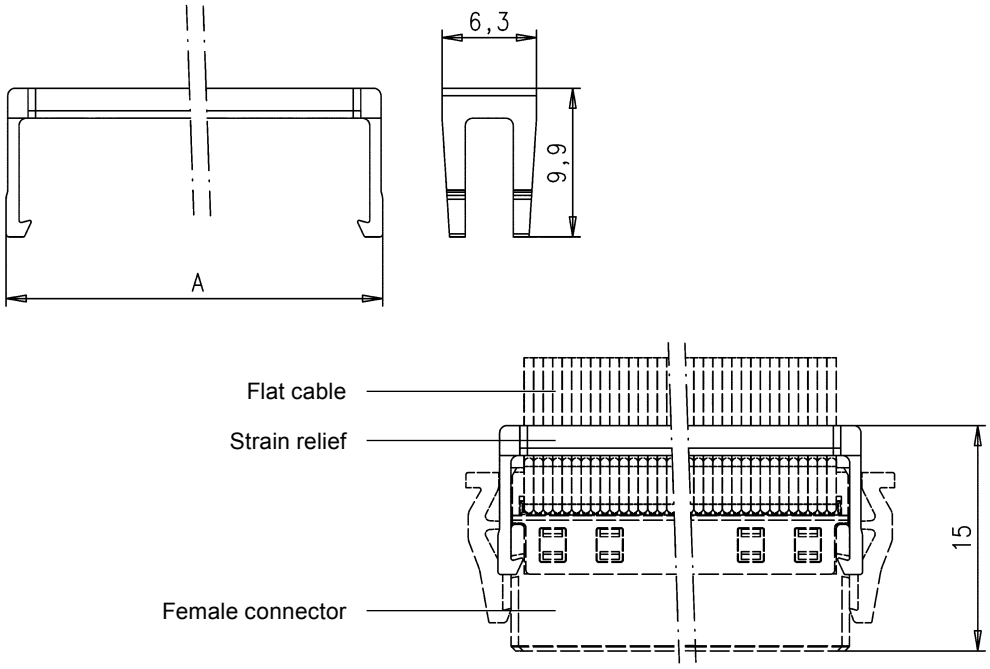
# Strain reliefs for female connectors, IDC

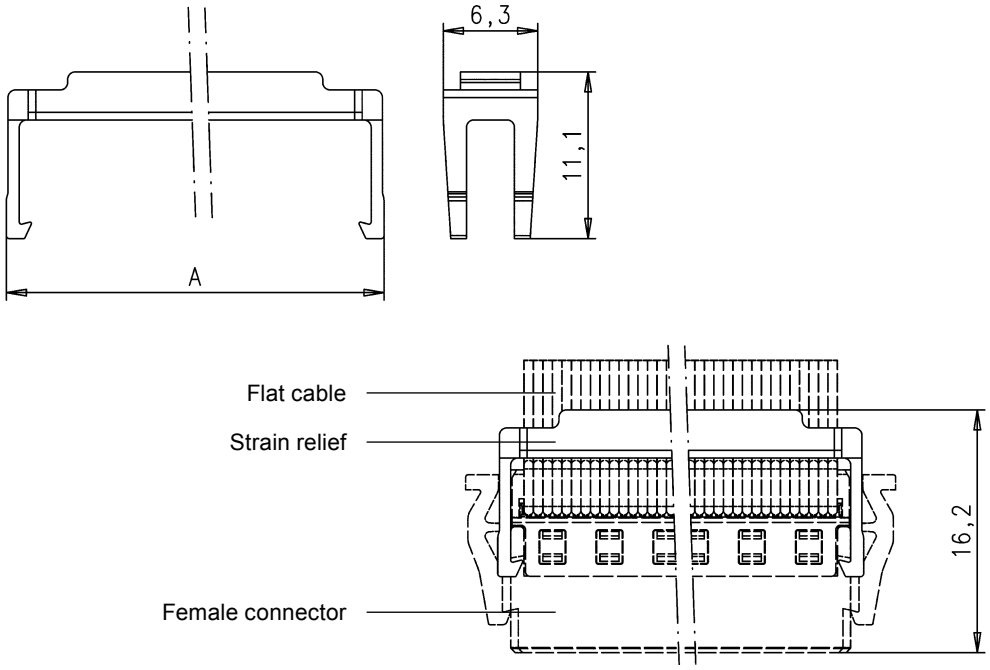
| Identification | Drawing | Dimensions in mm |
|---|---|---|

## Dimensions

6 – 58 contacts




60 – 100 contacts





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| | |
|---|---|
| Number of contacts | 6, 8, 10 … 96, 98, 100 |
| Rated voltage | 150 V |
| Core structure | AWG 30/7 |
| Strain relief | with / without |
| Connector direction | same / different |
| Wiring | 1 : 1 / crossed |

Cable types

**PVC**

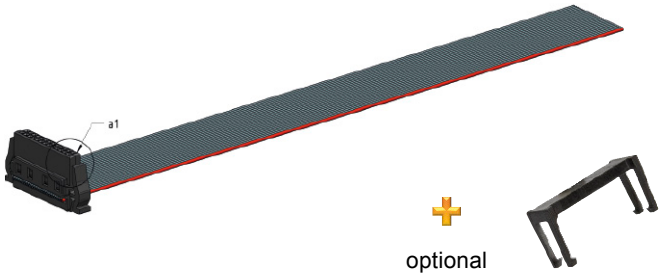
| | |
|---|---|
| Operating temperatures | -20 °C … +105 °C |

**Halogen free**

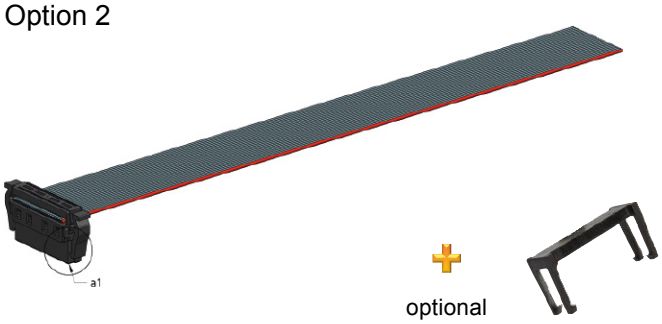
| | |
|---|---|
| Operating temperatures | -40 °C … +125 °C |

Options

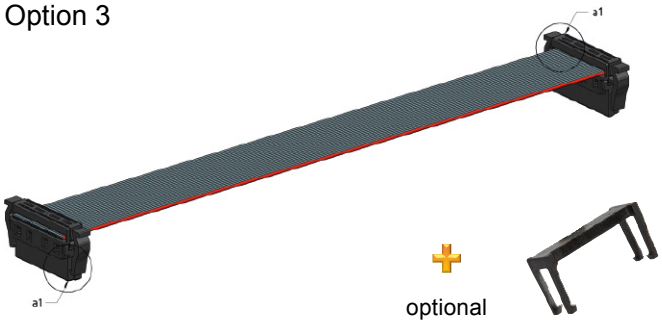
Option 1




Option 2




Option 3



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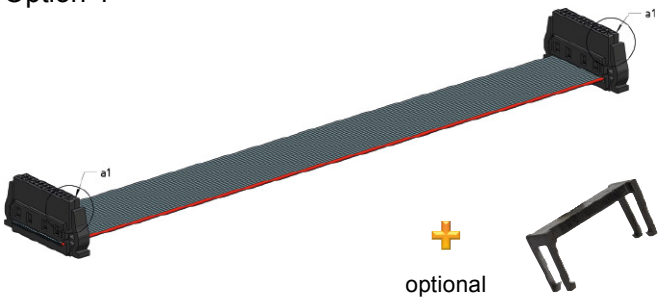
## Options

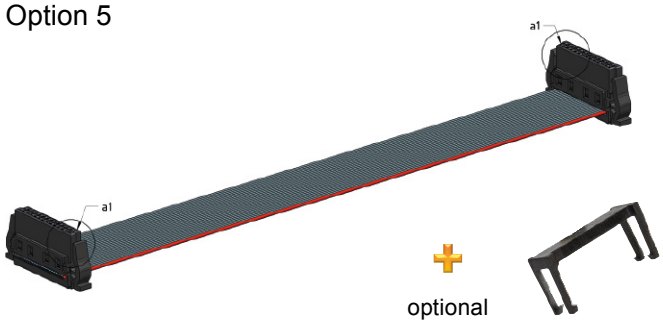
### Option 4




optional



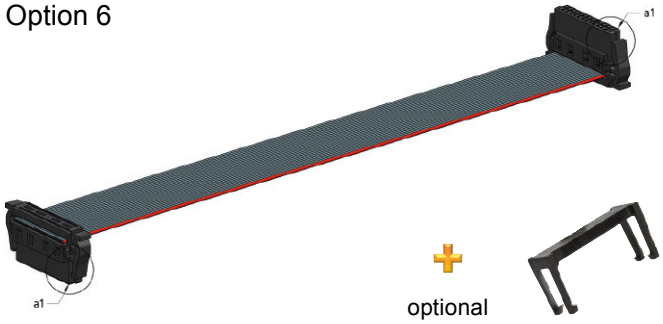
### Option 5




optional



### Option 6

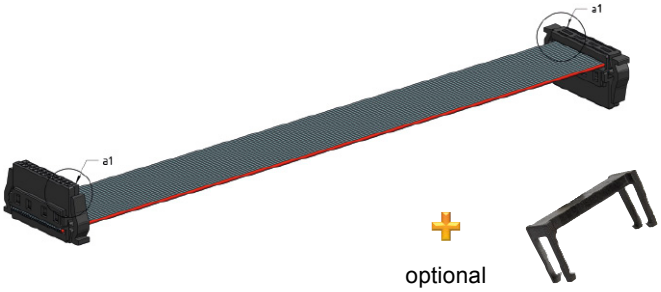



optional



## Options

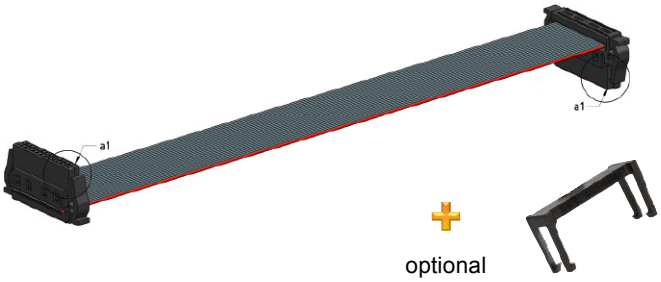
### Option 7




optional



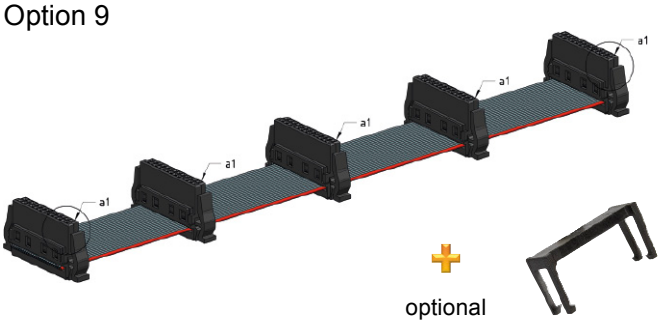
### Option 8




optional



### Option 9




optional







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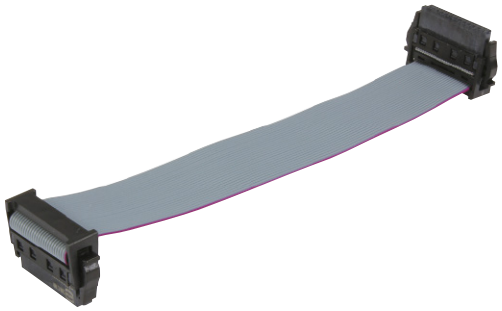
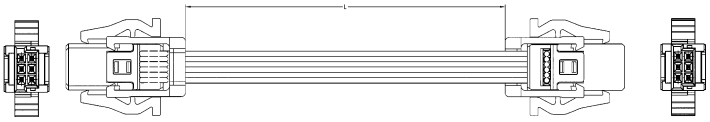
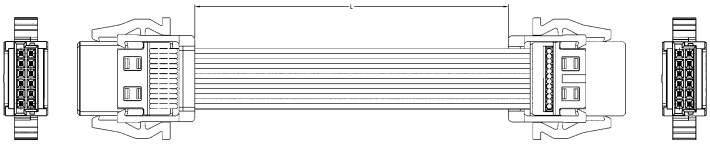


# Cable assemblies

| Identification | | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| **Cable assembly *har*-flex® and different connector direction**<br>Cable: Flat cable PVC, AWG 30/7, 0.635 mm pitch<br>Wiring: 1:1 | | | | |
| Connectors with strain relief | | | | |
| **6 poles** | Length: L = 0.1 m | 33 15 243 0100 001 |  | |
| | L = 0.2 m | 33 15 243 0200 002 | | |
| | L = 0.5 m | 33 15 243 0500 003 | | |
| Connectors without strain relief | | | | |
| **6 poles** | Length: L = 0.1 m | 33 15 243 0100 373 | | |
| | L = 0.2 m | 33 15 243 0200 373 | | |
| | L = 0.5 m | 33 15 243 0500 373 | | |
| Connectors with strain relief | | | | |
| **12 poles** | Length: L = 0.1 m | 33 15 243 0100 004 |  | |
| | L = 0.2 m | 33 15 243 0200 005 | | |
| | L = 0.5 m | 33 15 243 0500 006 | | |
| Connectors without strain relief | | | | |
| **12 poles** | Length: L = 0.1 m | 33 15 243 0100 374 | | |
| | L = 0.2 m | 33 15 243 0200 374 | | |
| | L = 0.5 m | 33 15 243 0500 374 | | |

Further pin counts on request



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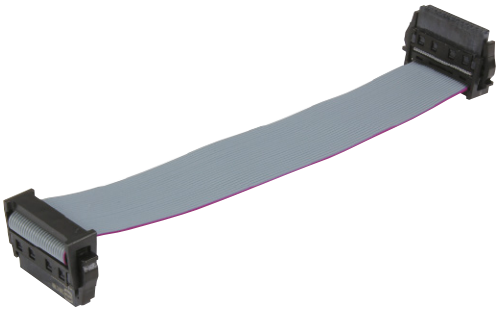
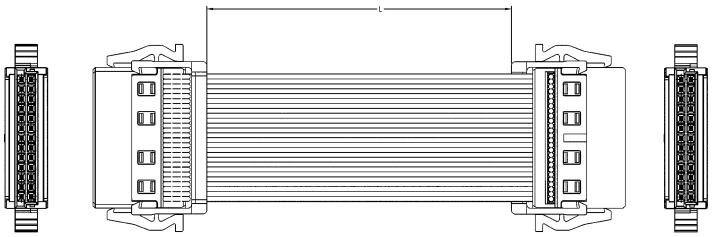
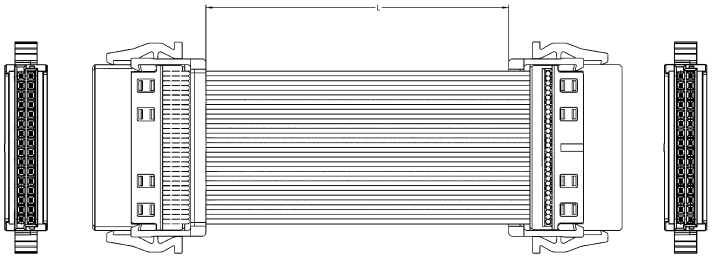


# Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly *har*-flex® and different connector direction**<br>Cable: Flat cable PVC, AWG 30/7, 0.635 mm pitch<br>Wiring: 1:1 | | | |
| Connectors with strain relief | | | |
| **26 poles** Length: L = 0.1 m | 33 15 243 0100 007 | | |
| L = 0.2 m | 33 15 243 0200 008 | | |
| L = 0.5 m | 33 15 243 0500 009 | | |
| Connectors without strain relief | | | |
| **26 poles** Length: L = 0.1 m | 33 15 243 0100 375 | | |
| L = 0.2 m | 33 15 243 0200 375 | | |
| L = 0.5 m | 33 15 243 0500 375 | | |
| Connectors with strain relief | | | |
| **32 poles** Length: L = 0.1 m | 33 15 243 0100 010 | | |
| L = 0.2 m | 33 15 243 0200 011 | | |
| L = 0.5 m | 33 15 243 0500 012 | | |
| Connectors without strain relief | | | |
| **32 poles** Length: L = 0.1 m | 33 15 243 0100 376 | | |
| L = 0.2 m | 33 15 243 0200 376 | | |
| L = 0.5 m | 33 15 243 0500 376 | | |





Further pin counts on request



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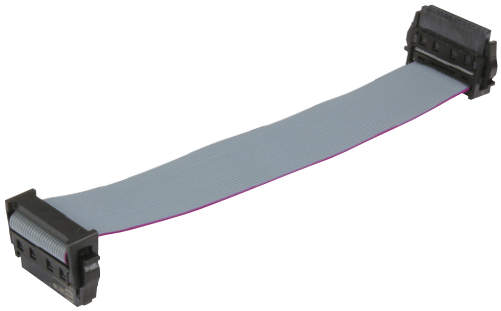
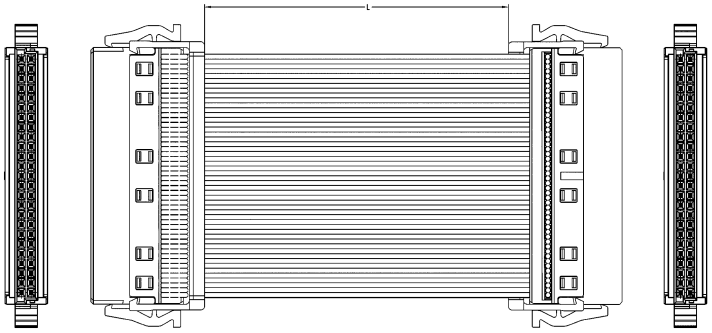
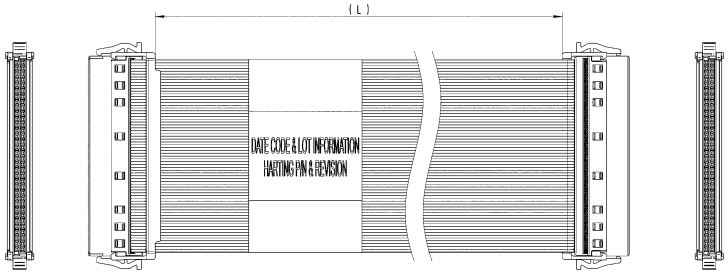


# Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly *har*-flex® and different connector direction**<br>Cable: Flat cable PVC, AWG 30/7, 0.635 mm pitch<br>Wiring: 1:1 | | | |
| Connectors with strain relief | | | |
| **50 poles** Length: L = 0.1 m | 33 15 243 0100 013 | | |
| L = 0.2 m | 33 15 243 0200 014 | | |
| L = 0.5 m | 33 15 243 0500 015 | | |
| Connectors without strain relief | | | |
| **50 poles** Length: L = 0.1 m | 33 15 243 0100 377 | | |
| L = 0.2 m | 33 15 243 0200 377 | | |
| L = 0.5 m | 33 15 243 0500 377 | | |
| Connectors with strain relief | | | |
| **68 poles** Length: L = 0.1 m | 33 15 243 0100 122 | | |
| L = 0.2 m | 33 15 243 0200 122 | | |
| L = 0.5 m | 33 15 243 0500 122 | | |
| Connectors without strain relief | | | |
| **68 poles** Length: L = 0.1 m | 33 15 243 0100 378 | | |
| L = 0.2 m | 33 15 243 0200 378 | | |
| L = 0.5 m | 33 15 243 0500 378 | | |






Further pin counts on request



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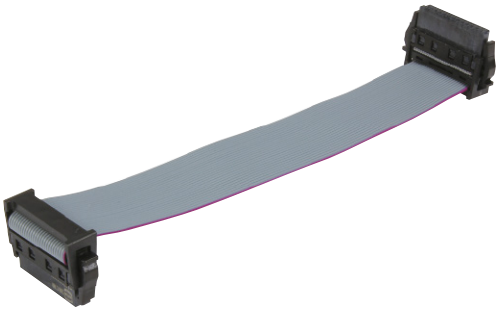
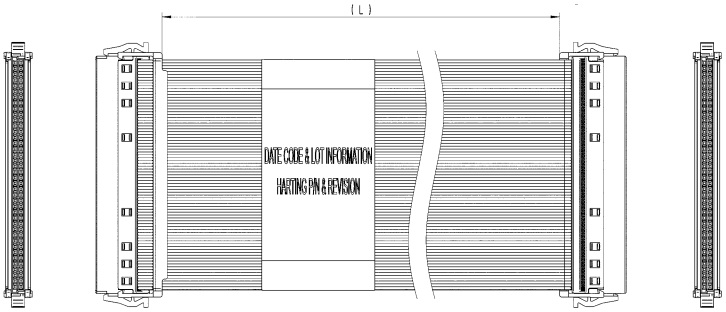


## Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly *har*-flex® and different connector direction**<br>Cable: Flat cable PVC, AWG 30/7, 0.635 mm pitch<br>Wiring: 1:1 | | | |
| Connectors with strain relief | | | |
| **80 poles** Length: L = 0.1 m | 33 15 243 0100 123 | | |
| L = 0.2 m | 33 15 243 0200 123 | | |
| L = 0.5 m | 33 15 243 0500 123 | | |
| Connectors without strain relief | | | |
| **80 poles** Length: L = 0.1 m | 33 15 243 0100 379 | | |
| L = 0.2 m | 33 15 243 0200 379 | | |
| L = 0.5 m | 33 15 243 0500 379 | | |




Further pin counts on request



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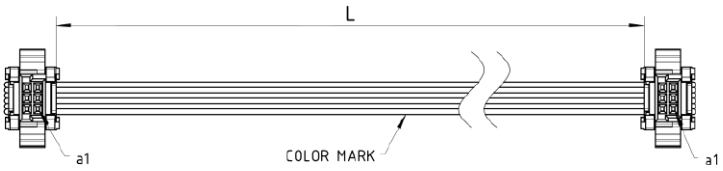
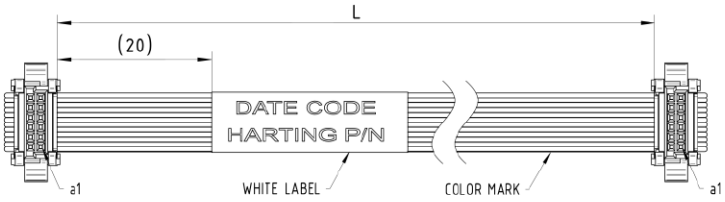
# Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly *har*-flex® and similar connector direction**<br>Cable: Flat cable PVC, AWG 30/7, 0.635 mm pitch<br>Wiring: 1:1 | | | |
| Connectors with strain relief | | | |
| **6 poles** Length: L = 0.1 m | 33 15 243 0100 382 |  | |
| L = 0.2 m | 33 15 243 0200 382 | | |
| L = 0.5 m | 33 15 243 0500 382 | | |
| Connectors without strain relief | | | |
| **6 poles** Length: L = 0.1 m | 33 15 243 0100 380 | | |
| L = 0.2 m | 33 15 243 0200 380 | | |
| L = 0.5 m | 33 15 243 0500 380 | | |
| Connectors with strain relief | | | |
| **12 poles** Length: L = 0.1 m | 33 15 243 0100 102 |  | |
| L = 0.2 m | 33 15 243 0200 102 | | |
| L = 0.5 m | 33 15 243 0500 102 | | |
| Connectors without strain relief | | | |
| **12 poles** Length: L = 0.1 m | 33 15 243 0100 145 | | |
| L = 0.2 m | 33 15 243 0200 145 | | |
| L = 0.5 m | 33 15 243 0500 145 | | |

Further pin counts on request



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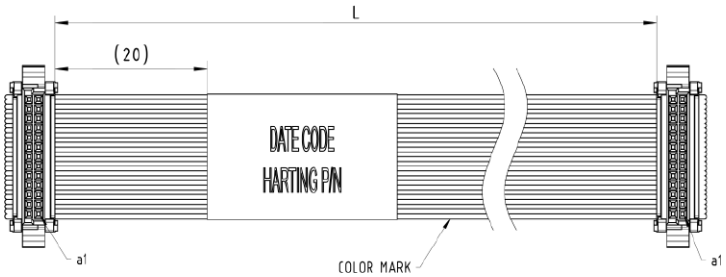
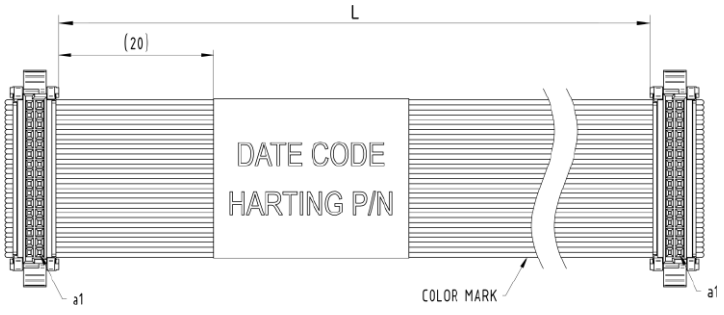
## Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly *har*-flex® and similar connector direction**<br>Cable: Flat cable PVC, AWG 30/7, 0.635 mm pitch<br>Wiring: 1:1 | | | |
| Connectors with strain relief | | | |
| **26 poles** Length: L = 0.1 m | 33 15 243 0100 065 | | |
| L = 0.2 m | 33 15 243 0200 065 | | |
| L = 0.5 m | 33 15 243 0500 065 | | |
| Connectors without strain relief | | | |
| **26 poles** Length: L = 0.1 m | 33 15 243 0100 125 | | |
| L = 0.2 m | 33 15 243 0200 125 | | |
| L = 0.5 m | 33 15 243 0500 125 | | |
| Connectors with strain relief | | | |
| **32 poles** Length: L = 0.1 m | 33 15 243 0100 383 | | |
| L = 0.2 m | 33 15 243 0200 383 | | |
| L = 0.5 m | 33 15 243 0500 383 | | |
| Connectors without strain relief | | | |
| **32 poles** Length: L = 0.1 m | 33 15 243 0100 381 | | |
| L = 0.2 m | 33 15 243 0200 381 | | |
| L = 0.5 m | 33 15 243 0500 381 | | |




Further pin counts on request



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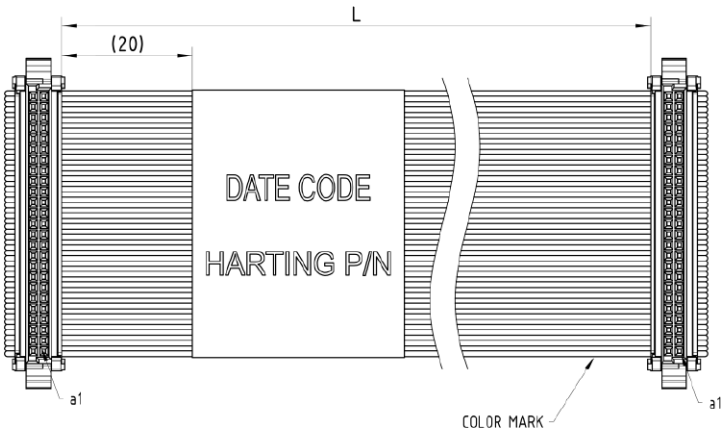
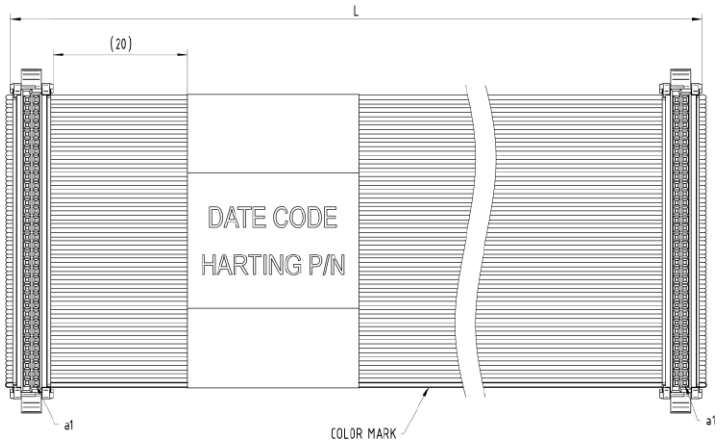
# Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly *har*-flex® and similar connector direction**<br>Cable: Flat cable PVC, AWG 30/7, 0.635 mm pitch<br>Wiring: 1:1 | | | |
| Connectors with strain relief | | | |
| **50 poles** Length: L = 0.1 m | 33 15 243 0100 384 | | |
| L = 0.2 m | 33 15 243 0200 384 | | |
| L = 0.5 m | 33 15 243 0500 384 | | |
| Connectors without strain relief | | | |
| **50 poles** Length: L = 0.1 m | 33 15 243 0100 147 | | |
| L = 0.2 m | 33 15 243 0200 147 | | |
| L = 0.5 m | 33 15 243 0500 147 | | |
| Connectors with strain relief | | | |
| **68 poles** Length: L = 0.1 m | 33 15 243 0100 385 | | |
| L = 0.2 m | 33 15 243 0200 385 | | |
| L = 0.5 m | 33 15 243 0500 385 | | |
| Connectors without strain relief | | | |
| **68 poles** Length: L = 0.1 m | 33 15 243 0100 148 | | |
| L = 0.2 m | 33 15 243 0200 148 | | |
| L = 0.5 m | 33 15 243 0500 148 | | |




Further pin counts on request



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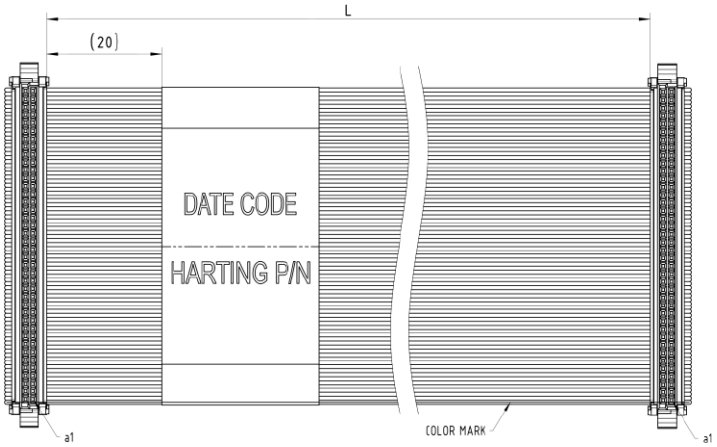
# Cable assemblies

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Cable assembly *har*-flex® and similar connector direction**<br>Cable: Flat cable PVC, AWG 30/7, 0.635 mm pitch<br>Wiring: 1:1 | | | |
| Connectors with strain relief | | | |
| **80 poles** Length: L = 0.1 m | 33 15 243 0100 386 | | |
| L = 0.2 m | 33 15 243 0200 386 | | |
| L = 0.5 m | 33 15 243 0500 386 | | |
| Connectors without strain relief | | | |
| **80 poles** Length: L = 0.1 m | 33 15 243 0100 149 | | |
| L = 0.2 m | 33 15 243 0200 149 | | |
| L = 0.5 m | 33 15 243 0500 149 | | |




Further pin counts on request



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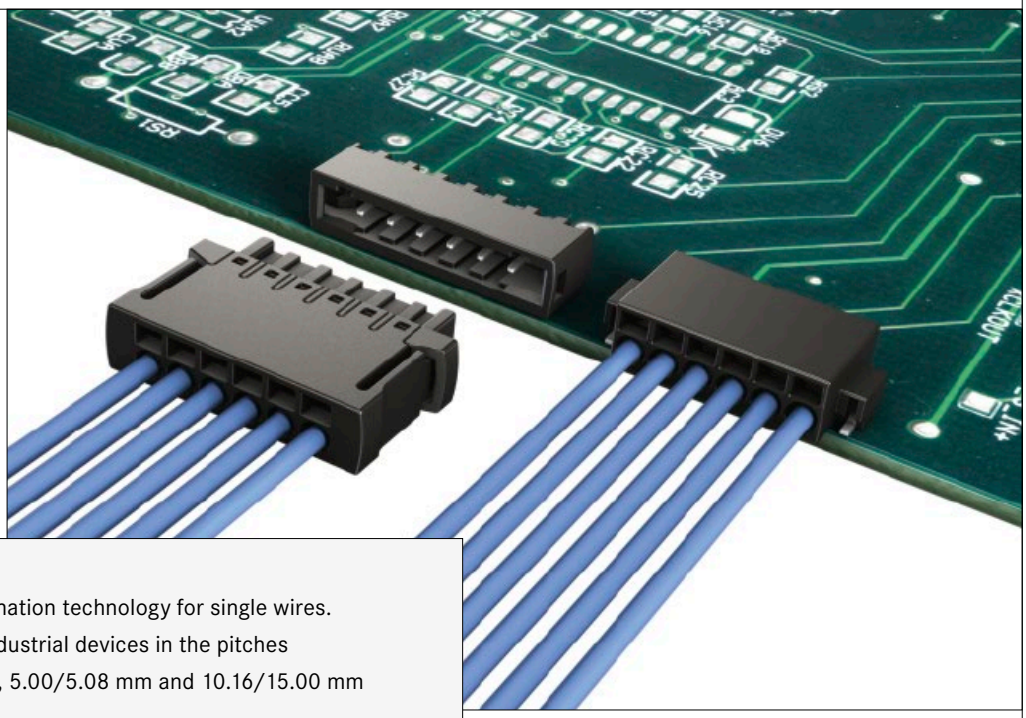
# 15. *har*-flexicon® Connectors



*har*-flexicon® is the robust PCB termination technology for single wires. Components for the termination of industrial devices in the pitches of 1.27 mm, 2.54 mm, 3.50/3.81 mm, 5.00/5.08 mm and 10.16/15.00 mm are available.
All components are particularly suited for reflow- and wave-soldering on the PCB and offer field assembly with PushIn, insulation displacement and screw termination for single wires.

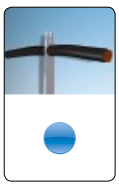
*Application profile:*

| CONNECTION TYPE | | ENVIRONMENT | | APPLICATION | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Board to Board | Cable/ Wire to Board | IP20 | IP65 / IP67 | Data | Signal | Power | high performance | | | |
| | | | | | | | Data transfer rate | Shielding | Number of contacts, contact density | Voltage, working current |
| | ● | ● | | ● | ● | ● | ● | | ● | ● |

**Cable termination**

*Han-Quick Lock®*

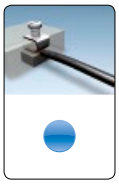
*IDC*



●

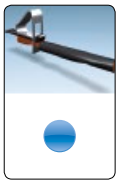
*Crimp*

*Screw*



●

*Cage clamp / PushIn*

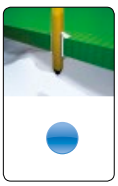


●

*Axial screw*

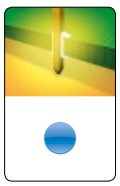
**PCB termination**

*THT*



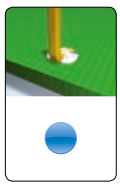
●

*SMC*



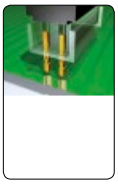
●

*SMT*



●

*Press-in*



**Application standard**

SCSI

**Housing integration**

*Separate housing*

*Integrated housing*

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| Pitches 1.27 mm / 2.54 mm | |
| PCB connectors female with IDC termination | **15.04** |
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| PCB connectors female with push-in-spring-cage termination | **15.08** |
| PCB connectors male | **15.10** |
| Pitches 3.50 mm / 3.81 mm | |
| PCB terminal blocks with push-in-spring-cage termination | **15.12** |
| PCB terminal blocks with screw termination | **15.14** |
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| PCB terminal blocks with screw termination | **15.48** |






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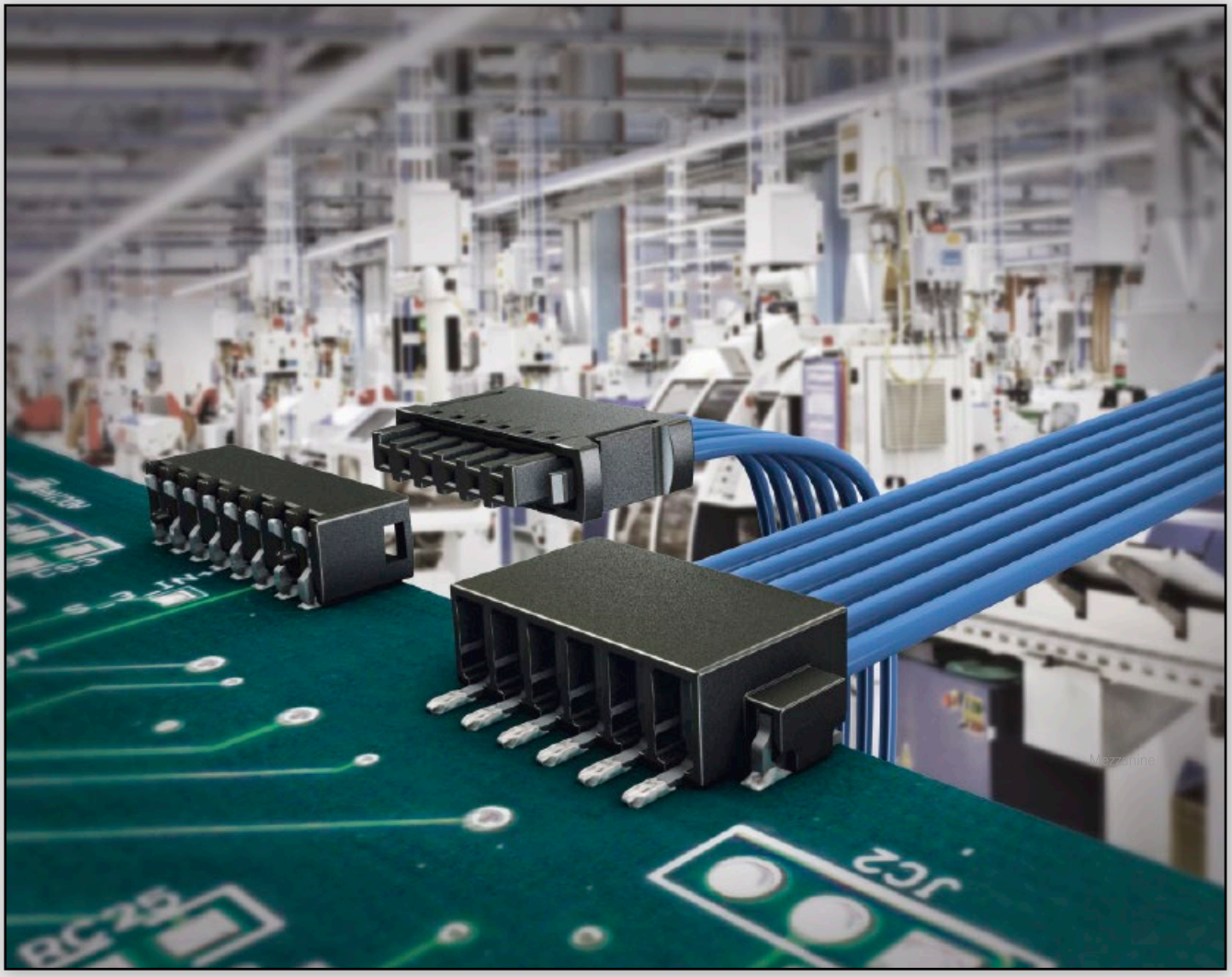
## *har*-flexicon® CONNECTORS

Innovative device connectivity technology for all lifelines of industrial devices - it routes power, data and signals through the side of the device to the PCB.

HARTING *har*-flexicon® in the pitches 1.27 mm and 2.54 mm is the miniature SMD connector for the rapid connection of single wires and provides a perfect link between the periphery and PCBs in industrial devices. HARTING is thereby continuing along the path already taken with the *har*-flex® of rethinking and methodically optimizing device connectivity technology.





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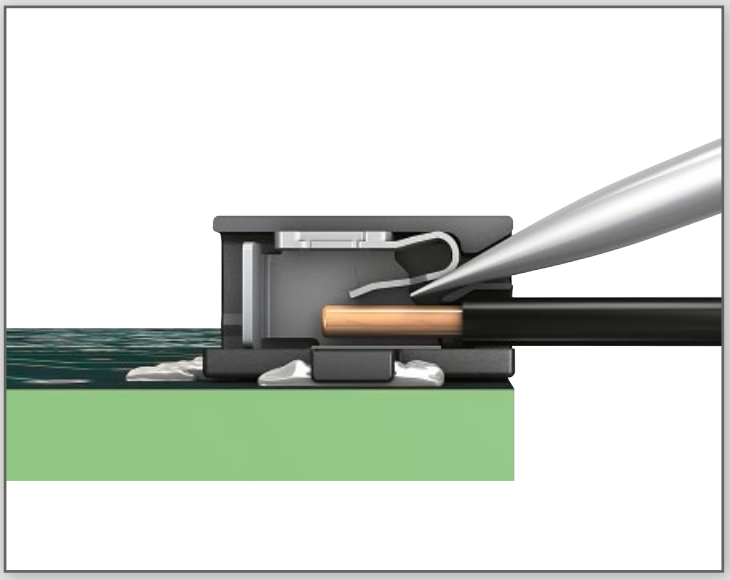
# Specific features of the product range

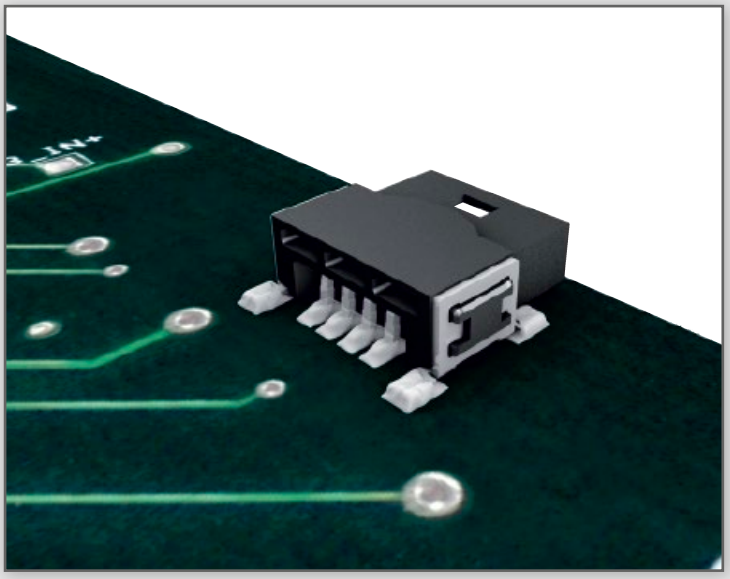
RAPID CONNECTION OF INDIVIDUAL WIRES

*har*-flexicon® is very easy and quick to use for the smallest of designs. This, in conjunction with a precise cable manager, is what the IDC and the push-in spring-cage termination technology guarantees.



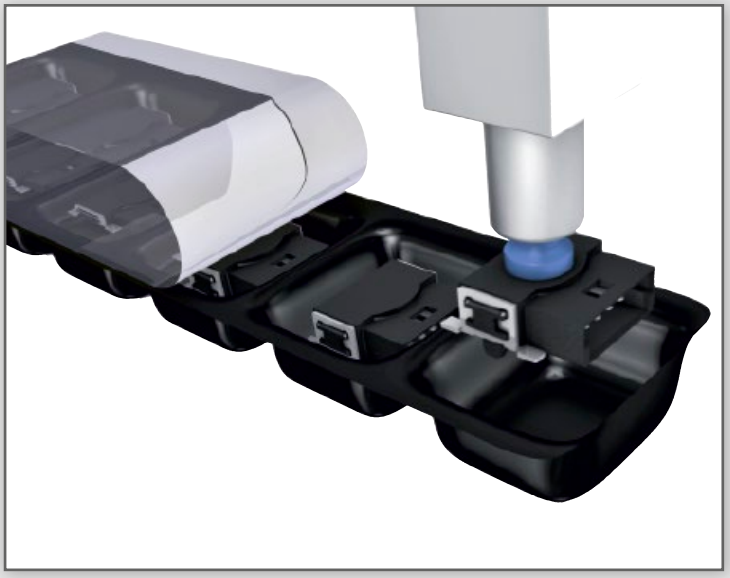
ROBUST SMD DESIGN

The large-area SMT fixings of *har*-flexicon® provide a sturdy connection to the PCB. Insertion and withdrawal forces can be absorbed in order to take the pressure off solder contacts on the connection side.



FULLY AUTOMATIC PROCESSING

The use of reflow and SMD-solderable components in automated mount and soldering processes simplifies, and hence optimizes, the production of PCBs.







Downloaded from Arrow.com.

# PCB connectors with IDC termination for SMT reflow soldering pitch 1.27 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors with IDC termination | | | |
| Female | 4 | 14 31 041 0301 000 | 50 |
| Male | 4 | 14 11 041 0002 . . . | 560 |
| Screw driver, 1.5 x 40 | | 14 99 000 0002 | |

333 000 for samples (1 piece)
for 560 pieces on reel



Downloaded from Arrow.com.

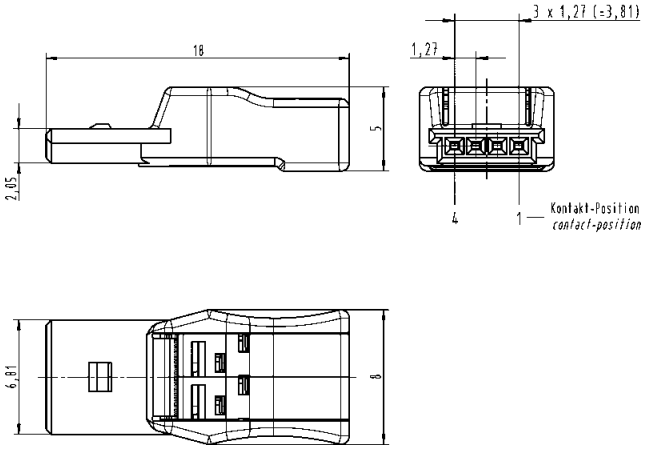
PCB connectors with IDC termination
for SMT reflow soldering
pitch 1.27 mm

Drawing

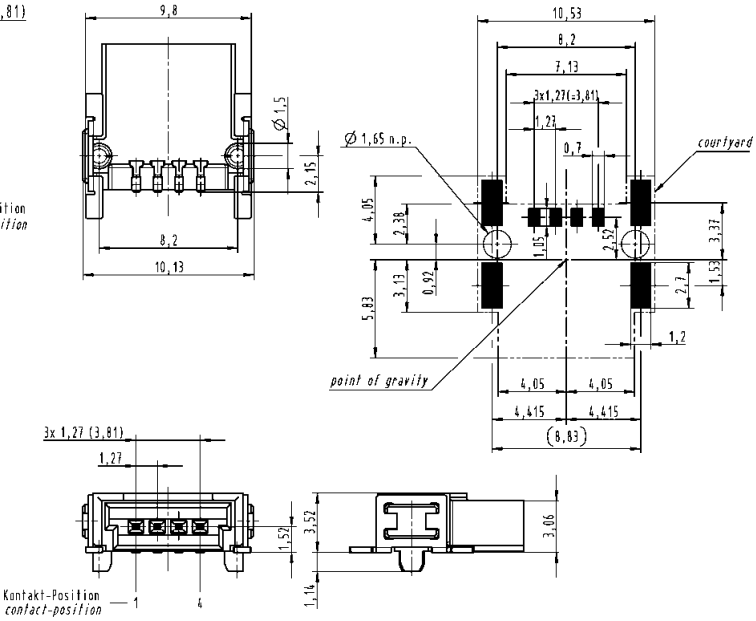
Dimensions in mm

Dimensions

female




male




## Technical characteristics

### Technical data

| | |
|---|---|
| Rated current | 2 A |
| Pitch | 1.27 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | – | – | 16 V |
| Rated surge voltage | – | – | 0.5 kV |

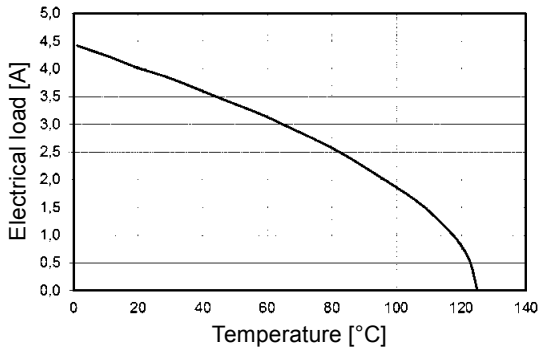
### Material data

| | |
|---|---|
| Group of insulation material | III a |
| Type of insulation material | LCP |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +125 °C |
| Contact material | Copper alloy |
| Contact plating | Nickel plated |
| | UL approval (E 102079) |

### Conductor data

| | |
|---|---|
| Connection technology wire | IDC termination |
| Conductor size solid / stranded | – / 0.05 - 0.14 mm² |
| Conductor size AWG | 28 - 26 |
| Stripping length | 0 mm |
| Conductor diameter | max. 1 mm |

### Derating

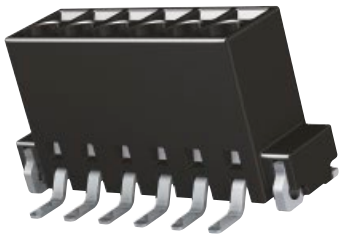


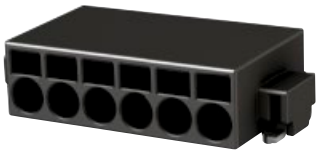

Tested with AWG 26/19



Downloaded from Arrow.com.

PCB terminal blocks,
vertical/horizontal
with push-in-spring-cage termination
for SMT reflow soldering
pitch 2.54 mm





| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| | | | vertical / horizontal |
| PCB terminal blocks, vertical/horizontal with push-in-spring-cage termination | 2 | 14 01 021 310 . . . | 250 / 500 |
| | 3 | 14 01 031 310 . . . | 250 / 500 |
| | 4 | 14 01 041 310 . . . | 250 / 500 |
| | 5 | 14 01 051 310 . . . | 250 / 500 |
| | 6 | 14 01 061 310 . . . | 250 / 500 |
| | 7 | 14 01 071 310 . . . | 250 / 500 |
| | 8 | 14 01 081 310 . . . | 250 / 500 |
| | 9 | 14 01 091 310 . . . | 250 / 500 |
| | 10 | 14 01 101 310 . . . | 250 / 500 |
| | 11 | 14 01 111 310 . . . | 250 / 500 |
| | 12 | 14 01 121 310 . . . | 250 / 500 |

Please insert digit for

vertical ▶ 1
horizontal ▶ 2



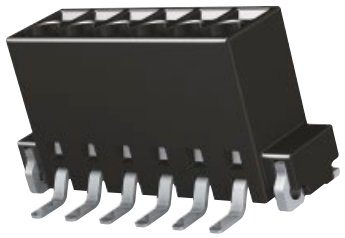


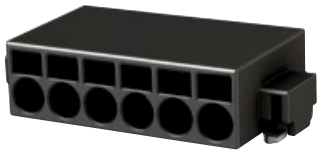
Suitable screw driver 2.0 x 40: Part number 14 99 000 0001

333
000
for samples (1 piece)
for 250/500 pieces on reel

Downloaded from Arrow.com.

PCB terminal blocks,
vertical/horizontal
with push-in-spring-cage termination
for SMT reflow soldering
pitch 2.54 mm

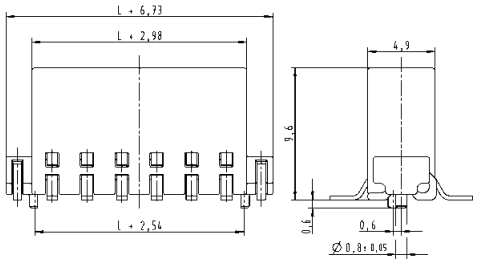


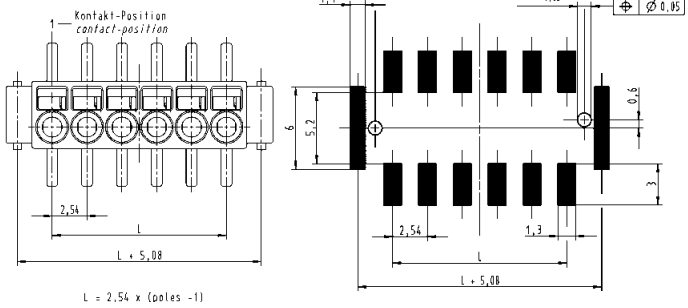


Drawing — Dimensions in mm

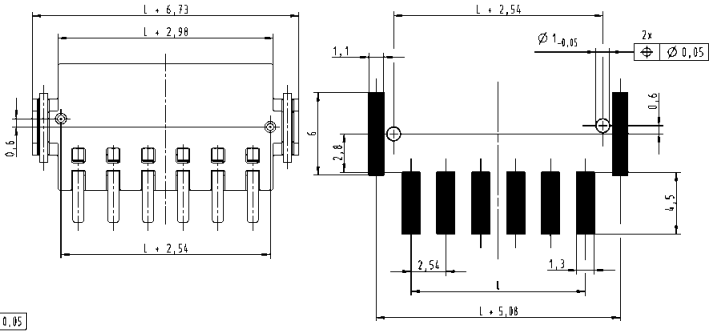
## Dimensions

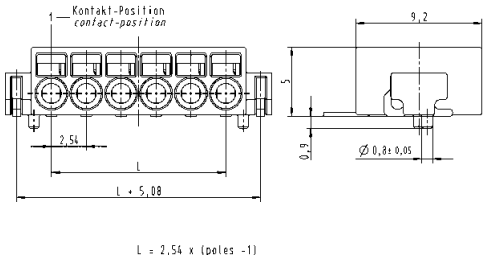
vertical




horizontal




# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 6 A |
| Pitch | 2.54 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 32 V | 160 V | 160 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Material data

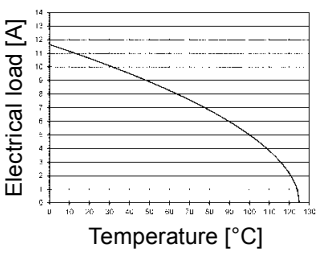
| | |
|---|---|
| Group of insulation material | III a |
| Type of insulation material | LCP |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +125 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor size<br>solid / stranded<br>stranded with ferrules without plastic sleeve | <br>0.14 - 0.5 / 0.2 - 0.5 mm²<br>0.25 - 0.34 mm² |
| Conductor size AWG | 24 - 20 |
| Stripping length | 6 mm |

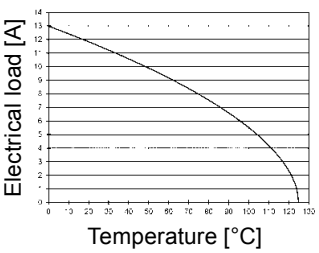
## Derating

vertical




Tested with AWG 20

horizontal




Tested with AWG 20





Downloaded from Arrow.com.

PCB connectors female,
vertical
with push-in-spring-cage termination
pitch 2.54 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors female, vertical with push-in-spring-cage termination | 2 | 14 31 021 3101 000 | 100 |
| | 3 | 14 31 031 3101 000 | 100 |
| | 4 | 14 31 041 3101 000 | 100 |
| | 5 | 14 31 051 3101 000 | 75 |
| | 6 | 14 31 061 3101 000 | 75 |
| | 7 | 14 31 071 3101 000 | 75 |
| | 8 | 14 31 081 3101 000 | 50 |
| | 9 | 14 31 091 3101 000 | 50 |
| | 10 | 14 31 101 3101 000 | 50 |
| | 11 | 14 31 111 3101 000 | 25 |
| | 12 | 14 31 121 3101 000 | 25 |

Suitable screw driver 2.0 x 40: Part number 14 99 000 0001



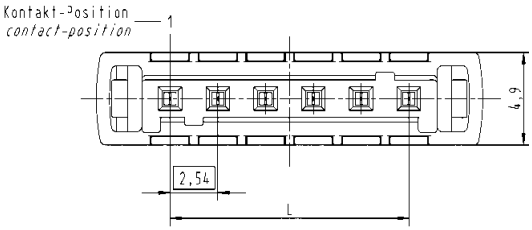
Downloaded from Arrow.com.

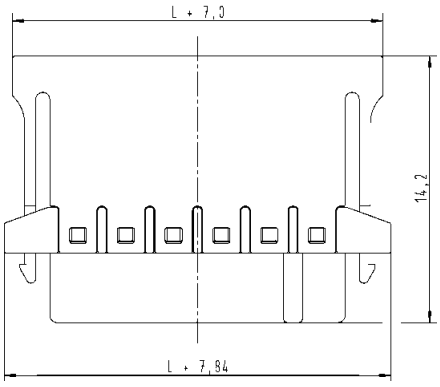
PCB connectors female,
vertical
with push-in-spring-cage termination
pitch 2.54 mm

Drawing

Dimensions in mm

Dimensions




L = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 6 A |
| Pitch | 2.54 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 32 V | 160 V | 160 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

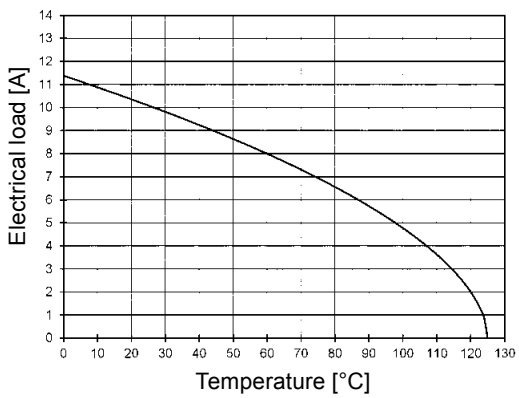
## Material data

| | |
|---|---|
| Group of insulation material | III a |
| Type of insulation material | LCP |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +125 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor size | |
| solid / stranded | 0.14 - 0.5 / 0.2 - 0.5 mm² |
| stranded with ferrules without plastic sleeve | 0.25 - 0.34 mm² |
| Conductor size AWG | 24 - 20 |
| Stripping length | 6 mm |

## Derating




Tested with AWG 20



Downloaded from Arrow.com.

# PCB connectors male, vertical/horizontal for SMT reflow soldering pitch 2.54 mm

| Identification | No. of contacts | Part number | | Packaging unit (pieces) |
|---|---|---|---|---|
| PCB connectors male, vertical/horizontal | | | | vertical / horizontal |
| | 2 | 14 11 021 300 | . . . | 500 / 600 |
| | 3 | 14 11 031 300 | . . . | 500 / 600 |
| | 4 | 14 11 041 300 | . . . | 500 / 600 |
| | 5 | 14 11 051 300 | . . . | 500 / 600 |
| | 6 | 14 11 061 300 | . . . | 500 / 600 |
| | 7 | 14 11 071 300 | . . . | 500 / 600 |
| | 8 | 14 11 081 300 | . . . | 500 / 600 |
| | 9 | 14 11 091 300 | . . . | 500 / 600 |
| | 10 | 14 11 101 300 | . . . | 500 / 600 |
| | 11 | 14 11 111 300 | . . . | 500 / 600 |
| | 12 | 14 11 121 300 | . . . | 500 / 600 |

Please insert digit for

vertical ▶ 1
horizontal ▶ 2

333 000 for samples (1 piece)
for 500/600 pieces on reel



Downloaded from Arrow.com.

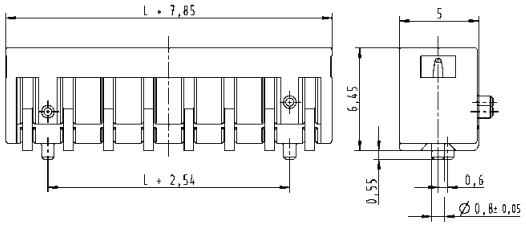
PCB connectors male,
vertical/horizontal
for SMT reflow soldering
pitch 2.54 mm

Drawing

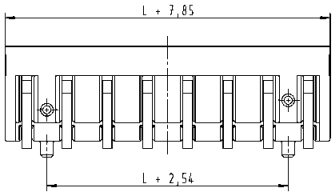
Dimensions in mm

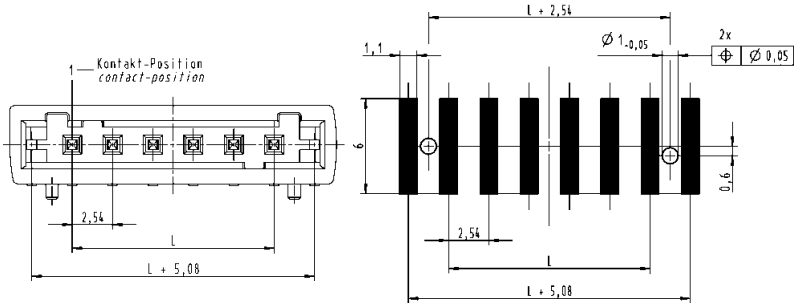
Dimensions

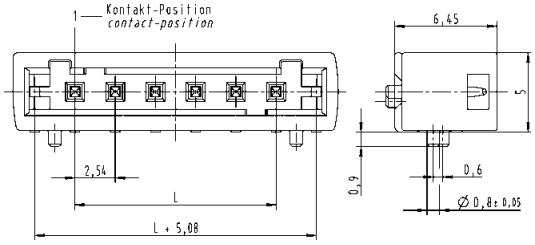
vertical




horizontal




L = pitch x (poles - 1)

# Technical characteristics

## Technical data

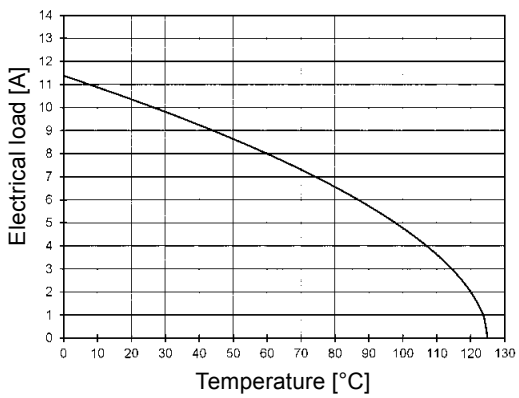
| | |
|---|---|
| Rated current | 6 A |
| Pitch | 2.54 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 32 V | 160 V | 160 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Material data

| | |
|---|---|
| Group of insulation material | III a |
| Type of insulation material | LCP |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +125 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Derating

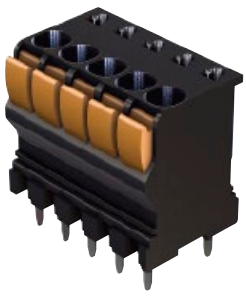



Tested
with AWG 20



Downloaded from Arrow.com.

PCB terminal blocks,
vertical with push-in-spring-cage termination
for reflow soldering
pitch 3.50 / 3.81 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB terminal blocks, vertical with push-in-spring-cage termination | 2 | 14 02 021 . 101 . . . | 100 |
| | 3 | 14 02 031 . 101 . . . | 100 |
| | 4 | 14 02 041 . 101 . . . | 75 |
| | 5 | 14 02 051 . 101 . . . | 75 |
| | 6 | 14 02 061 . 101 . . . | 50 |
| | 7 | 14 02 071 . 101 . . . | 50 |
| | 8 | 14 02 081 . 101 . . . | 50 |
| | 9 | 14 02 091 . 101 . . . | 50 |
| | 10 | 14 02 101 . 101 . . . | 50 |
| | 11 | 14 02 111 . 101 . . . | 50 |
| | 12 | 14 02 121 . 101 . . . | 50 |
| | 13 | 14 02 131 . 101 . . . | 50 |
| | 14 | 14 02 141 . 101 . . . | 50 |
| | 15 | 14 02 151 . 101 . . . | 50 |
| | 16 | 14 02 161 . 101 . . . | 50 |

Please insert digit for

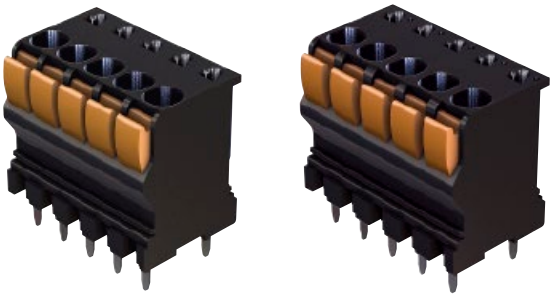
pitch 3.50 mm ▶ 4
pitch 3.81 mm ▶ 5

for samples (1 piece) 333
for a packaging unit 000



Downloaded from Arrow.com.

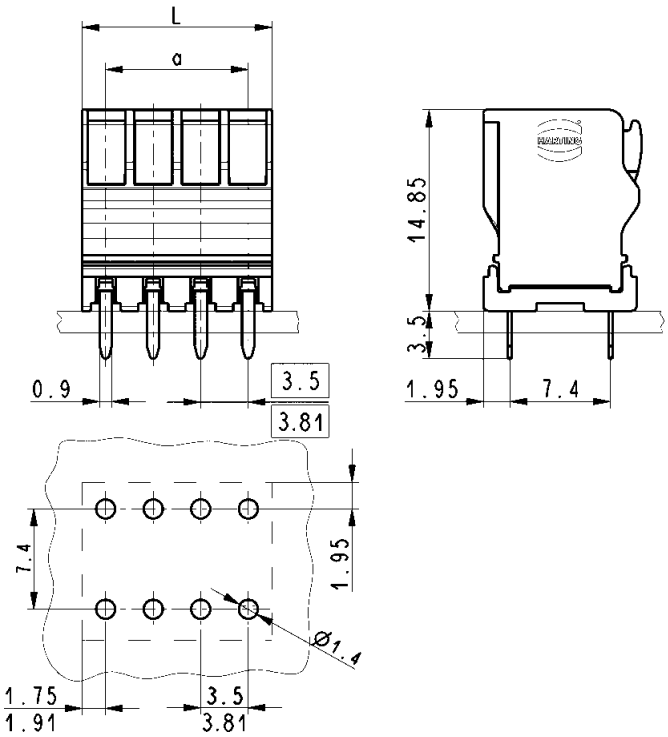
PCB terminal blocks,
vertical with push-in-spring-cage termination
for reflow soldering
pitch 3.50 / 3.81 mm



Drawing

Dimensions in mm

Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 10 A |
| Pitch | 3.50 mm / 3.81 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 220 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor and solder pin data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor size<br>solid / stranded<br>stranded with ferrules<br>without / with plastic sleeve | <br>0.14 - 1.5 / 0.14 - 1.5 mm²<br><br>0.50 - 1.5 / 0.10 - 1.5 mm² |
| Conductor size AWG | 30 - 16 |
| Stripping length | 9 - 10 mm |
| Solder pin: drilled hole diameter | 1.4 mm |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 10 A | – | 10 A |





Downloaded from Arrow.com.

# PCB terminal blocks, horizontal with screw termination for reflow soldering pitch 3.50 / 3.81 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB terminal blocks, horizontal with screw termination | | | |
| | 2 | 14 02 021 . 402 . . . | 100 |
| | 3 | 14 02 031 . 402 . . . | 100 |
| | 4 | 14 02 041 . 402 . . . | 75 |
| | 5 | 14 02 051 . 402 . . . | 75 |
| | 6 | 14 02 061 . 402 . . . | 50 |
| | 7 | 14 02 071 . 402 . . . | 50 |
| | 8 | 14 02 081 . 402 . . . | 50 |
| | 9 | 14 02 091 . 402 . . . | 50 |
| | 10 | 14 02 101 . 402 . . . | 50 |
| | 11 | 14 02 111 . 402 . . . | 50 |
| | 12 | 14 02 121 . 402 . . . | 50 |

Please insert digit for

pitch 3.50 mm ▶ 4

pitch 3.81 mm ▶ 5

for samples (1 piece) 333
for a packaging unit 000



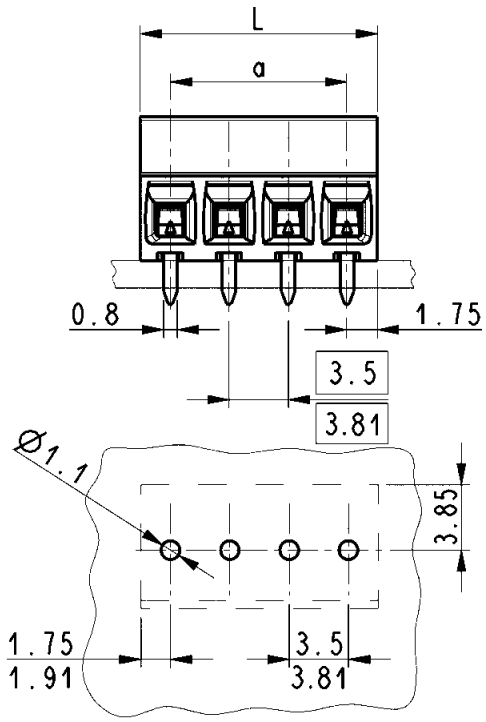
Downloaded from Arrow.com.

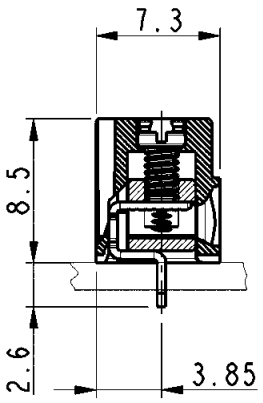
PCB terminal blocks,
horizontal with screw termination
for reflow soldering
pitch 3.50 / 3.81 mm

Drawing

Dimensions in mm

Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 12 A |
| Pitch | 3.50 mm / 3.81 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 150 V | 150 V | 300 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Conductor and solder pin data

| | |
|---|---|
| Connection technology wire | screw termination |
| Conductor | |
| size solid / stranded | 0.05 - 1.5 / 0.05 - 1 mm² |
| stranded with ferrules without / with plastic sleeve | 0.50 - 1 / 0.10 - 1 mm² |
| Conductor size AWG | 28 - 16 |
| Screw thread | M2 |
| Tightening torque | 0.2 - 0,25 Nm |
| Stripping length | 5 - 6 mm |
| Solder pin: drilled hole diameter | 1.1 mm |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

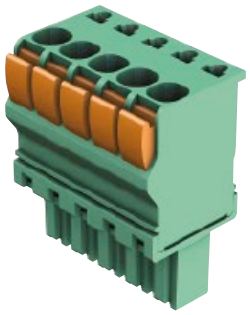
## Approval data (UL)

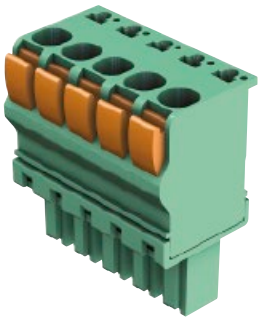
| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 12 A | – | 12 A |





Downloaded from Arrow.com.





# PCB connectors female, horizontal with push-in-spring-cage termination pitch 3.50 / 3.81 mm

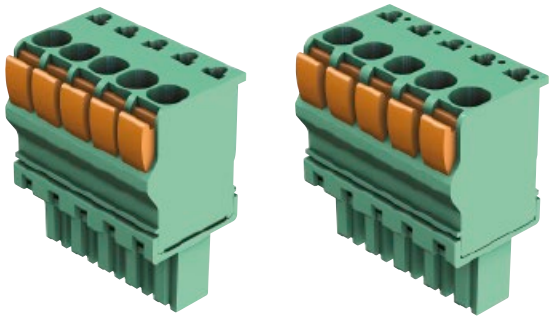
| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors female, horizontal with push-in-spring-cage termination | 2 | 14 31 021 . 102 000 | 300 |
| | 3 | 14 31 031 . 102 000 | 200 |
| | 4 | 14 31 041 . 102 000 | 150 |
| | 5 | 14 31 051 . 102 000 | 150 |
| | 6 | 14 31 061 . 102 000 | 100 |
| | 7 | 14 31 071 . 102 000 | 100 |
| | 8 | 14 31 081 . 102 000 | 100 |
| | 9 | 14 31 091 . 102 000 | 100 |
| | 10 | 14 31 101 . 102 000 | 100 |
| | 11 | 14 31 111 . 102 000 | 100 |
| | 12 | 14 31 121 . 102 000 | 100 |
| | 13 | 14 31 131 . 102 000 | 50 |
| | 14 | 14 31 141 . 102 000 | 50 |
| | 15 | 14 31 151 . 102 000 | 50 |
| | 16 | 14 31 161 . 102 000 | 50 |
| | 17 | 14 31 171 . 102 000 | 50 |
| | 18 | 14 31 181 . 102 000 | 50 |
| | 19 | 14 31 191 . 102 000 | 50 |
| | 20 | 14 31 201 . 102 000 | 50 |
| | 21* | 14 31 211 . 102 000 | 25 |
| | 22* | 14 31 221 . 102 000 | 25 |
| | 23* | 14 31 231 . 102 000 | 25 |
| | 24* | 14 31 241 . 102 000 | 25 |
| | 25* | 14 31 251 . 102 000 | 25 |
| Please insert digit for<br>pitch 3.50 mm ▶ 4<br>pitch 3.81 mm ▶ 5 | | | |
| Coding keys | | 14 95 000 0050 000 | 120 |

* Pitch 3.50 mm only available with 2-20 contacts



Downloaded from Arrow.com.

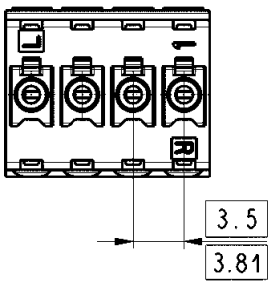
PCB connectors female,
horizontal
with push-in-spring-cage termination
pitch 3.50 / 3.81 mm

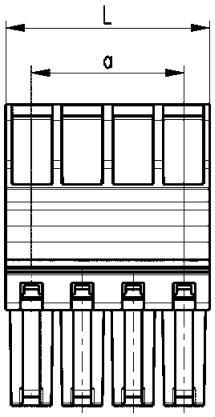


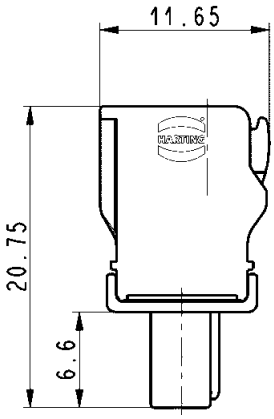
Drawing

Dimensions in mm

Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 11 A |
| Pitch | 3.50 mm / 3.81 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 150 V | 150 V | 300 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor<br>size solid / stranded<br>stranded with ferrules<br>without / with plastic sleeve | <br>0.14 - 1.5 / 0.14 - 1.5 mm²<br><br>0.50 - 1.5 / 0.10 - 1.5 mm² |
| Conductor size AWG | 30 - 14 |
| Stripping length | 9 - 10 mm |

## Approval data (UL)

| Use group | | B | C | D |
|---|---|---|---|---|
| Rated voltage | | 300 V | – | – |
| Rated current | solid | 9 A | – | – |
| | stranded | 11 A | – | – |



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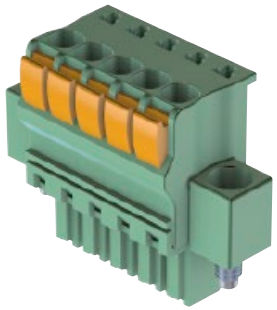
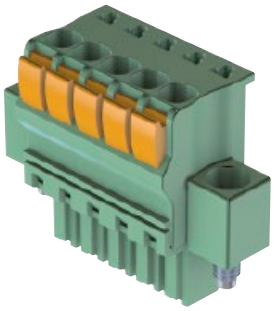
# PCB connectors female with screw flange, horizontal with push-in-spring-cage termination pitch 3.50 / 3.81 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors female with screw flange, horizontal with push-in-spring-cage termination | 2 | 14 31 021 . 106 000 | 300 |
| | 3 | 14 31 031 . 106 000 | 200 |
| | 4 | 14 31 041 . 106 000 | 150 |
| | 5 | 14 31 051 . 106 000 | 150 |
| | 6 | 14 31 061 . 106 000 | 100 |
| | 7 | 14 31 071 . 106 000 | 100 |
| | 8 | 14 31 081 . 106 000 | 100 |
| | 9 | 14 31 091 . 106 000 | 100 |
| | 10 | 14 31 101 . 106 000 | 100 |
| | 11 | 14 31 111 . 106 000 | 100 |
| | 12 | 14 31 121 . 106 000 | 100 |
| | 13 | 14 31 131 . 106 000 | 50 |
| | 14 | 14 31 141 . 106 000 | 50 |
| | 15 | 14 31 151 . 106 000 | 50 |
| | 16 | 14 31 161 . 106 000 | 50 |
| | 17 | 14 31 171 . 106 000 | 50 |
| | 18 | 14 31 181 . 106 000 | 50 |
| | 19 | 14 31 191 . 106 000 | 50 |
| | 20 | 14 31 201 . 106 000 | 50 |
| | 21 | 14 31 211 . 106 000 | 50 |
| | 22 | 14 31 221 . 106 000 | 50 |
| Please insert digit for<br>pitch 3.50 mm ▶ 4<br>pitch 3.81 mm ▶ 5 | | | |
| Coding keys | | 14 95 000 0050 000 | 120 |



Downloaded from Arrow.com.

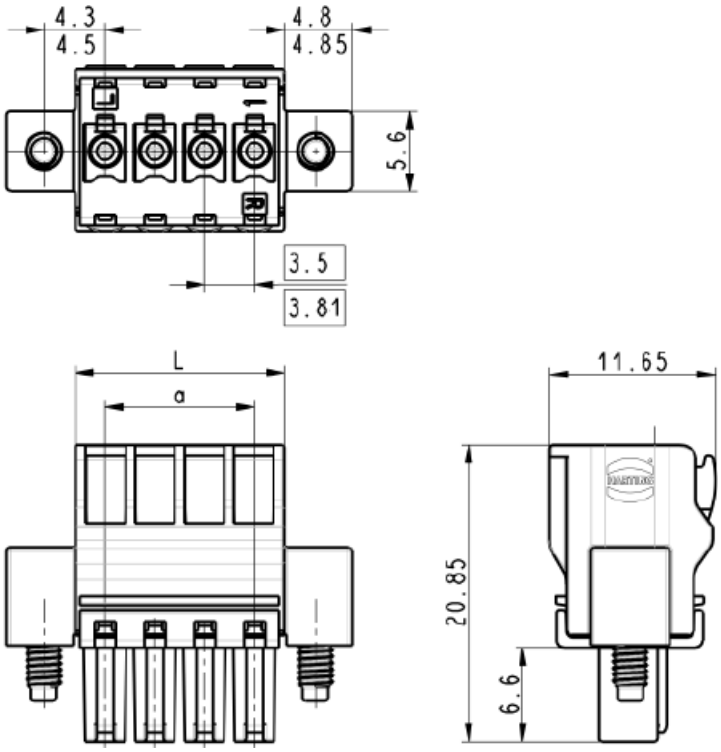


PCB connectors female with screw flange,
horizontal
with push-in-spring-cage termination
pitch 3.50 / 3.81 mm

Drawing

Dimensions in mm

Dimensions




L = (pitch x poles) + 0.7 mm
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 11 A |
| Pitch | 3.50 mm / 3.81 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 150 V | 150 V | 300 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |
| Screw flange | M2.5 |

## Conductor data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor | |
| size solid / stranded | 0.14 - 1.5 / 0.14 - 1.5 mm² |
| stranded with ferrules without / with plastic sleeve | 0.50 - 1.5 / 0.10 - 1.5 mm² |
| Conductor size AWG | 30 - 14 |
| Stripping length | 9 - 10 mm |

## Approval data (UL)

| Use group | | B | C | D |
|---|---|---|---|---|
| Rated voltage | | 300 V | – | – |
| Rated current | solid | 9 A | – | – |
| | stranded | 11 A | – | – |





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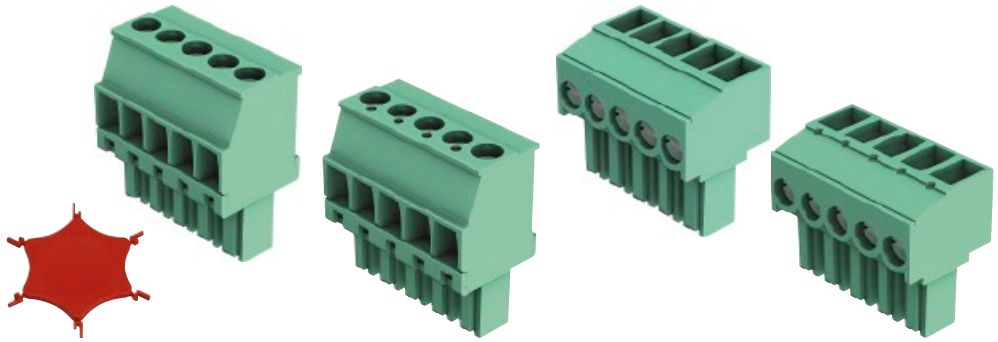
# PCB connectors female, vertical/horizontal with screw termination pitch 3.50 / 3.81 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors female, vertical/horizontal with screw termination | 2 | 14 31 021 . 40 . 000 | 300 |
| | 3 | 14 31 031 . 40 . 000 | 200 |
| | 4 | 14 31 041 . 40 . 000 | 150 |
| | 5 | 14 31 051 . 40 . 000 | 150 |
| | 6 | 14 31 061 . 40 . 000 | 100 |
| | 7 | 14 31 071 . 40 . 000 | 100 |
| | 8 | 14 31 081 . 40 . 000 | 100 |
| | 9 | 14 31 091 . 40 . 000 | 100 |
| | 10 | 14 31 101 . 40 . 000 | 100 |
| | 11 | 14 31 111 . 40 . 000 | 100 |
| | 12 | 14 31 121 . 40 . 000 | 100 |
| | 13 | 14 31 131 . 40 . 000 | 50 |
| | 14 | 14 31 141 . 40 . 000 | 50 |
| | 15 | 14 31 151 . 40 . 000 | 50 |
| | 16 | 14 31 161 . 40 . 000 | 50 |
| | 17* | 14 31 171 . 40 . 000 | 50 |
| | 18* | 14 31 181 . 40 . 000 | 50 |
| | 19* | 14 31 191 . 40 . 000 | 50 |
| | 20* | 14 31 201 . 40 . 000 | 50 |
| | 21* | 14 31 211 . 40 . 000 | 25 |
| | 22* | 14 31 221 . 40 . 000 | 25 |
| | 23* | 14 31 231 . 40 . 000 | 25 |
| | 24* | 14 31 241 . 40 . 000 | 25 |
| | 25* | 14 31 251 . 40 . 000 | 25 |

Please insert digit for

pitch 3.50 mm ▶ 4
pitch 3.81 mm ▶ 5

vertical ▶ 1
horizontal ▶ 2

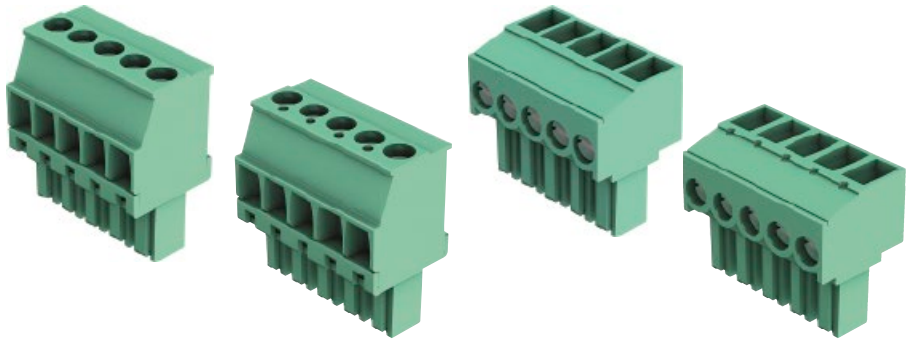
| | | |
|---|---|---|
| Coding keys | 14 95 000 0050 000 | 120 |

* Pitch 3.81 mm (vertical) only available with 2-16 contacts



Downloaded from Arrow.com.

PCB connectors female,
vertical/horizontal
with screw termination
pitch 3.50 / 3.81 mm

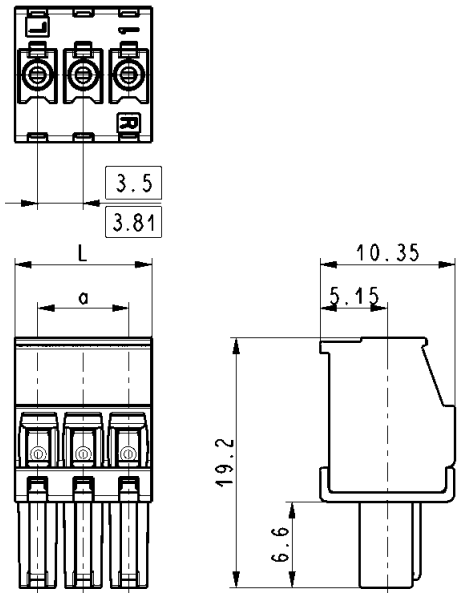


Drawing

Dimensions in mm

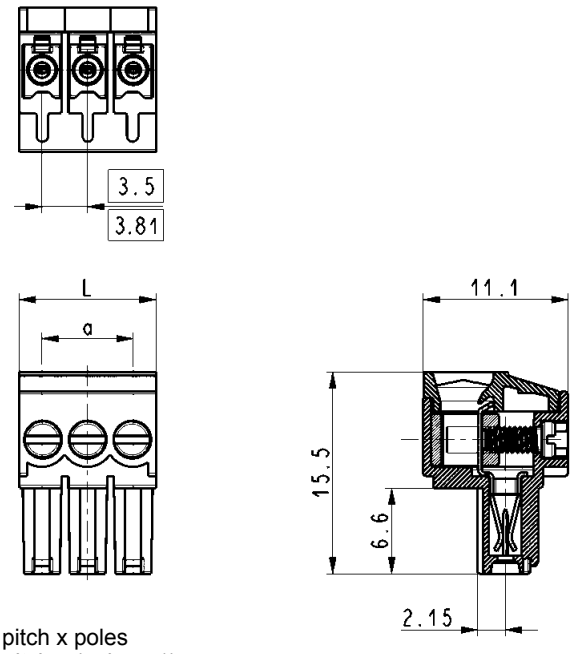
## Dimensions

vertical




L = pitch x poles
a = pitch x (poles - 1)

horizontal




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 10 A |
| Pitch | 3.50 mm / 3.81 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 150 V | 150 V | 300 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor data

| | |
|---|---|
| Connection technology wire | screw termination |
| Conductor | |
| size solid / stranded | 0.05 - 1.5 / 0.05 - 1 mm² |
| stranded with ferrules without / with plastic sleeve | 0.50 - 1 / 0.10 - 1 mm² |
| Conductor size AWG | 30 - 14 |
| Screw thread | M2 |
| Tightening torque | 0.2 - 0.25 Nm |
| Stripping length | 5.0 - 6.0 mm |

## Approval data (UL)

| Use group | | B | C | D |
|---|---|---|---|---|
| Rated voltage | | 300 V | – | 300 V |
| Rated current | vertical | 10 A | – | 10 A |
| | horizontal | 11 A | – | 11 A |





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PCB connectors male,
vertical
for wave soldering
pitch 3.50 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| Connectors, male, vertical | | | |
| | 2 | 14 13 021 4001 000 | 100 |
| | 3 | 14 13 031 4001 000 | 100 |
| | 4 | 14 13 041 4001 000 | 75 |
| | 5 | 14 13 051 4001 000 | 75 |
| | 6 | 14 13 061 4001 000 | 50 |
| | 7 | 14 13 071 4001 000 | 50 |
| | 8 | 14 13 081 4001 000 | 50 |
| | 9 | 14 13 091 4001 000 | 50 |
| | 10 | 14 13 101 4001 000 | 50 |
| | 11 | 14 13 111 4001 000 | 50 |
| | 12 | 14 13 121 4001 000 | 50 |
| Coding keys | | 14 95 000 0052 000 | 120 |



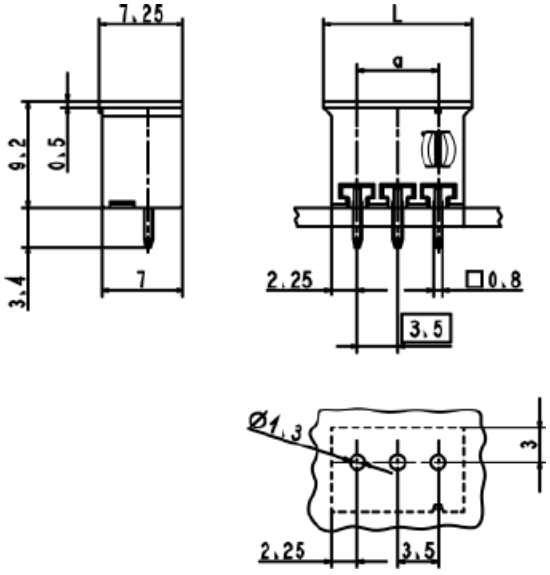
Downloaded from Arrow.com.

PCB connectors male,
vertical
for wave soldering
pitch 3.50 mm

Drawing

Dimensions in mm

## Dimensions




L = (pitch x poles) + 2.3 mm
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 11 A |
| Pitch | 3.50 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 150 V | 150 V | 300 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Solder pin data

| | |
|---|---|
| Solder pin: drilled hole diameter | 1.3 mm |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 11 A | – | 11 A |





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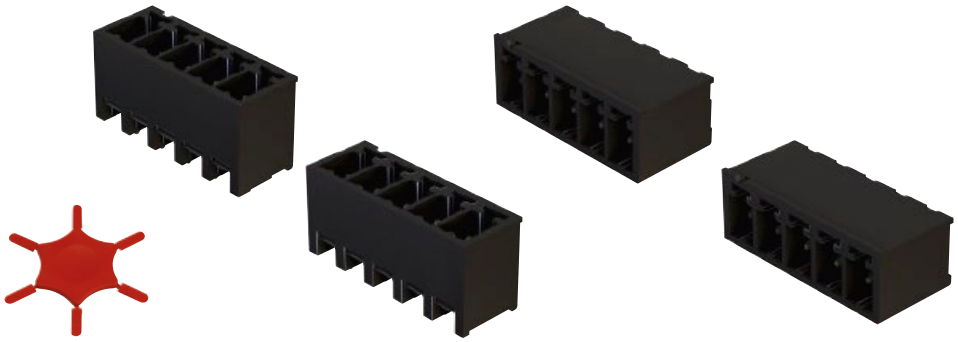
# PCB connectors male, vertical/horizontal for reflow soldering pitch 3.50 / 3.81 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| Connectors, male, vertical/horizontal | | | |
| | 2 | 14 12 021 . 00 . ... | 100 |
| | 3 | 14 12 031 . 00 . ... | 100 |
| | 4 | 14 12 041 . 00 . ... | 75 |
| | 5 | 14 12 051 . 00 . ... | 75 |
| | 6 | 14 12 061 . 00 . ... | 50 |
| | 7 | 14 12 071 . 00 . ... | 50 |
| | 8 | 14 12 081 . 00 . ... | 50 |
| | 9 | 14 12 091 . 00 . ... | 50 |
| | 10 | 14 12 101 . 00 . ... | 50 |
| | 11 | 14 12 111 . 00 . ... | 50 |
| | 12 | 14 12 121 . 00 . ... | 50 |
| | 13 | 14 12 131 . 00 . ... | 50 |
| | 14 | 14 12 141 . 00 . ... | 50 |
| | 15 | 14 12 151 . 00 . ... | 50 |
| | 16 | 14 12 161 . 00 . ... | 50 |
| | 17 | 14 12 171 . 00 . ... | 50 |
| | 18 | 14 12 181 . 00 . ... | 50 |
| | 19 | 14 12 191 . 00 . ... | 50 |
| | 20 | 14 12 201 . 00 . ... | 50 |
| | 21 | 14 12 211 . 00 . ... | 25 |
| | 22 | 14 12 221 . 00 . ... | 25 |
| | 23 | 14 12 231 . 00 . ... | 25 |
| | 24 | 14 12 241 . 00 . ... | 25 |
| | 25 | 14 12 251 . 00 . ... | 25 |

Please insert digit for

| | |
|---|---|
| pitch 3.50 mm ▶ | 4 |
| pitch 3.81 mm ▶ | 5 |
| vertical ▶ | 1 |
| horizontal ▶ | 2 |

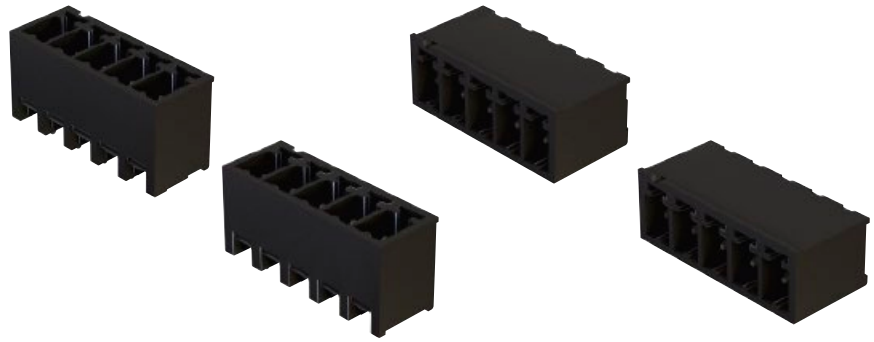
| | | | |
|---|---|---|---|
| Coding keys | | 14 95 000 0052 000 | 120 |

for samples (1 piece) / for a packaging unit: 333 000



Downloaded from Arrow.com.

PCB connectors male,
vertical/horizontal
for reflow soldering
pitch 3.50 / 3.81 mm

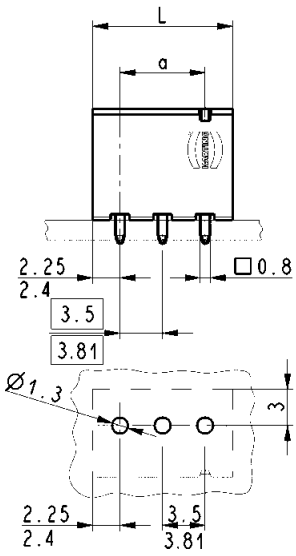


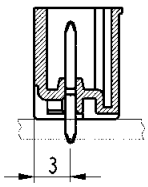
Drawing

Dimensions in mm

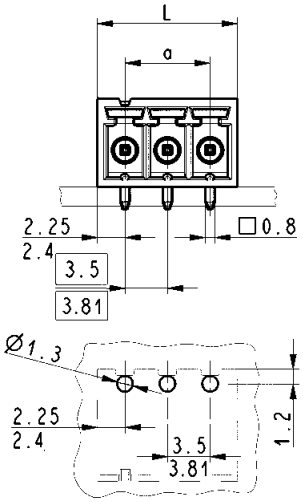
## Dimensions

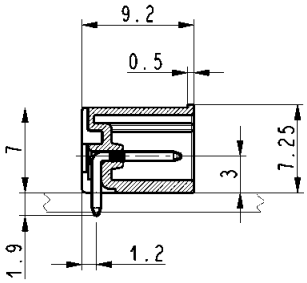
vertical




horizontal




L = (pitch x poles) + 1 mm
a = pitch x (poles - 1)

L = (pitch x poles) + 1 mm
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 11 A |
| Pitch | 3.50 mm / 3.81 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 150 V | 150 V | 300 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Solder pin data

| | |
|---|---|
| Solder pin: drilled hole diameter | 1.3 mm |

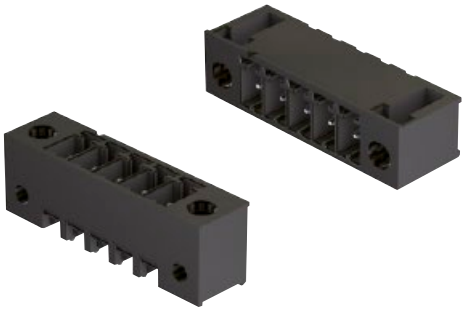
## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 11 A | – | 11 A |



Downloaded from Arrow.com.

# PCB connectors male with thread flange, vertical/horizontal for reflow soldering pitch 3.50 / 3.81 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors male with thread flange, vertical/horizontal | | | |
| | 2 | 14 12 021 . 00 . ... | 100 |
| | 3 | 14 12 031 . 00 . ... | 100 |
| | 4 | 14 12 041 . 00 . ... | 75 |
| | 5 | 14 12 051 . 00 . ... | 75 |
| | 6 | 14 12 061 . 00 . ... | 50 |
| | 7 | 14 12 071 . 00 . ... | 50 |
| | 8 | 14 12 081 . 00 . ... | 50 |
| | 9 | 14 12 091 . 00 . ... | 50 |
| | 10 | 14 12 101 . 00 . ... | 50 |
| | 11 | 14 12 111 . 00 . ... | 50 |
| | 12 | 14 12 121 . 00 . ... | 50 |
| | 13 | 14 12 131 . 00 . ... | 50 |
| | 14 | 14 12 141 . 00 . ... | 50 |
| | 15 | 14 12 151 . 00 . ... | 50 |
| | 16 | 14 12 161 . 00 . ... | 50 |
| | 17 | 14 12 171 . 00 . ... | 50 |
| | 18 | 14 12 181 . 00 . ... | 50 |
| | 19 | 14 12 191 . 00 . ... | 50 |
| | 20 | 14 12 201 . 00 . ... | 50 |
| | 21 | 14 12 211 . 00 . ... | 25 |
| | 22 | 14 12 221 . 00 . ... | 25 |

Please insert digit for

pitch 3.50 mm ▶ 4
pitch 3.81 mm ▶ 5

vertical ▶ 5
horizontal ▶ 6

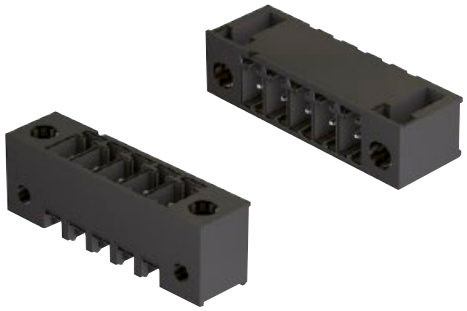
| | | |
|---|---|---|
| Coding keys | 14 95 000 0052 000 | 120 |

for samples (1 piece) / for a packaging unit 333 000



Downloaded from Arrow.com.

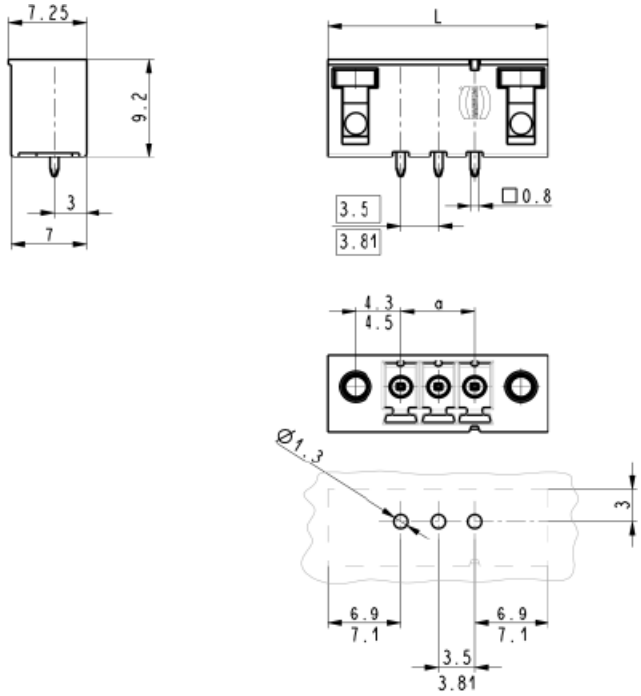
PCB connectors male
with thread flange,
vertical/horizontal
for reflow soldering
pitch 3.50 / 3.81 mm



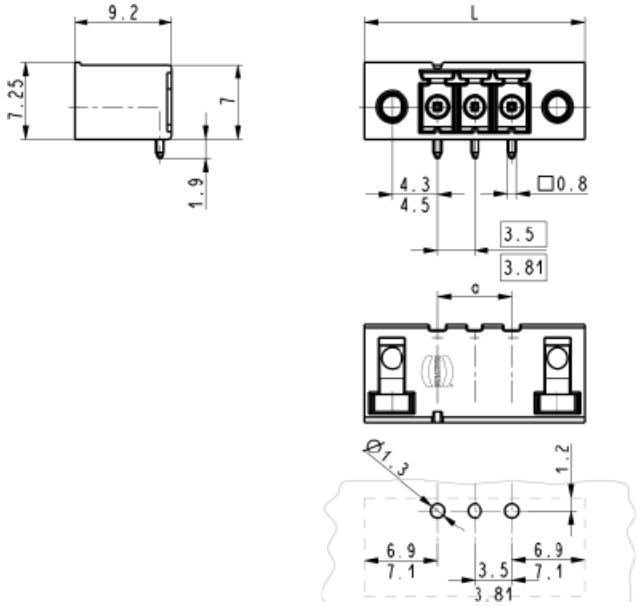
Drawing — Dimensions in mm

## Dimensions

vertical




horizontal




Pitch 3.50 mm: L = (3.50 mm x poles) + 10.3 mm
Pitch 3.81 mm: L = (3.81 mm x poles) + 10.39 mm
a = pitch x (poles - 1)

Pitch 3.50 mm: L = (3.50 mm x poles) + 10.3 mm
Pitch 3.81 mm: L = (3.81 mm x poles) + 10.39 mm
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 11 A |
| Pitch | 3.50 mm / 3.81 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 150 V | 150 V | 300 V |
| Rated surge voltage | 2.5 kV | 2.5 kV | 2.5 kV |

## Solder pin data

| | |
|---|---|
| Solder pin: drilled hole diameter | 1.3 mm |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |
| Thread flange | M2.5 |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 11 A | – | 11 A |





Downloaded from Arrow.com.

PCB terminal blocks,
vertical with push-in-spring-cage termination
for wave soldering
pitch 5.00 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB terminal blocks, vertical with push-in-spring-cage termination | 2 | 14 03 021 6101 000 | 300 |
| | 3 | 14 03 031 6101 000 | 200 |
| | 4 | 14 03 041 6101 000 | 150 |
| | 5 | 14 03 051 6101 000 | 150 |
| | 6 | 14 03 061 6101 000 | 100 |
| | 7 | 14 03 071 6101 000 | 100 |
| | 8 | 14 03 081 6101 000 | 100 |
| | 9 | 14 03 091 6101 000 | 100 |
| | 10 | 14 03 101 6101 000 | 100 |
| | 11 | 14 03 111 6101 000 | 100 |
| | 12 | 14 03 121 6101 000 | 100 |
| | 13 | 14 03 131 6101 000 | 50 |
| | 14 | 14 03 141 6101 000 | 50 |
| | 15 | 14 03 151 6101 000 | 50 |
| | 16 | 14 03 161 6101 000 | 50 |
| | 17 | 14 03 171 6101 000 | 50 |
| | 18 | 14 03 181 6101 000 | 50 |

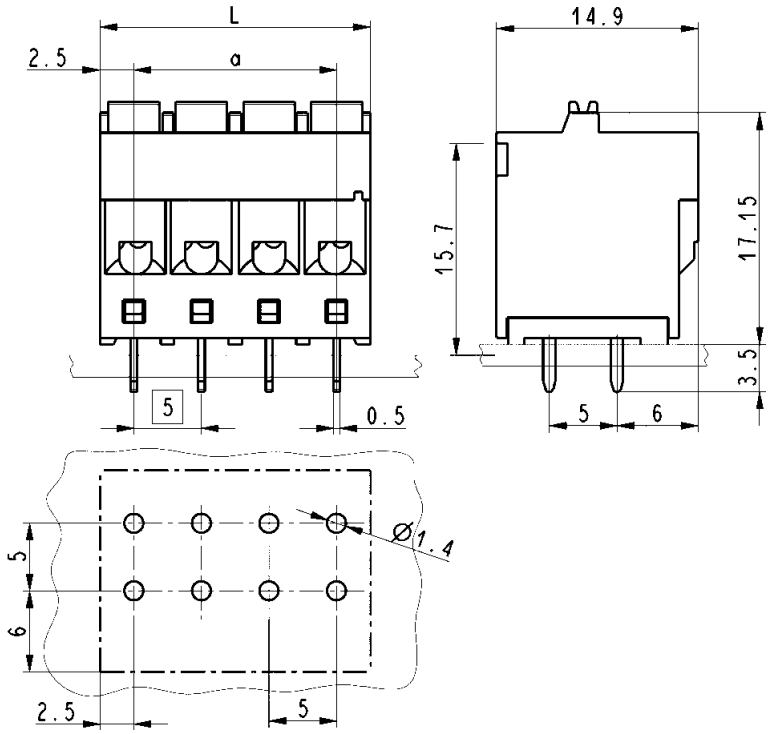


Downloaded from Arrow.com.

PCB terminal blocks,
vertical with push-in-spring-cage termination
for wave soldering
pitch 5.00 mm

Drawing — Dimensions in mm

## Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 12 A |
| Pitch | 5.00 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 300 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor and solder pin data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor size<br>solid / stranded<br>stranded with ferrules<br>without / with plastic sleeve | <br>0.2 - 2.5 / 0.2 - 2.5 mm²<br><br>0.5 - 2.5 / 0.5 - 2.5 mm² |
| Conductor size AWG | 30 - 12 |
| Stripping length | 10 mm |
| Solder pin: drilled hole diameter | 1.4 mm |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 12 A | – | 12 A |





Downloaded from Arrow.com.

PCB terminal blocks,
vertical with push-in-spring-cage termination
for reflow soldering
pitch 5.00 mm

| Identification | No. of contacts | Part number | | Packaging unit (pieces) |
|---|---|---|---|---|
| PCB terminal blocks, stackable, vertical with push-in-spring-cage termination | | | | |
| | 2 | 14 02 021 6101 | . . . | 100 |
| | 3 | 14 02 031 6101 | . . . | 100 |
| | 4 | 14 02 041 6101 | . . . | 75 |

for samples (1 piece)
for a packaging unit 333 000



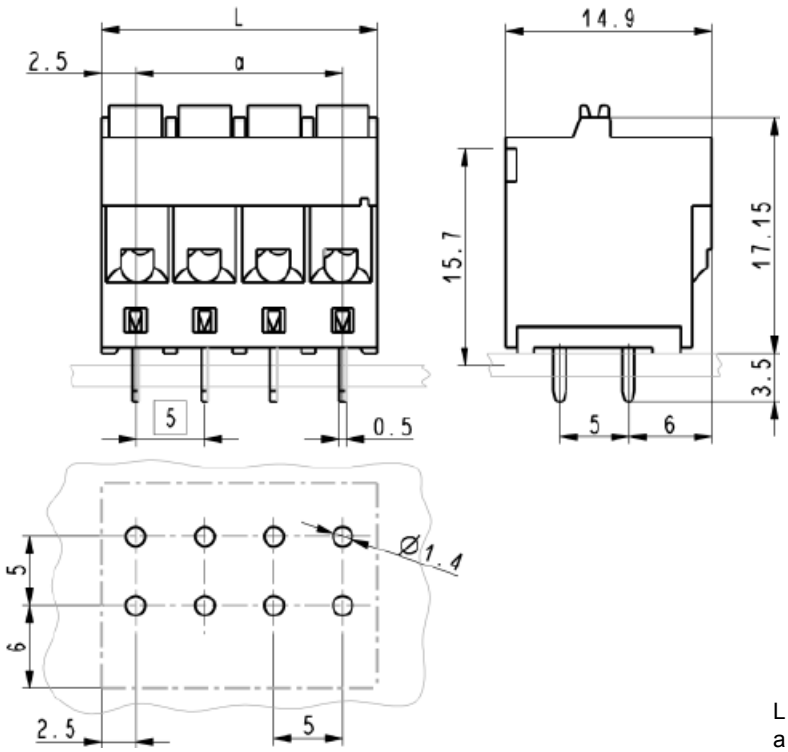
Downloaded from Arrow.com.

PCB terminal blocks,
vertical with push-in-spring-cage termination
for reflow soldering
pitch 5.00 mm

Drawing

Dimensions in mm

Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 12 A |
| Pitch | 5.00 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 300 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor and solder pin data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor size | |
| solid / stranded | 0.2 - 2.5 / 0.2 - 2.5 mm² |
| stranded with ferrules without / with plastic sleeve | 0.5 - 2.5 / 0.5 - 2.5 mm² |
| Conductor size AWG | 30 - 12 |
| Stripping length | 10 mm |
| Solder pin: drilled hole diameter | 1.4 mm |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 12 A | – | 12 A |





Downloaded from Arrow.com.

PCB terminal blocks,
horizontal with screw termination
for reflow soldering
pitch 5.00 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB terminal blocks, horizontal with screw termination | | | |
| for wire gauge 2.5 mm² | 2 | 14 02 021 6404 . . . | 100 |
| | 3 | 14 02 031 6404 . . . | 100 |
| | 4 | 14 02 041 6404 . . . | 75 |
| | 5 | 14 02 051 6404 . . . | 75 |
| | 6 | 14 02 061 6404 . . . | 50 |
| | 7 | 14 02 071 6404 . . . | 50 |
| | 8 | 14 02 081 6404 . . . | 50 |

for samples (1 piece)
for a packaging unit 333 000



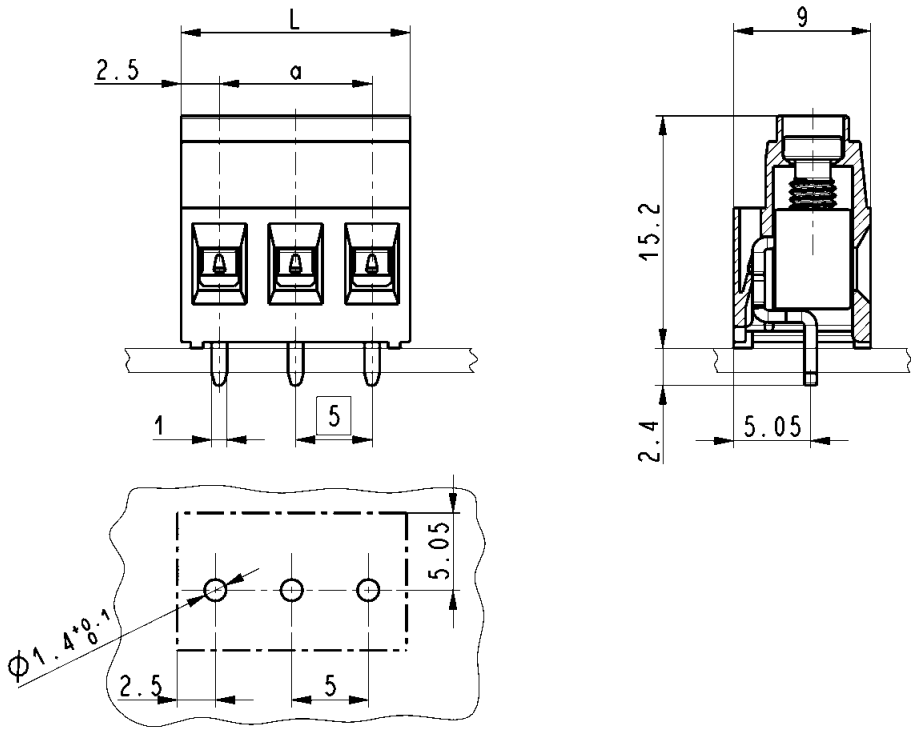
Downloaded from Arrow.com.

PCB terminal blocks,
horizontal with screw termination
for reflow soldering
pitch 5.00 mm

Drawing

Dimensions in mm

Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 17.5 A |
| Pitch | 5.00 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 300 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Conductor and solder pin data

| | |
|---|---|
| Connection technology wire | screw termination |
| Conductor size | |
| solid / stranded | 0.05 - 2.5 / 0.05 - 2.5 mm² |
| stranded with ferrules without / with plastic sleeve | 0.50 - 2.5 / 0.10 - 2.5 mm² |
| Conductor size AWG | 30 - 12 |
| Screw thread | M3 |
| Tightening torque | 0.5 - 0.6 Nm |
| Stripping length | 5.5 - 6.5 mm |
| Solder pin: drilled hole diameter | 1.4 mm |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 17.5 A | – | 17.5 A |





Downloaded from Arrow.com.

# PCB terminal blocks, horizontal with screw termination for reflow soldering pitch 5.00 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| **PCB terminal blocks, horizontal with screw termination** | | | |
| for wire gauge 1.5 mm² | 2 | 14 02 021 6402 . . . | 100 |
| | 3 | 14 02 031 6402 . . . | 100 |
| | 4 | 14 02 041 6402 . . . | 75 |
| | 5 | 14 02 051 6402 . . . | 75 |
| | 6 | 14 02 061 6402 . . . | 50 |
| | 7 | 14 02 071 6402 . . . | 50 |
| | 8 | 14 02 081 6402 . . . | 50 |
| | 9 | 14 02 091 6402 . . . | 50 |
| | 10 | 14 02 101 6402 . . . | 50 |
| | 11 | 14 02 111 6402 . . . | 50 |
| | 12 | 14 02 121 6402 . . . | 50 |

for samples (1 piece) 333
for a packaging unit 000



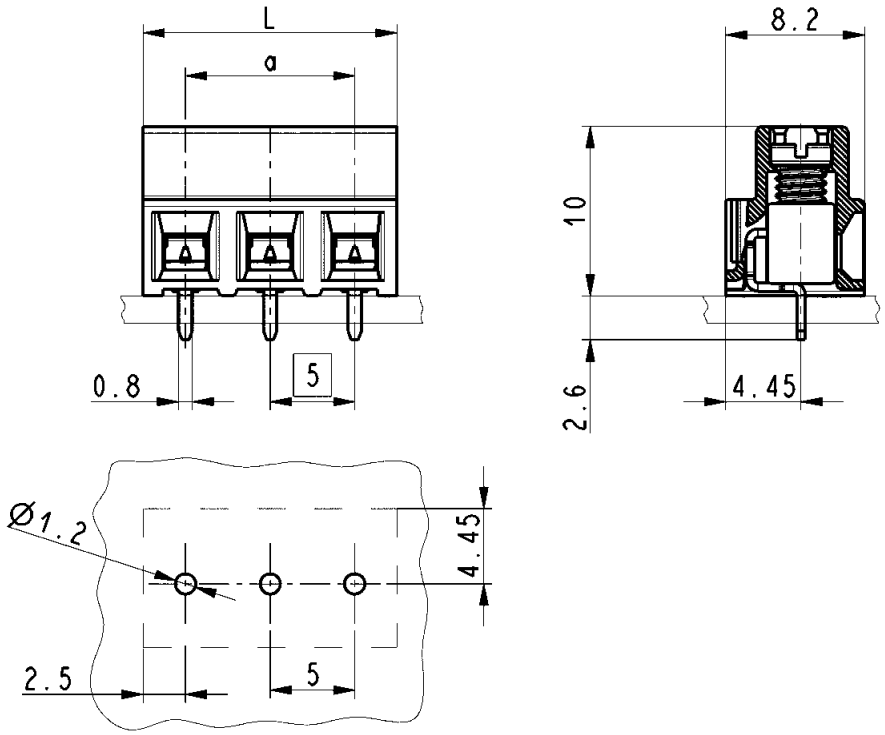
Downloaded from Arrow.com.

PCB terminal blocks,
horizontal with screw termination
for reflow soldering
pitch 5.00 mm

Drawing

Dimensions in mm

Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 13.5 A |
| Pitch | 5.00 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 220 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Conductor and solder pin data

| | |
|---|---|
| Connection technology wire | screw termination |
| Conductor size<br>solid / stranded<br>stranded with ferrules<br>without / with plastic sleeve | <br>0.05 - 1.5 / 0.05 - 1.0 mm²<br><br>0.50 - 1.5 / 0.10 - 1.5 mm² |
| Conductor size AWG | 30 - 16 |
| Screw thread | M3 |
| Tightening torque | 0.5 - 0.6 Nm |
| Stripping length | 5.0 - 6.0 mm |
| Solder pin: drilled hole diameter | 1.2 mm |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 13.5 A | – | 13.5 A |





Downloaded from Arrow.com.

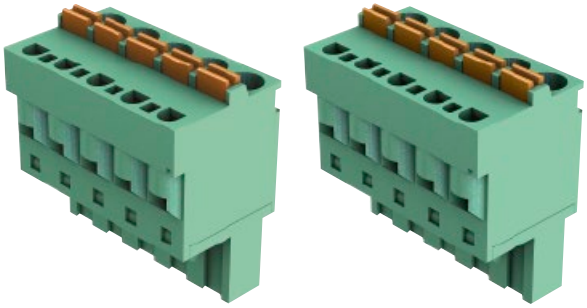
# PCB connectors female, horizontal with push-in-spring-cage termination pitch 5.00 / 5.08 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors female, horizontal with push-in-spring-cage termination | 2 | 14 31 021 . 102 000 | 300 |
| | 3 | 14 31 031 . 102 000 | 200 |
| | 4 | 14 31 041 . 102 000 | 150 |
| | 5 | 14 31 051 . 102 000 | 150 |
| | 6 | 14 31 061 . 102 000 | 100 |
| | 7 | 14 31 071 . 102 000 | 100 |
| | 8 | 14 31 081 . 102 000 | 100 |
| | 9 | 14 31 091 . 102 000 | 100 |
| | 10 | 14 31 101 . 102 000 | 100 |
| | 11 | 14 31 111 . 102 000 | 100 |
| | 12 | 14 31 121 . 102 000 | 100 |
| | 13 | 14 31 131 . 102 000 | 50 |
| | 14 | 14 31 141 . 102 000 | 50 |
| | 15 | 14 31 151 . 102 000 | 50 |
| | 16 | 14 31 161 . 102 000 | 50 |
| | 17 | 14 31 171 . 102 000 | 50 |
| | 18 | 14 31 181 . 102 000 | 50 |
| Please insert digit for<br>pitch 5.00 mm ▶ 6<br>pitch 5.08 mm ▶ 7 | | | |
| Coding keys | | 14 95 000 0052 000 | 120 |



Downloaded from Arrow.com.

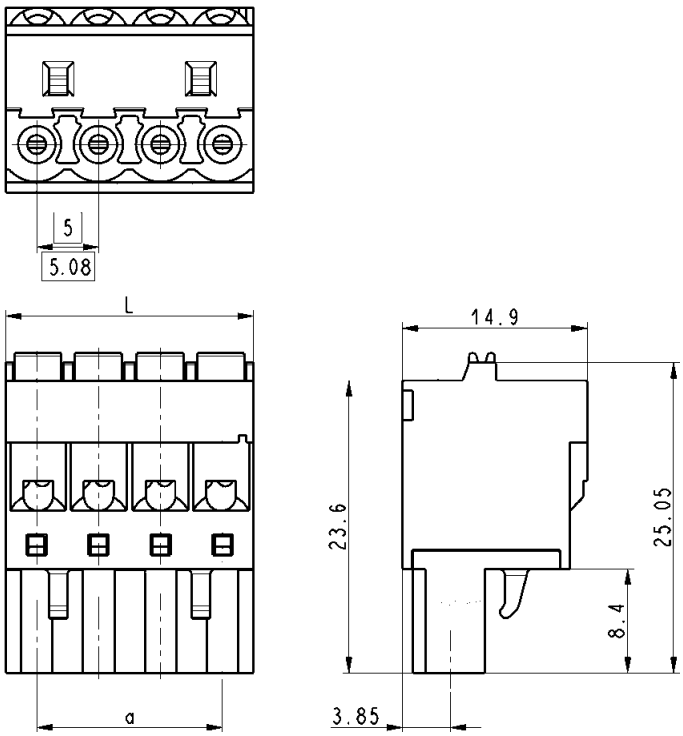
PCB connectors female,
horizontal
with push-in-spring-cage termination
pitch 5.00 / 5.08 mm



Drawing

Dimensions in mm

Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 12 A |
| Pitch | 5.00 mm / 5.08 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 250 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor size<br>solid / stranded<br>stranded with ferrules<br>without / with plastic sleeve | <br>0.2 - 2.5 / 0.2 - 2.5 mm²<br><br>0.5 - 2.5 / 0.5 - 2.5 mm² |
| Conductor size AWG | 30 - 12 |
| Stripping length | 10 mm |

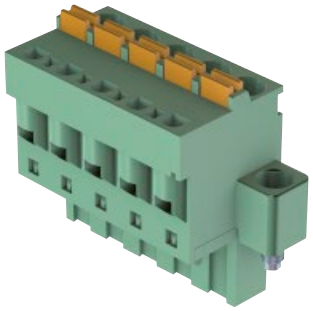
## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 12 A | – | 12 A |



Downloaded from Arrow.com.

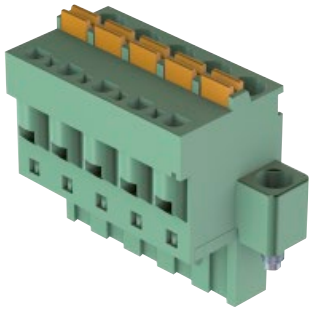
PCB connectors female
with screw flange,
horizontal
with push-in-spring-cage termination
pitch 5.08 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors female with screw flange, horizontal with push-in-spring-cage termination | 2 | 14 31 021 7106 000 | 300 |
| | 3 | 14 31 031 7106 000 | 200 |
| | 4 | 14 31 041 7106 000 | 150 |
| | 5 | 14 31 051 7106 000 | 150 |
| | 6 | 14 31 061 7106 000 | 100 |
| | 7 | 14 31 071 7106 000 | 100 |
| | 8 | 14 31 081 7106 000 | 100 |
| | 9 | 14 31 091 7106 000 | 100 |
| | 10 | 14 31 101 7106 000 | 100 |
| | 11 | 14 31 111 7106 000 | 100 |
| | 12 | 14 31 121 7106 000 | 100 |
| | 13 | 14 31 131 7106 000 | 50 |
| | 14 | 14 31 141 7106 000 | 50 |
| | 15 | 14 31 151 7106 000 | 50 |
| | 16 | 14 31 161 7106 000 | 50 |
| | 17 | 14 31 171 7106 000 | 50 |
| | 18 | 14 31 181 7106 000 | 50 |
| Coding keys | | 14 95 000 0052 000 | 120 |



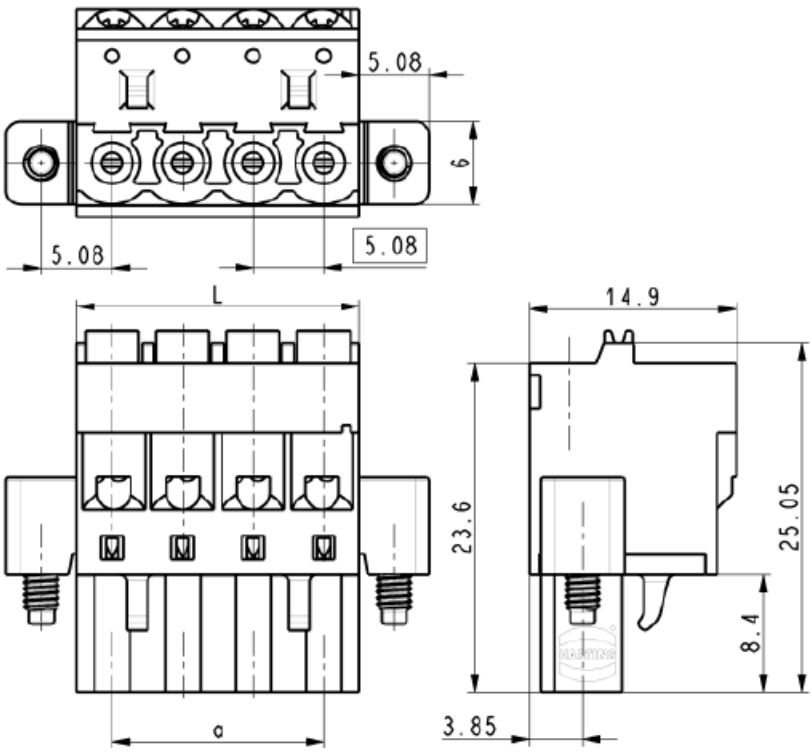
Downloaded from Arrow.com.



PCB connectors female
with screw flange,
horizontal
with push-in-spring-cage termination
pitch 5.08 mm

Drawing — Dimensions in mm

Dimensions




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 12 A |
| Pitch | 5.08 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 250 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |
| Screw flange | M2.5 |

## Conductor data

| | |
|---|---|
| Connection technology wire | push-in-spring-cage termination |
| Conductor size<br>solid / stranded<br>stranded with ferrules<br>without / with plastic sleeve | <br>0.2 - 2.5 / 0.2 - 2.5 mm²<br><br>0.5 - 2.5 / 0.5 - 2.5 mm² |
| Conductor size AWG | 30 - 12 |
| Stripping length | 10 mm |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 12 A | – | 12 A |





Downloaded from Arrow.com.

# PCB connectors female, vertical / horizontal with screw termination pitch 5.00 / 5.08 mm

| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors female, vertical / horizontal with screw termination | 2 | 14 31 021 . 40 . 000 | 300 |
| | 3 | 14 31 031 . 40 . 000 | 200 |
| | 4 | 14 31 041 . 40 . 000 | 150 |
| | 5 | 14 31 051 . 40 . 000 | 150 |
| | 6 | 14 31 061 . 40 . 000 | 100 |
| | 7 | 14 31 071 . 40 . 000 | 100 |
| | 8 | 14 31 081 . 40 . 000 | 100 |
| | 9 | 14 31 091 . 40 . 000 | 100 |
| | 10 | 14 31 101 . 40 . 000 | 100 |
| | 11 | 14 31 111 . 40 . 000 | 100 |
| | 12 | 14 31 121 . 40 . 000 | 100 |
| | 13 | 14 31 131 . 40 . 000 | 50 |
| | 14 | 14 31 141 . 40 . 000 | 50 |
| | 15 | 14 31 151 . 40 . 000 | 50 |
| | 16 | 14 31 161 . 40 . 000 | 50 |
| | 17 | 14 31 171 . 40 . 000 | 50 |
| | 18 | 14 31 181 . 40 . 000 | 50 |
| | 19 | 14 31 191 . 40 . 000 | 50 |
| | 20 | 14 31 201 . 40 . 000 | 50 |
| | 21 | 14 31 211 . 40 . 000 | 25 |
| | 22 | 14 31 221 . 40 . 000 | 25 |
| | 23 | 14 31 231 . 40 . 000 | 25 |
| | 24 | 14 31 241 . 40 . 000 | 25 |
| | 25 | 14 31 251 . 40 . 000 | 25 |

Please insert digit for

pitch 5.00 mm ▶ 6
pitch 5.08 mm ▶ 7

vertical* ▶ 1
horizontal ▶ 2

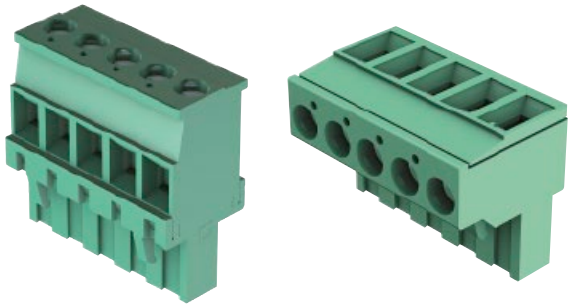
| | | |
|---|---|---|
| Coding keys | 14 95 000 0052 000 | 120 |

* Only available in 5.08 mm pitch



Downloaded from Arrow.com.

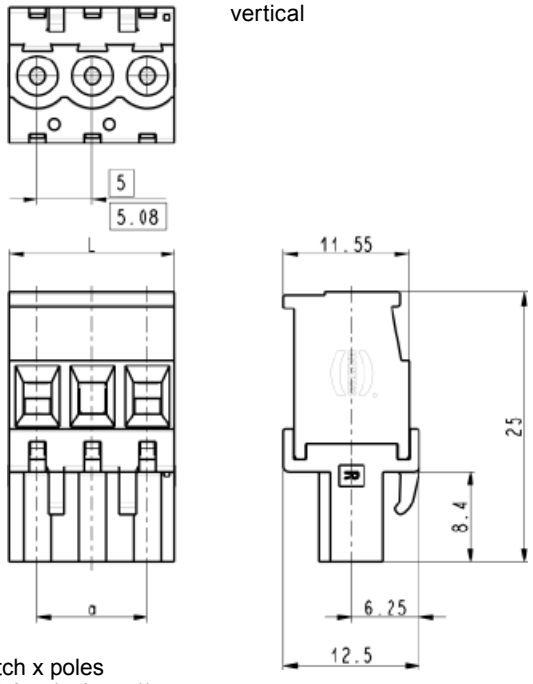
PCB connectors female,
vertical / horizontal
with screw termination
pitch 5.00 / 5.08 mm



Drawing — Dimensions in mm

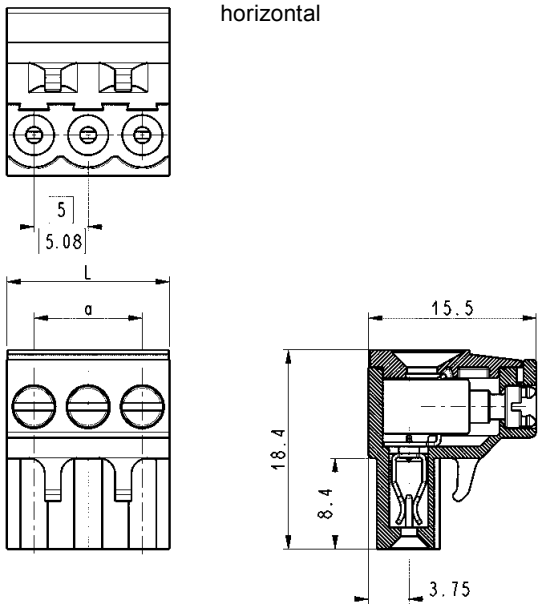
## Dimensions

vertical




L = pitch x poles
a = pitch x (poles - 1)

horizontal




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 15 A |
| Pitch | 5.00 mm / 5.08 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 250 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor data

| | |
|---|---|
| Connection technology wire | screw termination |
| Conductor size | |
| solid / stranded | 0.05 - 2.5 / 0.05 - 2.5 mm² |
| stranded with ferrules without / with plastic sleeve | 0.50 - 2.5 / 0.10 - 2.5 mm² |
| Conductor size AWG | 30 - 12 |
| Screw thread | M3 |
| Tightening torque | 0.5 - 0.6 Nm |
| Stripping length | 6.0 - 7.5 mm |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 15 A | – | 15 A |





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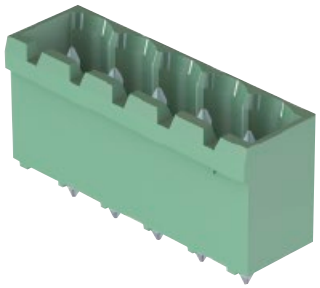
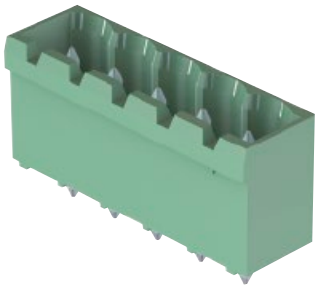
# PCB connectors male, vertical for wave soldering pitch 5.00 / 5.08 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors male, vertical | | | |
| | 2 | 14 13 021 . 001 000 | 100 |
| | 3 | 14 13 031 . 001 000 | 100 |
| | 4 | 14 13 041 . 001 000 | 75 |
| | 5 | 14 13 051 . 001 000 | 75 |
| | 6 | 14 13 061 . 001 000 | 50 |
| | 7 | 14 13 071 . 001 000 | 50 |
| | 8 | 14 13 081 . 001 000 | 50 |
| | 9 | 14 13 091 . 001 000 | 50 |
| | 10 | 14 13 101 . 001 000 | 50 |
| | 11 | 14 13 111 . 001 000 | 50 |
| | 12 | 14 13 121 . 001 000 | 50 |
| Please insert digit for<br>pitch 5.00 mm ▶ 6<br>pitch 5.08 mm ▶ 7 | | | |
| Coding keys | | 14 95 000 0051 000 | 120 |



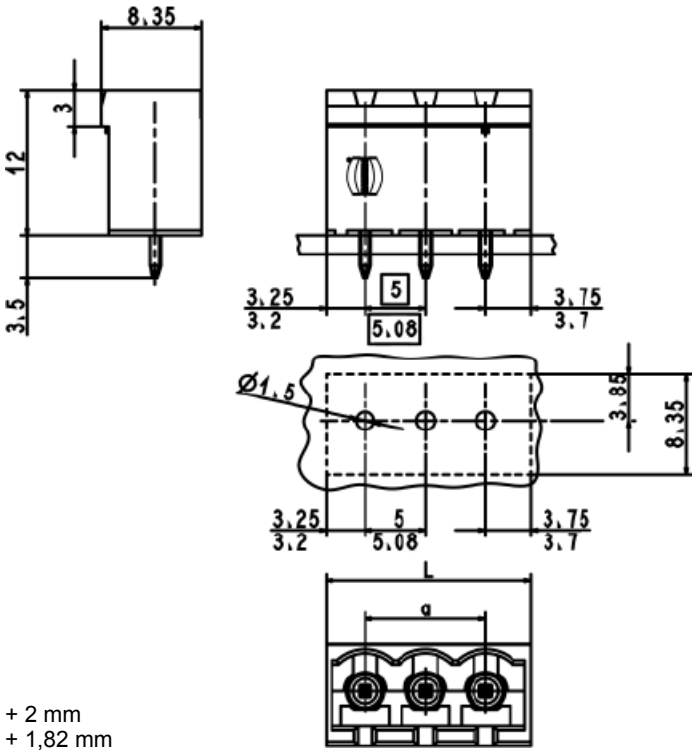
Downloaded from Arrow.com.



PCB connectors male,
vertical
for wave soldering
pitch 5.00 / 5.08 mm

Drawing — Dimensions in mm

## Dimensions




Pitch 5.00 mm: L = (pitch x poles) + 2 mm
Pitch 5.08 mm: L = (pitch x poles) + 1,82 mm

# Technical characteristics

### Technical data

| | |
|---|---|
| Rated current | 15 A |
| Pitch | 5.00 mm / 5.08 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 250 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

### Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

### Solder pin data

| | |
|---|---|
| Solder pin: drilled hole diameter | 1.5 mm |

### Approval data (UL)

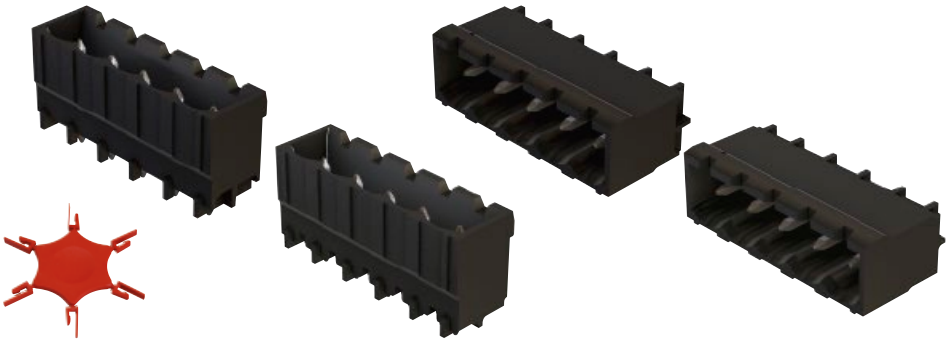
| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 15 A | – | 15 A |





Downloaded from Arrow.com.

PCB connectors male,
vertical/horizontal
for reflow soldering
pitch 5.00 / 5.08 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors male, vertical/horizontal | | | |
| | 2 | 14 12 021 . 00 . . . . | 100 |
| | 3 | 14 12 031 . 00 . . . . | 100 |
| | 4 | 14 12 041 . 00 . . . . | 75 |
| | 5 | 14 12 051 . 00 . . . . | 75 |
| | 6 | 14 12 061 . 00 . . . . | 50 |
| | 7 | 14 12 071 . 00 . . . . | 50 |
| | 8 | 14 12 081 . 00 . . . . | 50 |
| | 9 | 14 12 091 . 00 . . . . | 50 |
| | 10 | 14 12 101 . 00 . . . . | 50 |
| | 11 | 14 12 111 . 00 . . . . | 50 |
| | 12 | 14 12 121 . 00 . . . . | 50 |
| | 13 | 14 12 131 . 00 . . . . | 50 |
| | 14 | 14 12 141 . 00 . . . . | 50 |
| | 15 | 14 12 151 . 00 . . . . | 50 |
| | 16 | 14 12 161 . 00 . . . . | 50 |
| | 17 | 14 12 171 . 00 . . . . | 50 |
| | 18 | 14 12 181 . 00 . . . . | 50 |
| | 19 | 14 12 191 . 00 . . . . | 50 |
| | 20* | 14 12 201 . 00 . . . . | 50 |

Please insert digit for

pitch 5.00 mm ▶ 6
pitch 5.08 mm ▶ 7

vertical ▶ 1
horizontal ▶ 2

| | | | |
|---|---|---|---|
| Coding keys | | 14 95 000 0051 000 | 120 |

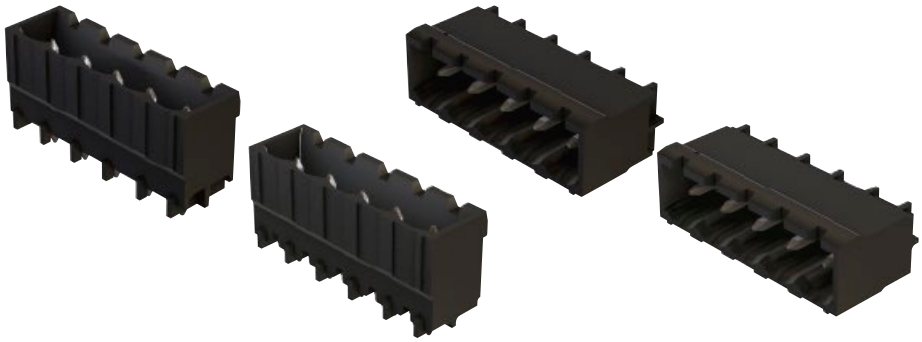
* Not available in pitch 5.00 mm (horizontal)

for samples (1 piece)
for a packaging unit 333 000



Downloaded from Arrow.com.

PCB connectors male,
vertical/horizontal
for reflow soldering
pitch 5.00 / 5.08 mm

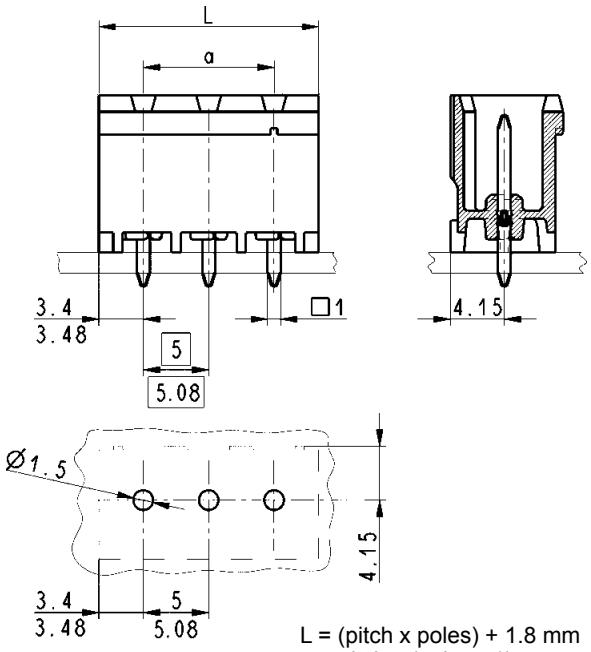


Drawing

Dimensions in mm

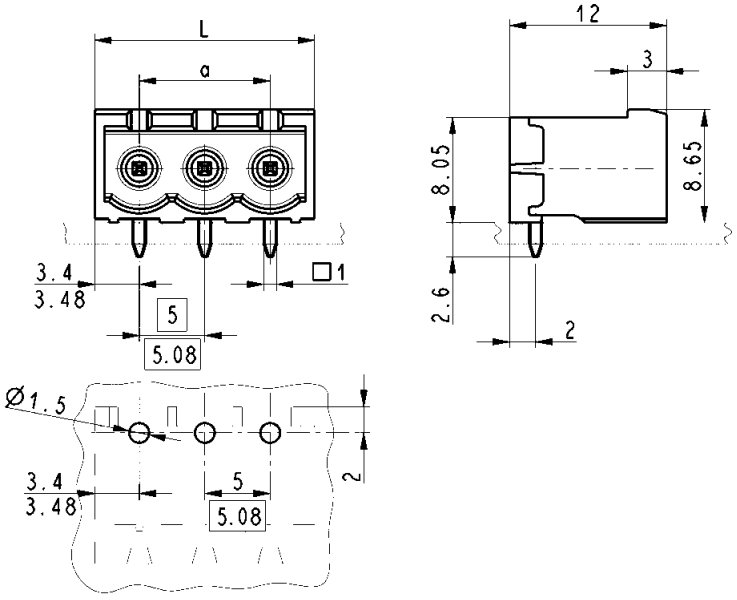
## Dimensions

vertical




L = (pitch x poles) + 1.8 mm
a = pitch x (poles - 1)

horizontal




L = (pitch x poles) + 1.8 mm
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 15 A |
| Pitch | 5.00 mm / 5.08 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 250 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Solder pin data

| | |
|---|---|
| Solder pin: drilled hole diameter | 1.5 mm |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 15 A | – | 15 A |





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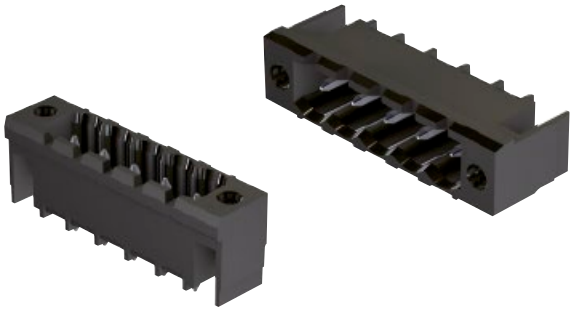
# PCB connectors male with thread flange, vertical/horizontal for reflow soldering pitch 5.08 mm



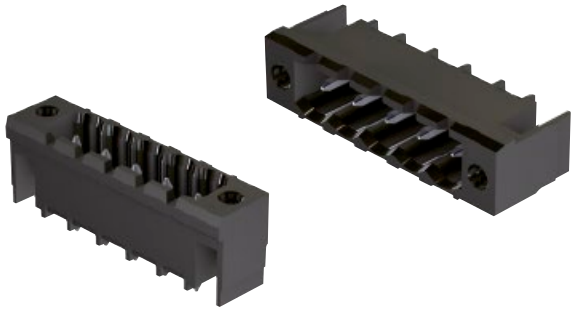
| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| PCB connectors male with thread flange, vertical/horizontal | 2 | 14 12 021 700 . . . | 100 |
| | 3 | 14 12 031 700 . . . | 100 |
| | 4 | 14 12 041 700 . . . | 75 |
| | 5 | 14 12 051 700 . . . | 75 |
| | 6 | 14 12 061 700 . . . | 50 |
| | 7 | 14 12 071 700 . . . | 50 |
| | 8 | 14 12 081 700 . . . | 50 |
| | 9 | 14 12 091 700 . . . | 50 |
| | 10 | 14 12 101 700 . . . | 50 |
| | 11 | 14 12 111 700 . . . | 50 |
| | 12 | 14 12 121 700 . . . | 50 |
| | 13 | 14 12 131 700 . . . | 50 |
| | 14 | 14 12 141 700 . . . | 50 |
| | 15 | 14 12 151 700 . . . | 50 |
| | 16 | 14 12 161 700 . . . | 50 |
| | 17 | 14 12 171 700 . . . | 50 |
| | 18 | 14 12 181 700 . . . | 50 |
| Please insert digit for<br>vertical ▶ 5<br>horizontal ▶ 6 | | | |
| Coding keys | | 14 95 000 0051 000 | 120 |

for samples (1 piece) / for a packaging unit 333 000



Downloaded from Arrow.com.

PCB connectors male
with thread flange,
vertical/horizontal
for reflow soldering
pitch 5.08 mm

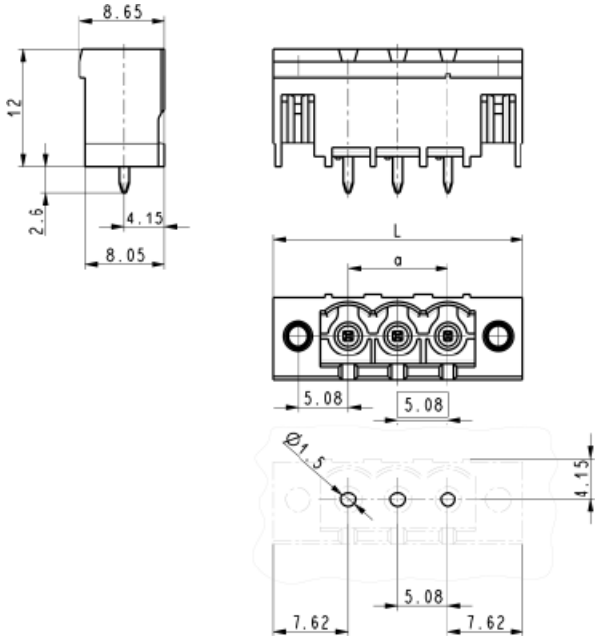


Drawing

Dimensions in mm

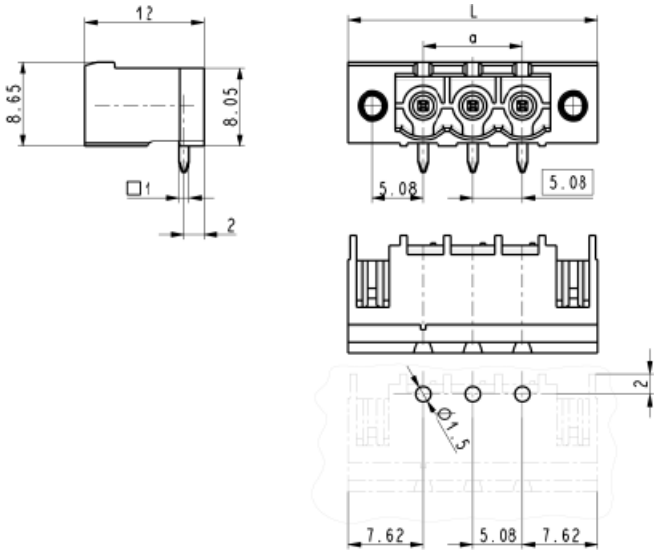
## Dimensions

vertical




L = pitch x (poles + 2)
a = pitch x (poles - 1)

horizontal




L = pitch x (poles + 2)
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 15 A |
| Pitch | 5.08 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 250 V | 300 V | 600 V |
| Rated surge voltage | 4 kV | 4 kV | 4 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |
| Thread flange | M2.5 |

## Solder pin data

| | |
|---|---|
| Solder pin: drilled hole diameter | 1.4 mm |

## Approval data (UL)

| Use group | B | C | D |
|---|---|---|---|
| Rated voltage | 300 V | – | 300 V |
| Rated current | 15 A | – | 15 A |





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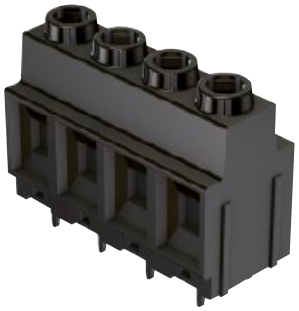
PCB terminal blocks,
horizontal with screw termination
10 mm² / 25 mm²
for reflow soldering
pitch 10.16 / 15.00 mm



| Identification | No. of contacts | Part number | Packaging unit (pieces) |
|---|---|---|---|
| **PCB terminal blocks, stackable horizontal with screw termination** | | | |
| For wire gauge 10 mm²<br>Pitch 10.16 mm<br>600 V 60 A | 2 | 14 02 022 5402 000 | 50 |
| | 3 | 14 02 032 5402 000 | 50 |
| | 4 | 14 02 042 5402 000 | 40 |
| For wire gauge 25 mm²<br>Pitch 15.00 mm<br>600 V 135 A | 2 | 14 02 022 7402 000 | 50 |
| | 3 | 14 02 032 7402 000 | 40 |
| | 4 | 14 02 042 7402 000 | 30 |

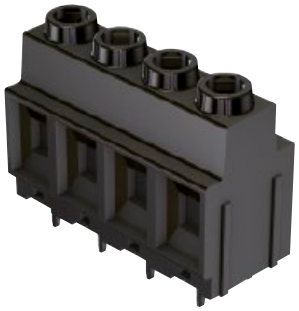
Approval data (UL)

| Use group | | B | C | D |
|---|---|---|---|---|
| Rated voltage | Pitch 10.16 mm | 300 V | 300 V | 600 V |
| | Pitch 15.00 mm | 600 V | 600 V | – |
| Rated current | Pitch 10.16 mm | 60 A | 60 A | 60 A |
| | Pitch 15.00 mm | 135 A | 135 A | – |



Downloaded from Arrow.com.

PCB terminal blocks,
horizontal with screw termination
10 mm² / 25 mm²
for reflow soldering
pitch 10.16 / 15.00 mm

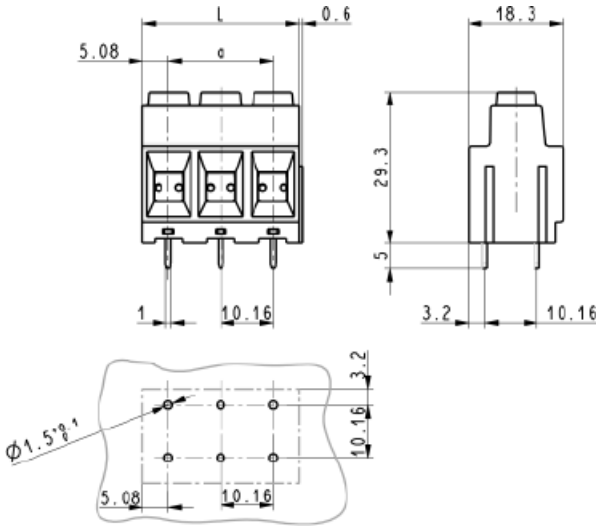


Drawing

Dimensions in mm

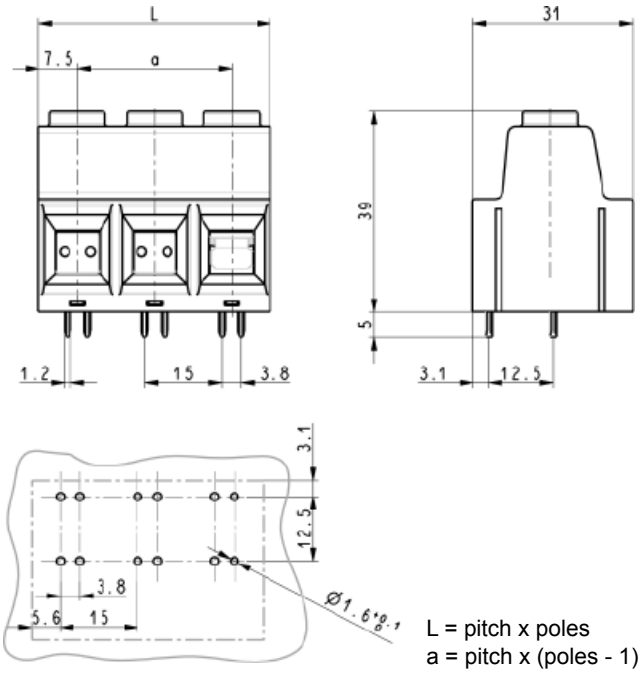
## Dimensions

Pitch 10.16 mm




L = pitch x poles
a = pitch x (poles - 1)

Pitch 15.00 mm




L = pitch x poles
a = pitch x (poles - 1)

# Technical characteristics

## Technical data

| | |
|---|---|
| Rated current | 60 / 135 A |
| Pitch | 10.16 / 15.00 mm |

| Surge voltage category / pollution degree | III/3 | III/2 | II/2 |
|---|---|---|---|
| Rated voltage | 1 kV | 1 kV | 1 kV |
| Rated surge voltage | 8 kV | 8 kV | 8 kV |

## Material data

| | |
|---|---|
| Group of insulation material | I |
| Type of insulation material | PA / PPA |
| Flammability rating per UL 94 | V0 |
| Operating temperature | -40 °C … +110 °C |
| Contact material | copper alloy |
| Contact plating | tin plated |
| | UL approval (E 102079) |

## Conductor and solder pin data

| | Pitch 10.16 mm | Pitch 15.00 mm |
|---|---|---|
| Connection technology wire | screw termination | screw termination |
| Conductor size | | |
| solid / stranded | 0.5 - 16 / 0.5 - 10 mm² | 0.5 - 35 / 0.5 - 25 mm² |
| stranded with ferrules without / with plastic sleeve | 0.5 - 6 / 0.5 - 6 mm² | 0.5 - 16 / 0.5 - 16 mm² |
| Conductor size AWG | 20 - 6 | 20 - 1 |
| Screw thread | M4 | M5 |
| Tightening torque | 1.2 - 1.5 Nm | 2.1 - 2.5 Nm |
| Stripping length | 11 mm | 18 mm |
| Solder pin: drilled hole diameter | min. 1.5 mm | min. 1.6 mm |





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# 20. Tools

Basic element for a reliable connection is besides the quality of the connector the right choice of the assembly tool.
HARTING offers the corresponding tools to all connectors. On the following catalogue pages you find information about tools for crimp, press-in and IDC termination. There are tools available for different levels of automation. The choice varies from pure hand tools for small series or service up to fully automatic assembly tools for high volume series production.

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## Contents


| | Page |
|---|---|
| Tools for crimp contacts | **20.02** |
| Crimp tools for screened hoods | **20.25** |
| Tools for press-in contacts | **20.26** |
| Tools for insulation displacement contacts | **20.41** |
| Tools for FOC contacts | **20.43** |




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# Tools for crimp contacts

## Tools for contacts **Han D®** (09 15 ...)

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING Service crimping tool<br>with locator<br>set for Han D®, Han E® | **09 99 000 0021** | Wire gauge Han D®<br>0.14 ... 1.5 mm² | |
| BUCHANAN crimping tool | **09 99 000 0888** | Wire gauge<br>0.14 ... 2.5 mm² | |
| HARTING crimping tool<br>with locator<br>for Han D®, Han E®, Han® C | **09 99 000 0110** | Wire gauge Han D®<br>0.14 ... 1.5 mm² | |
| HARTING Pneumatic crimping tool CP 600 | 09 99 000 0810 | | |
| Crimp die Han D®, Han E®, Han® C | 09 99 000 0813 | Wire gauge Han D®<br>0.14 ... 1.5 mm² | |
| Footswitch | 09 99 000 0811 | | |
| Table fixing | 09 99 000 0812 | | |

[1] For wire gauge 0.14 and 0.25 mm² use only male contact 09 15 000 6107 or female contact 09 15 000 6207.

**Stock items in bold type**



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# Tools for crimp contacts

## Tools for contacts **Han D®** (09 15 ...)

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Insertion tool for crimp contacts | **09 99 000 0059** | For crimp contacts with wires of less than 0.75 mm² it is recommended that an insertion tool is used. Contacts should be inserted from the wiring side and pushed down until a positive locking is achieved. | |
| Removal tool for crimp contacts | | | |
| Removal tool | **09 99 000 0012** | | |
| Replacement-tip for removal tool | **09 99 000 0004** |  | |
| Removal tool | **09 99 000 0052** | A removal tool is necessary if contacts are to be replaced in the insert. It is inserted from the mating face and pushed over the contact until a stop is noticeable. Additional pressure unlocks the contact and pushes it out of the wiring side. In case of the removal tool (. . 0052) the unlocking process is achieved by pressure on the central rod. | |





**Stock items in bold type**

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# Tools for crimp contacts

## Tools for contacts **Han E®** (09 33 ...)

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| HARTING Service crimping tool<br>with locator<br>set for Han D®, Han E® | **09 99 000 0021** | Wire gauge Han E®<br>0.5 ... 2.5 mm² | |
| BUCHANAN crimping tool | **09 99 000 0888** | Wire gauge<br>0.14 ... 4 mm² | |
| HARTING crimping tool<br>with locator<br>for Han D®, Han E®, Han® C | **09 99 000 0110** | Wire gauge Han E®<br>0.5 ... 4 mm² | |
| HARTING Pneumatic crimping tool CP 600 | 09 99 000 0810 | | |
| Crimp die Han D®, Han E®, Han® C | 09 99 000 0813 | Wire gauge Han E®<br>0.5 ... 4 mm² | |
| Footswitch | 09 99 000 0811 | | |
| Table fixing | 09 99 000 0812 | | |

**Stock items in bold type**



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# Tools for crimp contacts

## Tools for contacts **Han E®** (09 33 ...)

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Insertion tool for crimp contacts | **09 99 000 0059** | For crimp contacts with wires of less than 0.75 mm² it is recommended that an insertion tool is used. Contacts should be inserted from the wiring side and pushed down until a positive locking is achieved. | |
| Insertion tool for Han® ES inserts | 09 99 000 0367 | | |
| Removal tool for crimp contacts<br>for Han® EE, Han® Q 5/0, Han® Q 8/0, Han E®, Han-*Yellock*® and Han A® | **09 99 000 0319** | A removal tool is necessary if contacts are to be replaced in the insert. The tool is inserted from the wiring side until a stop is noticeable. The wire with the crimp contact can then be pulled out from the same side of the insert. | |





**Stock items in bold type**

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# Tools for crimp contacts

## Tools for contacts **Han® C** (09 32 ...)

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| BUCHANAN crimping tool | **09 99 000 0888** | Wire gauge<br>0.14 ... 4 mm² | |
| HARTING crimping tool<br>with locator<br>for Han D®, Han E®, Han® C | **09 99 000 0110** | Wire gauge Han® C<br>1.5 ... 4 mm² | |
| HARTING crimping tool<br>with locator<br>for Han® C | 09 99 000 0303 | Wire gauge<br>4 ... 6 mm² | |
| Locator as spare part | 09 99 000 0304 | | |
| HARTING crimping tool<br>for Han® C | 09 99 000 0377 | Wire gauge<br>6 ... 10 mm² | |
| HARTING Pneumatic crimping tool CP 600 | | | |
| Crimp die Han® C | 09 99 000 0810 | | |
| | 09 99 000 0813 | Wire gauge Han® C<br>1.5 ... 4 mm² | |
| Crimp die Han® C | 09 99 000 0814 | Wire gauge Han® C<br>6 ... 10 mm² | |
| Footswitch | 09 99 000 0811 | | |
| Table fixing | 09 99 000 0812 | | |

**Stock items in bold type**





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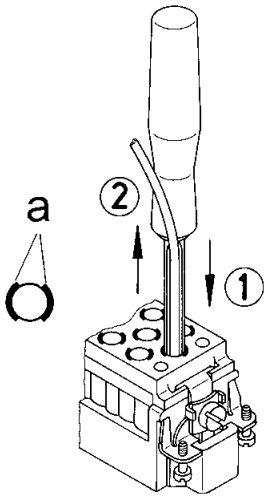
## Tools for contacts **Han® C** (09 32 ...)

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Removal tool for crimp contacts** | | | |
| Removal tool | | | |
| 1.5 ... 6 mm² | **09 99 000 0305** | | |
| 10 mm² | **09 99 000 0381** | | |

A removal tool is necessary to remove the contacts. For each „C“ contact cavity, the location of the internal locking levers are marked on the wiring side with two black arcs. The sides of the tool must be first properly aligned so that the edges of the tool engage both levers simultaneously and then inserted until a stop is noticeable ①. Once it has been inserted, the tool must not be turned. The wire together with the tool can then be pulled out from the wiring side of the insert ②.




a ... lever marking





**Stock items in bold type**

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## Overview Han® crimping tools

| Crimp contacts Series | Part number | | | | mm² | AWG | Crimping tools | | | | | | Tools | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | male contact silver plated | female contact silver plated | male contact silver plated | female contact gold plated | | | 09 99 000 0888 | 09 99 000 0110 | 09 99 000 0021 | 09 99 000 0303 | 09 99 000 0377 | 20 99 000 1035 | removal tools | |
| Han D® Signal contacts 09 15 000 .... | 6107 | 6207 | 6127 | 6227 | 0.14 - 0.25 | 26 - 24 | x | | | | | | 09 99 000 0012 | 09 99 000 0052 |
| | 6104 | 6204 | 6124 | 6224 | | | | x | x | | | | | |
| | 6107 | 6207 | 6127 | 6227 | 0.37 | 22 | x | | | | | | | |
| | 6104 | 6204 | 6124 | 6224 | | | x | x | x | | | | | |
| | 6103 | 6203 | 6123 | 6223 | 0.5 | 20 | x | x | x | | | | | |
| | 6105 | 6205 | 6125 | 6225 | 0.75 | 18 | x | x | x | | | | | |
| | 6102 | 6202 | 6122 | 6222 | 1.0 | 18 | x | x | x | | | | | |
| | 6101 | 6201 | 6121 | 6221 | 1.5 | 16 | x | x | x | | | | | |
| | 6106 | 6206 | 6126 | 6226 | 2.5 | 14 | x | | | | | | | |
| Han D® F.O. contacts 20 10 001 .... | Male contact 3211 3212 / 3213 | | Female contact 3221 3222 | | 1 mm POF | | | | | | | x | | |
| Han E® Power contacts 09 33 000 .... | 6127 | 6227 | 6117 | 6217 | 0.14 - 0.37 | 26 - 22 | x | | | | | | 09 99 000 0319 | |
| | 6121 | 6220 | 6122 | 6222 | 0.5 | 20 | x | x | x | | | | | |
| | 6114 | 6214 | 6115 | 6215 | 0.75 | 18 | x | x | x | | | | | |
| | 6105 | 6205 | 6118 | 6218 | 1.0 | 18 | x | x | x | | | | | |
| | 6104 | 6204 | 6116 | 6216 | 1.5 | 16 | x | x | x | | | | | |
| | 6102 | 6202 | 6123 | 6223 | 2.5 | 14 | x | x | x | | | | | |
| | 6106 | 6206 | | | 3.0 | 12 | x | x | | | | | | |
| | 6107 | 6207 | 6119 | 6221 | 4.0 | 12 | x | x | | | | | | |
| Han E® F.O. contacts 20 10 001 .... | Male contact 3311 | | Female contact 3321 | | 1 mm POF | | | | | | | x | | |
| Han-*Yellock*® Power contacts 11 05 000 .... | 6101 | 6201 | 6121 | 6221 | 0.14 - 0.37 | 26 - 22 | x | | | | | | 09 99 000 0319 | |
| | 6102 | 6202 | 6122 | 6222 | 0.5 | 20 | x | x | x | | | | | |
| | 6103 | 6203 | 6123 | 6223 | 0.75 | 18 | x | x | x | | | | | |
| | 6104 | 6204 | 6124 | 6224 | 1.0 | 18 | x | x | x | | | | | |
| | 6105 | 6205 | 6125 | 6225 | 1.5 | 16 | x | x | x | | | | | |
| | 6106 | 6206 | 6126 | 6226 | 2.5 | 14 | x | x | x | | | | | |
| | 6107 | 6207 | 6127 | 6227 | 3.0 | 12 | x | x | | | | | | |
| | 6108 | 6208 | 6128 | 6228 | 4.0 | 12 | x | x | | | | | | |
| Han® C Power contacts 09 32 000 .... | 6104 | 6204 | | | 1.5 | 16 | x | x | | | | | 09 99 000 0305 | 09 99 000 0381[1] |
| | 6105 | 6205 | | | 2.5 | 14 | x | x | | | | | | |
| | 6107 | 6207 | | | 4.0 | 12 | x | x | | x | | | | |
| | 6108 | 6208 | | | 6.0 | 10 | | | | x | x | | | |
| | 6109 | 6209 | | | 10.0 | 8 | | | | | x | | | |
| Description | | | | | | | | | | | | | | |
| Locator Han D® | 09 99 000 0022 | | | | | | | | x | | | | | |
| Locator Han E® | 09 99 000 0022 | | | | | | | | x | | | | | |
| Locator Han-*Yellock*® | 09 99 000 0341 | | | | | | | x | | | | | | |
| | 09 99 000 0343 | | | | | | | | x | | | | | |
| Locator Han® C | 09 99 000 0304 | | | | | | | | | x | | | | |
| Locator Han D®, Han E® and Han® C | 09 99 000 0376 | | | | | | | x | | | | | | |

[1] for Han® C power contacts, 10 mm²



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## Overview Han® crimping tools

| Crimp contacts Series | Part number | | | | mm² | AWG | Crimping machines | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | male contact silver plated | female contact silver plated | male contact silver plated | female contact gold plated | | | 09 99 000 0813 [3] | 09 99 000 0814 [3] | 09 98 000 6901 [1] | 09 98 000 6902 [1] | 09 98 000 8101 | 09 98 000 8102 | 09 98 000 8103 | 09 98 000 8107 [5] | 09 98 000 9001 | 09 98 000 9002 | 09 98 000 9003 |
| Han D® Signal contacts 09 15 000 .... | 6107 | 6207 | 6127 | 6227 | 0.14 - 0.25 | 26 - 24 | | | x[6] | | x[6] | | | | x | | |
| | 6104 | 6204 | 6124 | 6224 | | | x | | | | | | | | | | |
| | 6107 | 6207 | 6127 | 6227 | 0.37 | 22 | | | x | | x | | | | x | | |
| | 6104 | 6204 | 6124 | 6224 | | | x | | x | | x | | | | x | | |
| | 6103 | 6203 | 6123 | 6223 | 0.5 | 20 | x | | x | | x | | | | x | | |
| | 6105 | 6205 | 6125 | 6225 | 0.75 | 18 | x | | x | | x | | | | x | | |
| | 6102 | 6202 | 6122 | 6222 | 1.0 | 18 | x | | x | | x | | | | x | | |
| | 6101 | 6201 | 6121 | 6221 | 1.5 | 16 | x | | x | | x | | | | x | | |
| | 6106 | 6206 | 6126 | 6226 | 2.5 | 14 | | | x | | x | | | | x | | |
| Han E® Power contacts 09 33 000 .... | 6127 | 6227 | 6117 | 6217 | 0.14 - 0.37 | 26 - 22 | | | | x[6] | | x[6] | | | | x | |
| | 6121 | 6220 | 6122 | 6222 | 0.5 | 20 | x | | | x | | x | | | | x | |
| | 6114 | 6214 | 6115 | 6215 | 0.75 | 18 | x | | | x | | x | | | | x | |
| | 6105 | 6205 | 6118 | 6218 | 1.0 | 18 | x | | | x | | x | | | | x | |
| | 6104 | 6204 | 6116 | 6216 | 1.5 | 16 | x | | | x | | x | | | | x | |
| | 6102 | 6202 | 6123 | 6223 | 2.5 | 14 | x | | | x | | x | | | | x | |
| | 6106 | 6206 | | | 3.0 | 12 | x | | | x | | x | | | | x | |
| | 6107 | 6207 | 6119 | 6221 | 4.0 | 12 | x | | | x | | x | | | | x | |
| Han-*Yellock*® Power contacts 11 05 000 .... | 6101 | 6201 | 6121 | 6221 | 0.14 - 0.37 | 26 - 22 | | | | | | | | x[6] | | | |
| | 6102 | 6202 | 6122 | 6222 | 0.5 | 20 | x | | | | | | | x | | | |
| | 6103 | 6203 | 6123 | 6223 | 0.75 | 18 | x | | | | | | | x | | | |
| | 6104 | 6204 | 6124 | 6224 | 1.0 | 18 | x | | | | | | | x | | | |
| | 6105 | 6205 | 6125 | 6225 | 1.5 | 16 | x | | | | | | | x | | | |
| | 6106 | 6206 | 6126 | 6226 | 2.5 | 14 | x | | | | | | | x | | | |
| | 6107 | 6207 | 6127 | 6227 | 3.0 | 12 | x | | | | | | | | | | |
| | 6108 | 6208 | 6128 | 6228 | 4.0 | 12 | x | | | | | | | | | | |
| Han® C Power contacts 09 32 000 .... | 6104 | 6204 | | | 1.5 | 16 | x | | | | | | x | | | | x |
| | 6105 | 6205 | | | 2.5 | 14 | x | | | | | | x | | | | x |
| | 6107 | 6207 | | | 4.0 | 12 | x | | | | | | x | | | | x |
| | 6108 | 6208 | | | 6.0 | 10 | | x | | | | | x | | | | x |
| | 6109 | 6209 | | | 10.0 | 8 | | x | | | | | x | | | | x |
| Description | | | | | | | | | | | | | | | | | |
| Locator Han-*Yellock*® | 09 99 000 0344 | | | | | | x | | | | | | | | | | |

[1] For using changeable units 09 98 000 6901 / 6902 the TK-M basic machine 09 98 000 6900 is required.
[3] For using of tool head the basic unit CP 600 (09 99 000 0810) is required.
[4] Only male contacts
[5] For using changeable units 09 98 000 8101 - 8107 the TC-SC basic machine 09 98 000 8000 is required.
[6] depending on the wire



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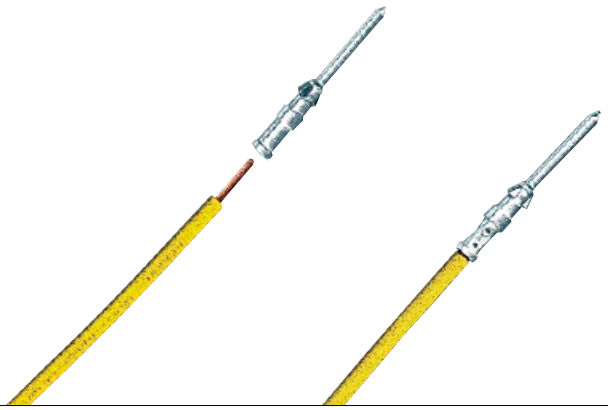
Crimping machine TC-C01

## Features

- ❏ Basic unit in compact construction for pre-stripped wire
- ❏ Simple handling due to ergonomic design
- ❏ For individual, turned male and female contacts
- ❏ Selective processing of male and female HARTING contacts (wire gauge from 0.14 mm² to 10.0 mm², AWG 26 to AWG 8)
- ❏ Automatic contact feed
- ❏ Reproducible, top quality gas-tight crimp connections
- ❏ Non-slip, anti-vibration adjustable feet for setting the height
- ❏ Low noise level
- ❏ Can be transported with carrying handle
- ❏ Removable electric and pneumatic supply connections
- ❏ Maintenance interval counter
- ❏ Minimal setup effort
- ❏ Crimping depth can be set without tools
- ❏ Low maintenance costs
- ❏ Low follow-up costs for maintenance and repair
- ❏ Easy replacement of wearing components

## Technical characteristics

| | |
|---|---|
| Dimensions: | |
| Height | 345 mm |
| Width | 230 mm |
| Depth | 400 mm |
| Total weight: | app. 24 kg |
| Local noise level: | 62 dB (A) |
| Electrical connection: | 230 V, 50 Hz |
| Power rating: | 0.20 kW |
| Compressed air connection: | 6 bar |
| Control system: | PLC |
| Work cycle trigger: | Footswitch |
| Machine work cycle: | 1 second |
| Crimp type: | Four-point crimping |
| Contact feed: | Vibratory bowl feed |
| Stroke counters: | Resettable daily counter and permanent counter |





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## Crimping machine TC-C01

| Identification | Part number |
|---|---|
| Crimping machine TC-C01 | |
| for Han D® contacts | 09 98 000 9001 |
| Han E® contacts | 09 98 000 9002 |
| Han® C contacts | 09 98 000 9003 |

## Included in the delivery

- ❏ Crimping machine TC-C01
  - – with 2.0 m connection cable and grounding plug
  - – with 2.0 m pneumatic hose, quick-release coupling and N6 plug-in nipple
- ❏ Footswitch
- ❏ Carrying handle
- ❏ Operating instructions
- ❏ Declaration of conformity

## Options

Pneumatic maintenance unit

**Stock items in bold type**

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Crimping machine TK-M

## Features

- ❑ Fast stripping and crimping in one operation
- ❑ Basic unit in compact construction
- ❑ Simple handling because of well-arranged construction with touchscreen controlling
- ❑ For individual, turned male and female contacts (for the HARTING series Han D®, Han E®)
- ❑ Selective processing of male and female contacts (Wire gauge from 0.14 mm² to 4.0 mm², AWG 26 to AWG 12)
- ❑ Contact magazine with filling control
- ❑ Reproducible, top quality gas-tight crimp connections
- ❑ Infinitely variable adjustment parameters
  – Stripping depth
  – Stripping length
  – Crimping depth
  – Crimp contact feed rate
- ❑ Rotatable vibration feeder and actuator in basic unit
- ❑ Low noise level
- ❑ For oil-free compressed air
- ❑ Very low setup effort
- ❑ Low maintenance costs of the modular construction

## Technical characteristics

| | |
|---|---|
| Dimensions: | |
| Height | 580 mm |
| Width | 470 mm |
| Depth | 470 mm |
| Total weight: | Approx. 60 kg |
| Local noise level: | < 75 dB (A) |
| Drive: | Electro-pneumatic |
| Electrical connection: | 230 V, 50 Hz |
| Power rating: | Approx. 0,75 kW |
| Pneumatic pressure: | 6 bar |
| Compressed air connection: | 3 dm³ / work cycle |
| Control system: | PLC |
| Work cycle trigger: | Sensor |
| Machine work cycle: | 1.5 seconds (stripping and crimping) |
| Crimp type: | Four-notch crimping |
| Contact feed: | Vibratory bowl feed |
| Stroke counters: | Resettable daily counter and quantity preselection |

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## Crimping machine TK-M

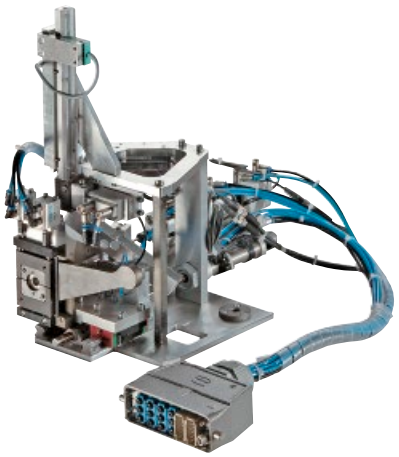
| Identification | Part number |
|---|---|
| Crimping machine TK-M<br>(Basic machine<br>without interchangeable unit) | 09 98 000 6900 |
| Interchangeable units for Han D®<br>Han E® | 09 98 000 6901<br>09 98 000 6902 |

## Pack contents

- ❏ Crimping machine TK-M
  - – with one mounted interchangeable unit
  - – with 2.0 m connection cable and grounding plug
  - – with 2.0 m pneumatic hose with plug-in nipple N6
- ❏ Plug gauges for setting the crimping
- ❏ Centering bush for positioning the plug gauges
- ❏ Drawer for holding the contacts when the magazine is emptied
- ❏ Draw for insulation remains
- ❏ Tool set for setting
- ❏ 1 set of stripping blades
- ❏ Operating instructions
- ❏ Declaration of conformity

## Options

Interchangeable unit







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Crimping machine TC-SC

## Features

- ❏ Fast stripping and crimping in one operation
- ❏ Basic unit in compact construction
- ❏ Simple handling because of well-arranged construction with touchscreen controlling
- ❏ For individual, turned male and female contacts
  (for the HARTING series Han D®, Han E®, Han® C, Han P®, Han-*Yellock*®, D- Sub)
- ❏ Selective processing of male and female contacts
  (Wire gauge from 0.14 mm² to 10.0 mm², AWG 28 to AWG 8)
- ❏ Contact magazine with filling control
- ❏ Reproducible, top quality gas-tight crimp connections
- ❏ Motor-driven variable adjustment parameters
  – Stripping depth
  – Stripping length
  – Crimping depth
  – Wire position
- ❏ Infinitely variable adjustment parameters
  – Wire retention force
  – Crimp contact feed rate
- ❏ Low noise level
- ❏ For oil-free compressed air
- ❏ Very low setup effort
- ❏ Low maintenance costs of the modular construction

## Technical characteristics

| | |
|---|---|
| Dimensions: | |
| Height | 480 mm |
| Width | 650 mm |
| Depth | 560 mm |
| Total weight: | Approx. 75 kg |
| Local noise level: | < 75 dB (A) |
| Drive: | Electro-pneumatic |
| Electrical connection: | 230 V, 50 Hz |
| Power rating: | 1.0 kW |
| Pneumatic pressure: | 6 bar |
| Compressed air connection: | 3 dm³ / work cycle |
| Control system: | PLC |
| Work cycle trigger: | Sensor |
| Machine work cycle: | 2 seconds (stripping and crimping) |
| Crimp type: | Four-notch crimping |
| Contact feed: | Vibratory bowl feed |
| Stroke counters: | Resettable daily counter and quantity preselection |

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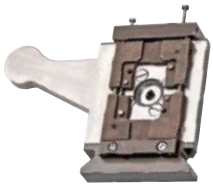
## Crimping machine TC-SC

| Identification | Part number |
|---|---|
| **Crimping machine TC-SC** (Basic machine without interchangeable unit) | 09 98 000 8000 |
| Interchangeable units for Han D® | 09 98 000 8101 |
| Han E® | 09 98 000 8102 |
| Han® C | 09 98 000 8103 |
| D-Sub | 09 98 000 8104 |
| D-Sub | 09 98 000 8105 |
| Han P® | 09 98 000 8106 |
| Han-*Yellock*® | 09 98 000 8107 |
| Crimp tool for Han® C | 09 98 300 8103 |

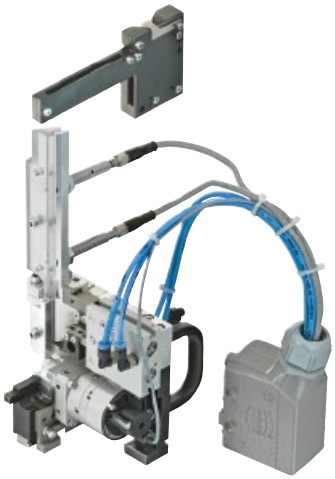


## Pack contents

- ❏ Crimping machine TC-SC
  - – with one mounted interchangeable unit
  - – with 2.0 m connection cable and grounding plug
  - – with 2.0 m pneumatic hose with plug-in nipple N6
- ❏ Tool set for adjustments
- ❏ 1 set of stripping blades
- ❏ Operating instructions
- ❏ Declaration of conformity

## Options

Interchangeable unit







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Crimping machine BK

## Features

- ❑ Fast stripping and crimping in one operating
- ❑ Simple handling by quick change tool and stripper
- ❑ For HARTING crimp contacts D-Sub
- ❑ Selectives processing of male and female contacts
- ❑ Wire gauges from 0.09 mm² up to 0.5 mm², AWG 28 up to AWG 20
- ❑ Hand wheel for manual adjustments
- ❑ Maintenance-friendly through needle bearing rail
- ❑ Automatic exhaust of the isolation remainders
- ❑ Produces consistent high quality gas tight crimp connections
- ❑ With crimp force monitor
- ❑ Setting parameters with raster rotary button
  – Depth of insulation stripping
  – Length of insulation stripping
  – Crimping heigth on wire
  – Crimping heigth on isulation
  – Wire retainer position
  – Band thrust
  – Wire position in the crimp contact
- ❑ Non slip and anti-vibration feet
- ❑ Low noise level
- ❑ For unlubricated compressed air
- ❑ Low maintenance costs

## Technical characteristics

| | |
|---|---|
| Dimensions | |
| Height | 690 mm / 1400 mm with a contact reel |
| Width | 420 mm |
| Depth | 430 mm |
| Total weigth | approx. 72 kg |
| Localized noise level | 85 dB (A) |
| Drive | electro pneumatic |
| Power supply | 230 V, 50/60 Hz, 2.5 A |
| Consumption | 0.75 kW |
| Pneumatic pressure | 6 bar |
| Control system | PLC |
| Stripping device | Typ 514 |
| Suction apparatus | 2000.0900.20 |
| Work cycle trigger | Sensor |
| Work cycle | 0.35 s. |
| Ilumination | integrated tool light 20001326 |
| Motor speed | 440 –2000 rpm |
| Stroke counter | Daywise and fixed |



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## Crimping machine BK

| Identification | Part number |
|---|---|
| Crimping machine BK<br>(without quick change tool) | 09 98 000 5000 |
| Quick change tool for<br>D-Sub (AWG 28-24)<br>D-Sub (AWG 24-20)<br>D-Sub high density (AWG 26-24) | <br>09 98 000 3008<br>09 98 000 3009<br>09 98 000 3012 |

## Pack contents

- ❏ Crimping machine BK
  - – with role owner and guide plate
  - – with 2.0 m connection cable and shockproof plug
  - – with 2.0 m pneumatic hose with plug-in nipple N9
- ❏ Oiler bottle for the lubricating of the crimping contacts
- ❏ Tool set for setting
- ❏ 1 set of stamps for wire and isolation-crimp
- ❏ 1 anvil one-piece for wire and isolation-crimp
- ❏ 1 set of stripping blades
- ❏ 1 litre of contact oil
- ❏ Operating instructions
- ❏ Declaration of conformity

## Options

V-Blades for special wires
on request





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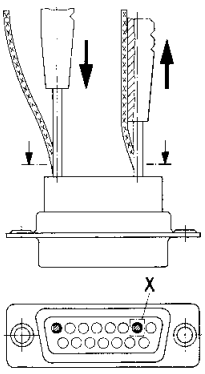
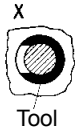
## Tools for crimp termination – D-Sub-S, D-Sub-HD, DIN 41612

| Identification | Part number | |
|---|---|---|
| **Service crimp tool** | | for standard contacts for high density contacts |
| for single D-Sub **standard** contacts | 09 99 000 0175 | |
| for single D-Sub **high density** contacts | 09 99 000 0535 | |
| **HARTING-Crimp tool** | | |
| for 500 bandoliered D-Sub **standard** contacts | 09 99 000 0169 | |
| for 500 bandoliered D-Sub **high density** contacts | 09 99 000 0597 | |
| **HARTING-Semi-automatic crimping device** | | |
| Main drive foot-operated 220 V / 50 Hz | 09 99 000 0246 | |
| Crimping head for bandoliered D-Sub **standard** contacts | 09 99 000 0253 | Wire gauge 0.09-0.56 mm² (AWG 28-20) |
| for **DIN 41612** contacts, types BC / har-bus® 64 | 09 99 000 0252 | 0.09 - 0.5 mm² |
| FC 1 | 09 99 000 0249 | 0.09 - 0.25 mm² |
| FC 2 | 09 99 000 0250 | 0.14 - 0.56 mm² |
| FC 3 | 09 99 000 0251 | 0.5 - 1.5 mm² |
| BC / har-bus® 64 | 09 99 000 0628 | 0.13 mm² (solid wire) |
| Reel holder for 10 000 contacts | 09 99 000 0158 | |
| **Insertion and removal tool** | | |
| for single D-Sub **standard** contacts | 09 99 000 0171 | |
| for single D-Sub **high density** contacts | 09 99 000 0513 | |




**Assembly of crimp contacts**
After crimping the stranded wire to the contact using a hand tool or automatic crimping device, insert the contact into the chamber with the tool, working from the wiring side. You will hear the contacts snap home and to check that they are securely in place, give the wire a gentle pull.

**Removing crimp contacts**
Position the tool from the wiring side as shown in the diagram below and insert into the contact chamber. The contact can then easily be removed from the wiring side together with the wire itself and reinserted in a different chamber. The tool is designed for a maximum insulation diameter of Ø 1.7 mm.

Stripping length: 2.5 + 0.5 mm



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# Notes





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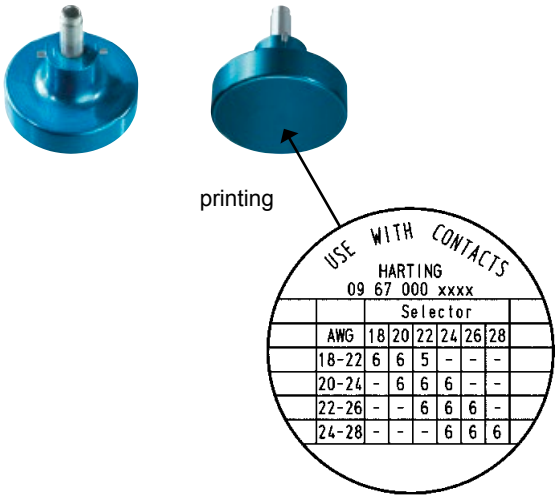
## Tools for crimp termination – D-Sub-S, D-Sub-HD

| Identification | Part number | |
|---|---|---|
| **Crimp tool**<br>for turned male and female contacts AWG 28-18<br>4 indent crimp in acc. to MIL 22 520/2-01 | 09 99 000 0501 | |

| Contact Part No. | Gauge | Crimp tool selection No. |
|---|---|---|
| **09 67 000 3x76** | AWG 18, 20, 22 | 6 for AWG 18 and AWG 20, 5 for AWG 22 |
| **09 67 000 8x76** | AWG 20, 22, 24 | 6 |
| **09 67 000 5x76** | AWG 22, 24, 26 | 6 |
| **09 67 000 7x76** | AWG 24, 26, 28 | 6 |

| | | |
|---|---|---|
| Locator for crimp tool<br>Details see table | 09 99 000 0531 |  |



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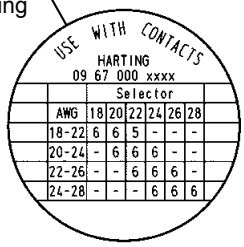
# Tools for crimp contacts

## Tools for crimp termination – D-Sub-M

| Identification | Part number | Drawing |
|---|---|---|
| **Hand crimp tool**<br>for ***signal*** contacts | 09 99 000 0501 | printing   Wire gauge AWG 18 – 28 |
| Die<br>(To be ordered separately) | 09 99 000 0531 | |
| **Hand crimp tool**<br>for ***power*** contacts | 09 99 000 0509 | |
| Positioner for male and female contacts<br>(To be ordered separately) | 09 99 000 0504 | **Contact Part No.** / **Gauge** / **Tool setting**<br>**09 69 182 x420** – AWG 16, 18, 20 – 3 for AWG 16, 2 for AWG 18 and AWG 20<br>**09 69 282 x420** – AWG 16, 18, 20 – 3 for AWG 16, 2 for AWG 18 and AWG 20<br>**09 69 182 x421** – AWG 12, 14 – 5 for AWG 12 and 4 for AWG 14<br>**09 69 282 x421** – AWG 12, 14 – 5 for AWG 12 and 4 for AWG 14<br>**09 69 182 x422** – AWG 10, 12 – 7 for AWG 10 and 6 for AWG 12<br>**09 69 282 x422** – AWG 10, 12 – 7 for AWG 10 and 6 for AWG 12<br>**09 69 182 x423** – AWG 8, 10 – 7 for AWG 8 and 6 for AWG 10<br>**09 69 282 x423** – AWG 8, 10 – 7 for AWG 8 and 6 for AWG 10 |
| Positioner for male contacts<br>(To be ordered separately.) | 09 99 000 0522 | **Contact Part No.** / **Gauge** / **Tool setting**<br>**09 69 282 x821** – AWG 12, 14 – 5 for AWG 12 and 4 for AWG 14<br>**09 69 282 x823** – AWG 8, 10 – 7 for AWG 8 and 6 for AWG 10 |
| Positioner for female contacts<br>(To be ordered separately.) | 09 99 000 0521 | **Contact Part No.** / **Gauge** / **Tool setting**<br>**09 69 182 x821** – AWG 12, 14 – 5 for AWG 12 and 4 for AWG 14<br>**09 69 182 x823** – AWG 8, 10 – 7 for AWG 8 and 6 for AWG 10 |
| **Hand crimp tool**<br>for ***coaxial*** contacts, solder/crimp version[1)] | 09 99 000 0503 | |
| Die<br>(To be ordered separately) | 09 99 000 0508 | Contact Part No. / Cavity<br>09 69 181 x230 / 09 69 281 x230 – B<br>09 69 181 x141 / 09 69 281 x141 – C<br>09 69 181 x140 / 09 69 281 x140 – B |
| Die<br>(To be ordered separately) | 09 99 000 0515 | Contact Part No. / Cavity<br>09 69 181 x143 / 09 69 281 x143 – A |
| Die<br>(To be ordered separately) | 09 99 000 0519 | Contact Part No. / Cavity<br>09 69 181 x233 / 09 69 281 x233 – B |

[1)] Only the outer ferrule is crimped (inner conductor is soldered)





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## Tools for crimp termination – D-Sub-M

| Identification | Part number | |
|---|---|---|
| **Hand crimp tool**<br>for ***coaxial*** contacts, crimp/crimp version[1], suitable for ***inner*** contact | 09 99 000 0501 | |
| Inner contact die (To be ordered separately) | 09 99 000 0507 | |

| Contact Part No. |
|---|
| 09 69 182 x140 |
| 09 69 282 x140 |
| 09 69 182 x230 |
| 09 69 282 x230 |
| 09 69 182 x232 |
| 09 69 282 x232 |
| 09 69 182 x233 |
| 09 69 282 x233 |

| Identification | Part number | |
|---|---|---|
| **Hand crimp tool**<br>for ***coaxial*** contacts, crimp/crimp version[1], suitable for ***outer*** ferrule | 09 99 000 0503 | |
| Outer contact die (To be ordered separately) | 09 99 000 0508 | |

| Contact Part No. | Cavity |
|---|---|
| 09 69 182 x140<br>09 69 282 x140 | B |
| 09 69 182 x230<br>09 69 282 x230 | B |

| Identification | Part number |
|---|---|
| Outer contact die (To be ordered separately) | 09 99 000 0518 |

| Contact Part No. | Cavity |
|---|---|
| 09 69 182 x232<br>09 69 282 x232 | A |

| Identification | Part number |
|---|---|
| Outer contact die (To be ordered separately) | 09 99 000 0519 |

| Contact Part No. | Cavity |
|---|---|
| 09 69 182 x233<br>09 69 282 x233 | B |

[1] Both inner and outer conductor are crimped



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## Tools for crimp termination – D-Sub-M

| Identification | Part number | |
|---|---|---|
| Hand crimp tool<br>for ***high voltage*** contacts | 09 99 000 0501 | |
| Die for male and female contacts (To be ordered separately.) | 09 99 000 0533 | |
| Extraction tool<br>for ***coaxial, pneumatic, power*** and ***high voltage*** contacts | 09 99 000 0512 | |

| Contact Part No. | Gauge | Tool setting |
|---|---|---|
| **09 69 182 2550** | AWG<br>24, 26, 28, 30 | 5 for AWG 24 and 26, 4 for AWG 28 and 3 for AWG 30 |
| **09 69 282 2550** | AWG<br>24, 26, 28, 30 | 5 for AWG 24 and 26, 4 for AWG 28 and 3 for AWG 30 |





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## Tools for crimp termination – InduCom

| Identification | Part number | |
|---|---|---|
| **Hexagonal head screwdriver**<br>for hoods with hexagonal screws | 61 03 600 0021 | |
| **Crimp tool**<br>for flange and ferrule | 61 03 600 0020 | |
| Inserts for crimp tool | | |

| Part number | Width of hexagonal nut [mm] |
|---|---|
| 61 03 000 0179 | 5.0 |
| 61 03 000 0180 | 5.5 |
| 61 03 000 0098 | 6.0 |
| 61 03 000 0099 | 6.5 |
| 61 03 000 0100 | 7.0 |
| 61 03 000 0101 | 7.5 |
| 61 03 000 0102 | 8.0 |
| 61 03 000 0103 | 8.5 |
| 61 03 000 0104 | 9.0 |
| 61 03 000 0105 | 9.5 |
| 61 03 000 0174 | 10.0 |
| 61 03 000 0172 | 10.5 |
| 61 03 000 0168 | 11.0 |
| 61 03 000 0169 | 11.5 |
| 61 03 000 0175 | 12.0 |
| 61 03 000 0176 | 12.5 |
| 61 03 000 0177 | 13.0 |
| 61 03 000 0178 | 13.5 |
| 61 03 000 0173 | 14.0 |

| | | |
|---|---|---|
| **Mounting tool**<br>for flange | | |
| for D-Sub hoods (9-37 contacts) | 61 03 600 0017 | |
| for D-Sub hoods (50 contacts) | 61 03 600 0018 | |
| **Insertion and removal tool**<br>for contacts | 09 99 000 0171 | |



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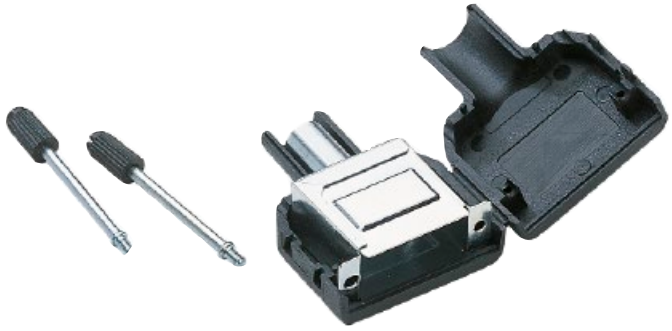
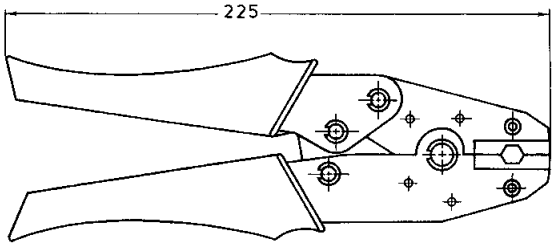
# Crimp tools for screened hoods

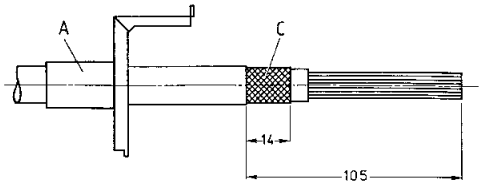


## Tool / Assembly instructions

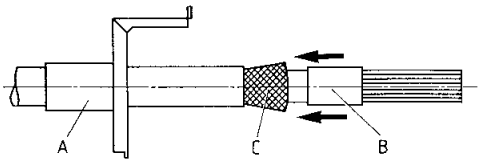
| Identification | No. of contacts | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Crimp tool<br>for screened hoods | | 09 99 000 0233 |  | |
| Crimp tool dies | 9<br>15<br>25<br>37 | 09 99 000 0235<br>09 99 000 0235<br>09 99 000 0236<br>09 99 000 0237 | | |

Assembly instructions for screened hoods

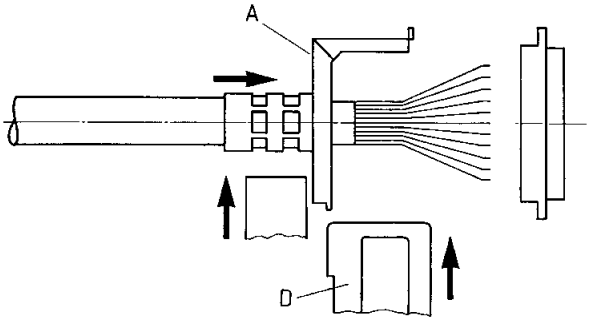
Place the metal screen part (A) on the cable.
Prepare the cable for termination.



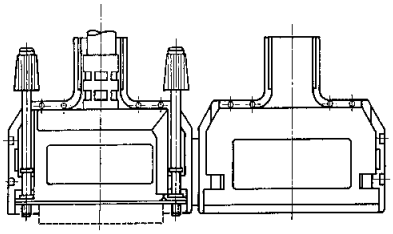

Place the inner ferrule (B) between conductors and the outer braid (C).




Terminate the D-Sub connector.
Put the metal screen part (A) over the braid and crimp directly over the inner ferrule, ensuring that the correct crimp tool die is used.
Slide in the other metal screen part (D).




Push back the terminated connector into the assembled screen.
Put the assembled connector, screen and knurled screws into the thermoplastic hood and snap closed.







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## Modular tooling system for starting connector press-in

The diversity of connector types with press-in terminations and varying termination styles make it necessary to have a simple, flexible tooling system that can be continuously updated.

The HARTING modular tooling system has significant advantages in terms of economic assembly of the many connector types with press-in terminations. The basic modules of the tooling system which will always be required are:

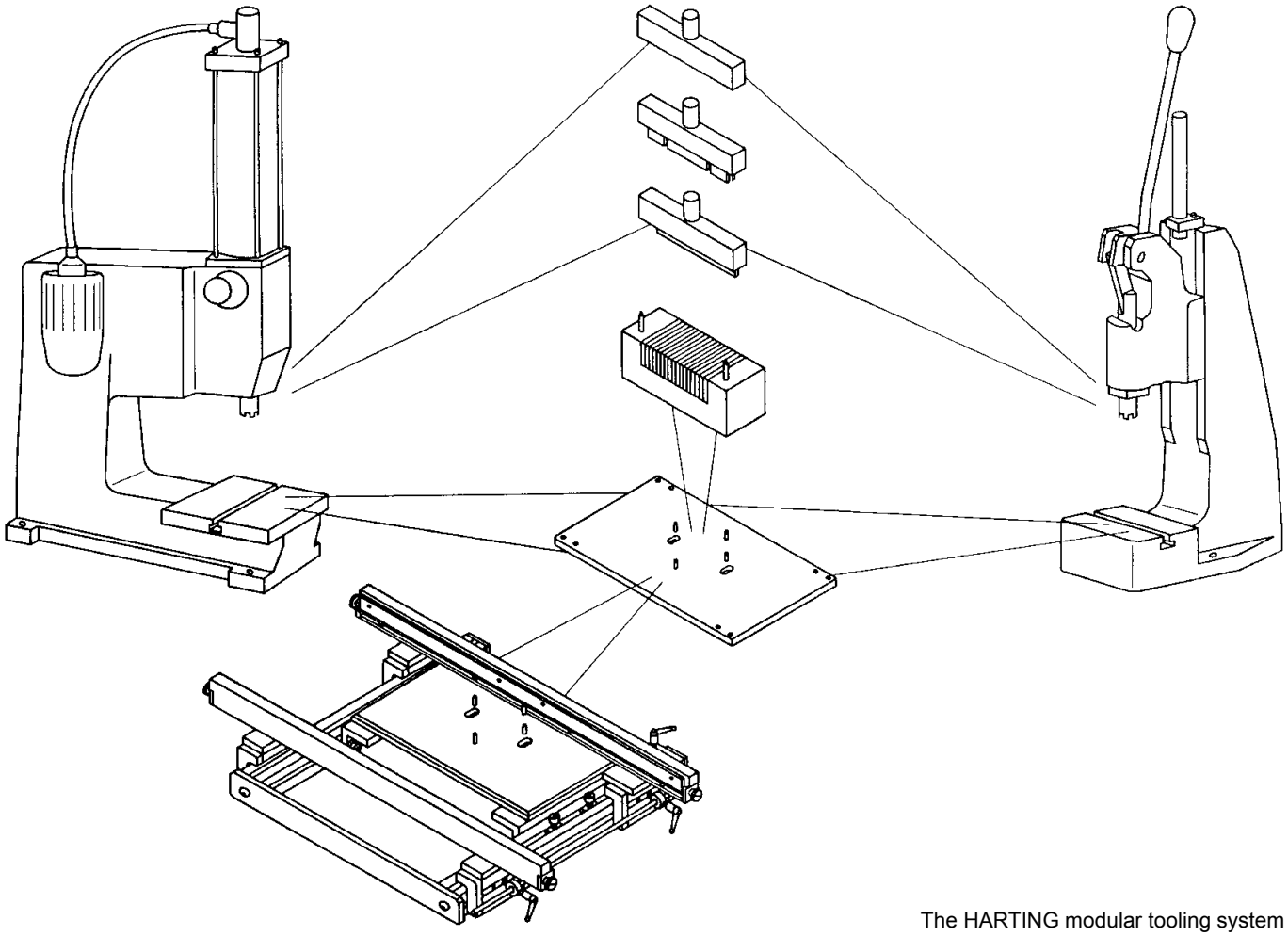
- Press
- Top tool
- Bottom tool
- Base plate

To increase automation and productivity the following modules may be added to the basic assembly:

- Guide frame with base plate
  for accurate positioning of the pcb
  up to a length of 600 mm

- Guide frame ”Standard“
  for hand bench press and pneumatic press
  and pcb height of 123.5 up to 309.5 mm

- Guide frame ”Long“
  for pneumatic press and
  pcb height of 123.5 up to 668.5 mm



The HARTING modular tooling system



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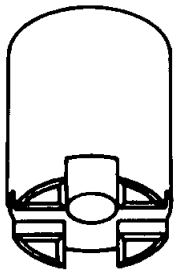
## Handling indications

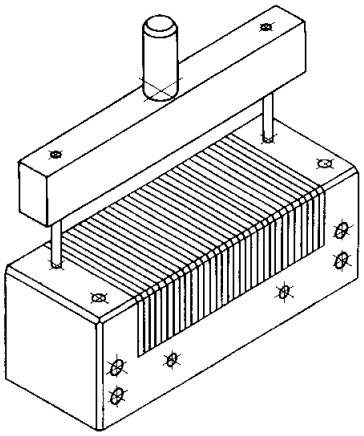
When setting up an assembly machine it is not necessary to set the working height of the press and adjust the base plate more than once. There is no need for further adjustments. All the other adaptations for various applications are performed efficiently and are reliant by various combinations of individual modules.



Ram with cross-shaped groove

## Positioning the bottom tool in relation to the top tool

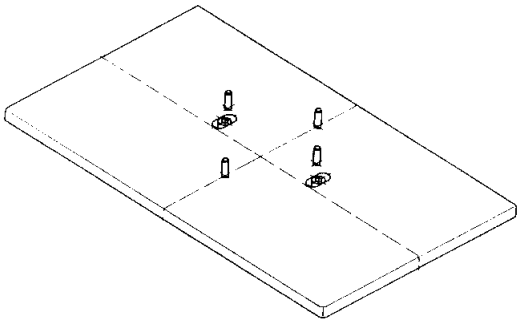
The ram of the HARTING press is generally provided with a cross-shaped groove which accurately positions the top tool in steps of 90°.



Positioning the bottom tool in relation to top tool

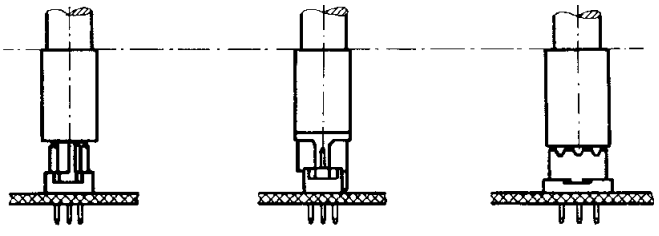
Two guide pins position the bottom tool in relation to the top tool simply and accurately.

**These guide pins cannot be used for positioning the pcb or the connector!**



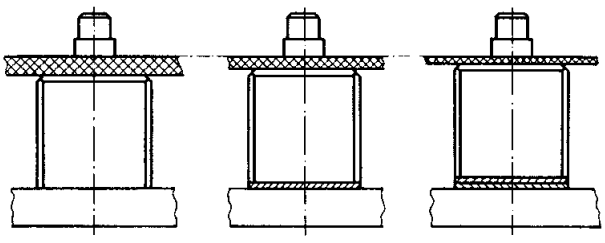
Base plate with pairs of location pins at 90°

Two pairs of pins on the base plate locate the bottom tool in relation to the top tool in steps of 90°.



## Height compensation

- Various overall heights of connectors are accommodated by type-specific top tools.
- Various pcb thicknesses are accommodated by the use of spacers between the bottom tool and base plate.







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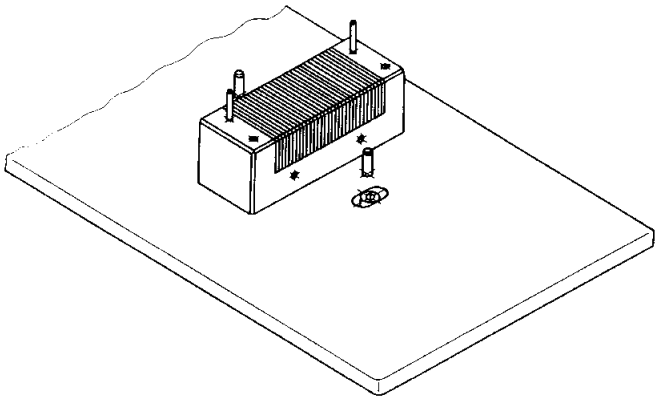
## Handling indications

### Range of applications for the bottom tool

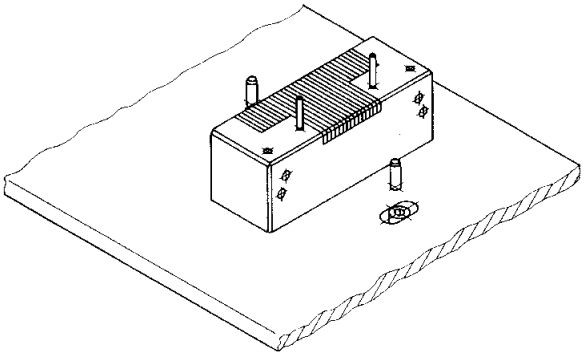
One bottom tool can be used to assemble connectors with straight or angled press-in terminations.

When pressing in the connectors with angled press-in terminations the positioning pins remain in the bottom tool and serve as guide pins for the connector.



Bottom tool set for assembling connectors with angled pins

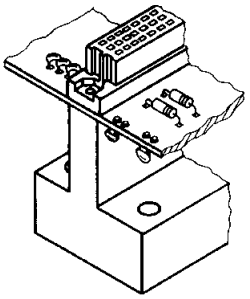
By rotating the bottom tool in steps of 90° and relocating the positioning pins it is possible to assemble half-length connectors with angled press-in terminations.



Bottom tool set for assembling half-length connectors with angled pins

### Bottom tool (narrow version)

In addition to the square bottom tool with multi-functional properties, HARTING offers the alternative of a narrow bottom tool for assembling connectors with straight press-in terminations. This tool supports the pcb within the press-in connector zone and therefore makes it possible to assemble connectors where electronic components are to be placed in close proximity.



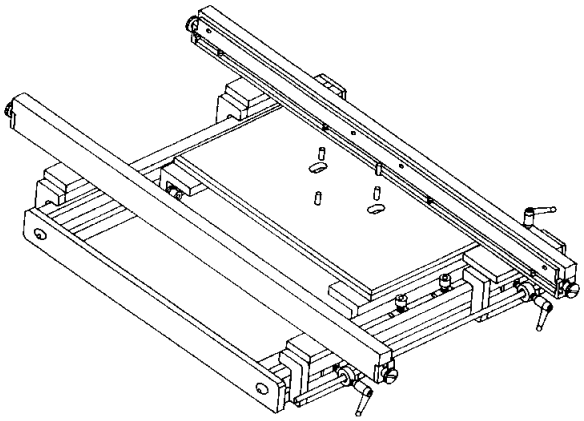
Narrow version of the bottom tool for special applications

### Guide frame

The guide frame screwed to the base plate ensures the correct positioning of the pcb in relation to the top and bottom tools and permits a much higher rate of assembly.

Both guide rails are adjustable to accommodate various pcb sizes.

A spring-loaded supporting rail lifts the pcb away from the bottom tool after the press-in operation ensuring that no damage occurs to the conductors as it passes through the machine.



Guide frame for positioning the pcb in relation to the top and bottom tools



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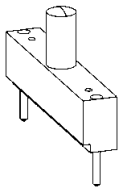
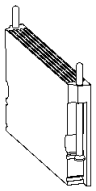
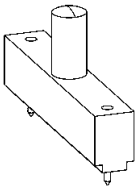
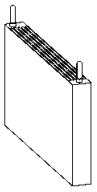
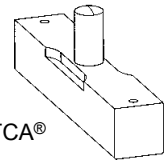
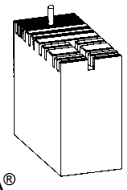
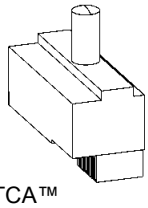
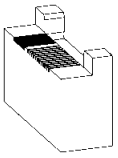
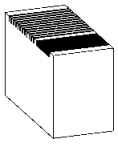
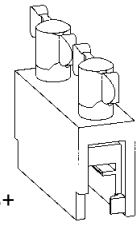
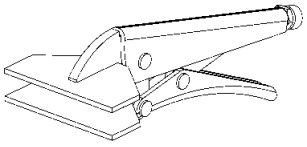
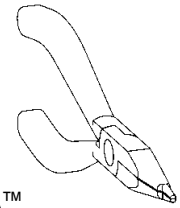
# Tools for press-in contacts

For a reliable and safe press-in process HARTING has developed a special tooling system.
Each tooling is adapted to the special requirements of the individual connector range, thus a good handling and quick adjustment is guaranteed.

| Identification | Part number | Drawing |
|---|---|---|
| Top tool for AdvancedTCA® B+<br><br>Bottom tool for AdvancedTCA® B+ | 16 99 000 0001 000<br><br>16 99 000 0002 000 |  Top tool for AdvancedTCA® B+<br>  Bottom tool for AdvancedTCA® B+ |
| Top tool for MicroTCA™<br><br>Bottom tool for MicroTCA™ | 16 99 000 0003 000<br><br>16 99 000 0004 000 |  Top tool for MicroTCA™<br>  Bottom tool for MicroTCA™ |
| Top tool for AdvancedTCA® Power<br>Male and female connector<br><br>Bottom tool for AdvancedTCA® Power<br>Male and female connector | 02 99 000 0002<br><br>16 99 000 0011 000 |  Top tool for AdvancedTCA® Power and MicroTCA™ Power, module version<br>  Bottom tool for AdvancedTCA® Power |
| Top tool for MicroTCA™ Power<br>Module version<br>Backplane version<br><br>Bottom tool for MicroTCA™ Power<br>Module version<br>Backplane version | 02 99 000 0002<br>16 99 000 0008 000<br><br>16 99 000 0010 000<br>16 99 000 0009 000 |  Top tool for MicroTCA™ Power, backplane version<br>  Bottom tool for MicroTCA™ Power, module version<br>  Bottom tool for MicroTCA™ Power, backplane version |
| Removal tool for AdvancedTCA® B+<br><br>Removal tool for MicroTCA™<br><br><br>Repair pliers for MicroTCA™ | 16 99 000 0005 000<br><br>16 99 000 0007 000<br><br><br>16 99 000 0006 000 |  Removal tool for AdvancedTCA® B+<br>  Removal tool for MicroTCA™<br>  Repair pliers for MicroTCA™ |





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## Discrete tooling system – harbus® HM

For economical and safe press-in of harbus® HM connectors with 5+2 and 8+2 rows, HARTING has developed a discrete tooling system.

Due to its modular structure it can be adapted to any connector configuration that needs to be pressed-in extremely quickly and securely.

Therefore a top and a bottom tool for each connector style is available. These tools are inserted in a top or bottom carrier tool with a groove, thus guaranteeing exact position of the top and bottom tools and the connectors.

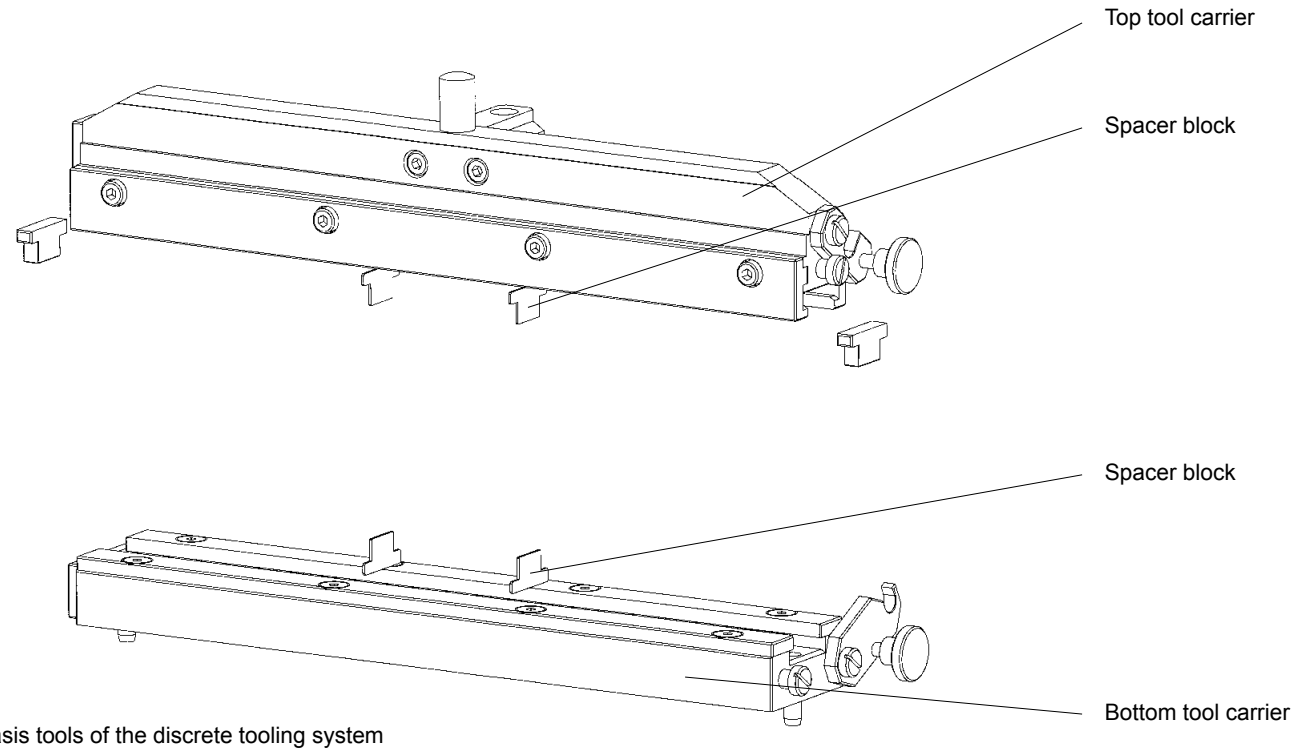
To use identical carrier tools for all connector configurations, HARTING offer spacer blocks to fill gaps between adjacent top or bottom tools.

The carrier tool is either completely filled with top or bottom tools or respective spacer blocks, making it possible to press-in single modules.

To press-in female connectors with pre-installed upper shields, separate top and bottom tools are available.

For lower shield press-in the tooling can be changed easily.

For further information please check our operating instructions or contact your HARTING representative.




Basis tools of the discrete tooling system



### Basis tools for all connector types

| Part number connector | Tool identification | Part number tool |
|---|---|---|
| 17 xx xxx xxxx | Top tool carrier | 17 99 000 0012 |
| 17 xx xxx xxxx | Bottom tool carrier | 17 99 000 0013 |
| 17 xx xxx xxxx | Top tool carrier 3U | 17 99 000 0073 |
| 17 xx xxx xxxx | Bottom tool carrier 3U | 17 99 000 0074 |
| 17 xx xxx xxxx | Spacer block 0.67 mm (CompactPCI) | 17 99 000 0057 |
| 17 xx xxx xxxx | Spacer block 5 mm | 17 99 000 0056 |

| Part number connector | Tool identification | Part number tool |
|---|---|---|
| 17 xx xxx xxxx | Spacer block 25 mm | 17 99 000 0055 |
| 17 xx xxx xxxx | Spacer block 38 mm | 17 99 000 0054 |
| 17 xx xxx xxxx | Spacer block 44 mm | 17 99 000 0053 |
| 17 xx xxx xxxx | Spacer block 50 mm | 17 99 000 0052 |
| 17 xx xxx xxxx | Centering plate female left | 17 99 000 0060 |
| 17 xx xxx xxxx | Centering plate female right | 17 99 000 0061 |



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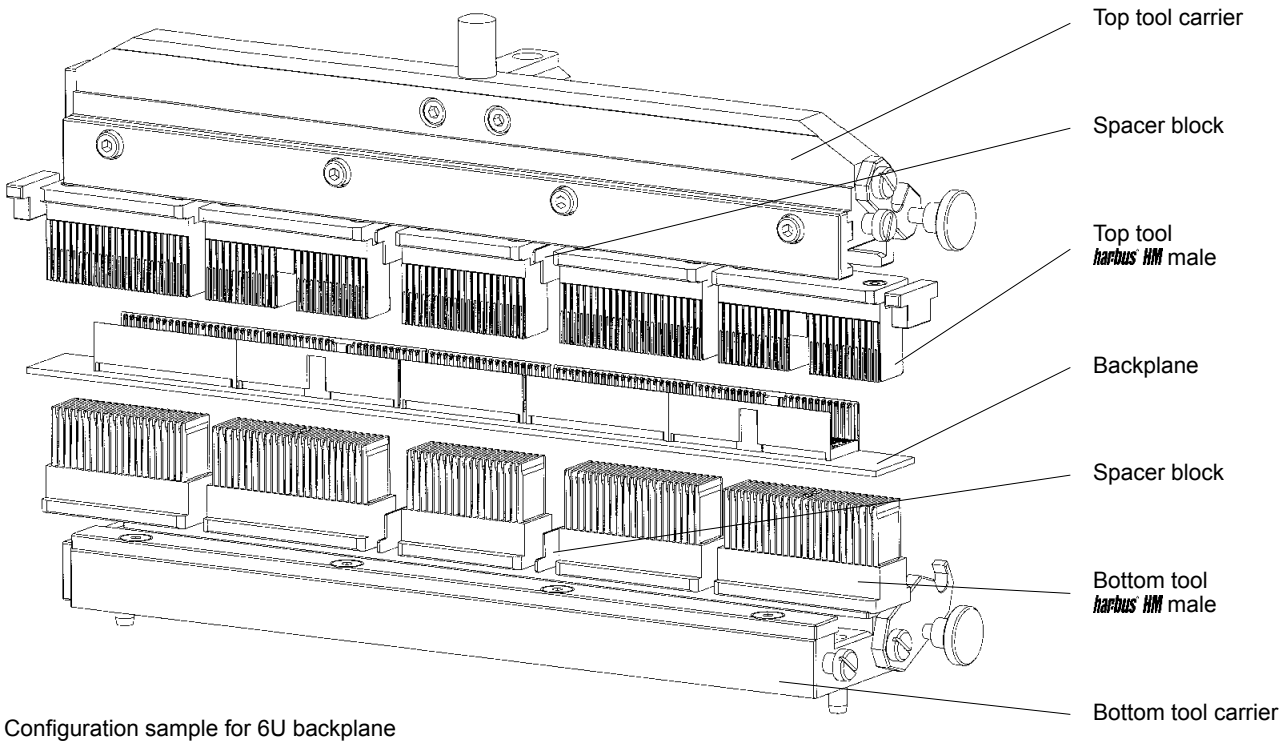
## Discrete tooling system – har-bus® HM




Configuration sample for 6U backplane

### Tools for straight male connectors

| Part number connector | Tool identification | Part number tool | Part number connector | Tool identification | Part number tool |
|---|---|---|---|---|---|
| 17 01 xxx xxxx | Top tool, male, type A | 17 99 000 0014 | 17 11 xxx xxxx | Top tool, male, type D | 17 99 000 0022 |
| 17 01 xxx xxxx | Bottom tool, male, type A | 17 99 000 0026 | 17 11 xxx xxxx | Bottom tool, male, type D | 17 99 000 0028 |
| 17 02 xxx xxxx | Top tool, male, type B | 17 99 000 0020 | 17 12 xxx xxxx | Top tool, male, type E | 17 99 000 0023 |
| 17 02 xxx xxxx | Bottom tool, male, type B | 17 99 000 0026 | 17 12 xxx xxxx | Bottom tool, male, type E | 17 99 000 0028 |
| 17 04 xxx xxxx | Top tool, male, type B | 17 99 000 0019 | 17 13 xxx xxxx | Top tool, male, type AB | 17 99 000 0015 |
| 17 04 xxx xxxx | Bottom tool, male, type B | 17 99 000 0025 | 17 13 xxx xxxx | Bottom tool, male, type AB | 17 99 000 0024 |
| 17 05 xxx xxxx | Top tool, male, type B | 17 99 000 0018 | 17 14 xxx xxxx | Top tool, male, type AB | 17 99 000 0016 |
| 17 05 xxx xxxx | Bottom tool, male, type B | 17 99 000 0024 | 17 14 xxx xxxx | Bottom tool, male, type AB | 17 99 000 0025 |
| 17 03 xxx xxxx | Top tool, male, type C | 17 99 000 0021 | 17 15 xxx xxxx | Top tool, male, type AB | 17 99 000 0017 |
| 17 03 xxx xxxx | Bottom tool, male, type C | 17 99 000 0027 | 17 15 xxx xxxx | Bottom tool, male, type AB | 17 99 000 0026 |





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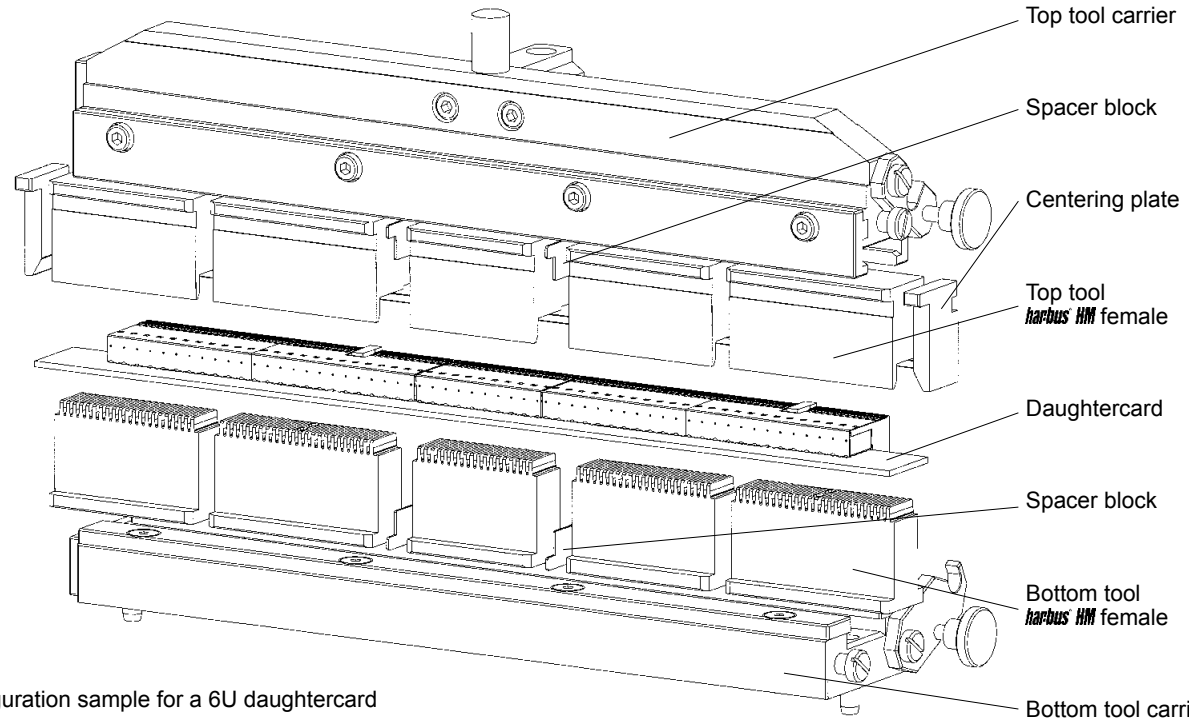
## Discrete tooling system – harbus® HM




Configuration sample for a 6U daughtercard

### Tools for angled female connectors

| Part number connector | Tool identification | Part number tool | Part number connector | Tool identification | Part number tool |
|---|---|---|---|---|---|
| 17 21 xxx xxxx | Top tool, female, type A | 17 99 000 0029 | 17 31 xxx xxxx | Top tool, female, type D | 17 99 000 0042 |
| 17 21 xxx xxxx | Bottom tool, female, type A | 17 99 000 0046 | 17 31 xxx xxxx | Bottom tool, female, type D | 17 99 000 0048 |
| 17 22 xxx xxxx | Top tool, female, type B | 17 99 000 0038 | 17 32 xxx xxxx | Top tool, female, type E | 17 99 000 0042 |
| 17 22 xxx xxxx | Bottom tool, female, type B | 17 99 000 0046 | 17 32 xxx xxxx | Bottom tool, female, type E | 17 99 000 0048 |
| 17 24 xxx xxxx | Top tool, female, type B | 17 99 000 0036 | 17 33 xxx xxxx | Top tool, female, type AB | 17 99 000 0032 |
| 17 24 xxx xxxx | Bottom tool, female, type B | 17 99 000 0045 | 17 33 xxx xxxx | Bottom tool, female, type AB | 17 99 000 0044 |
| 17 25 xxx xxxx | Top tool, female, type B | 17 99 000 0034 | 17 34 xxx xxxx | Top tool, female, type AB | 17 99 000 0058 |
| 17 25 xxx xxxx | Bottom tool, female, type B | 17 99 000 0044 | 17 34 xxx xxxx | Bottom tool, female, type AB | 17 99 000 0045 |
| 17 23 xxx xxxx | Top tool, female, type C | 17 99 000 0040 | 17 35 xxx xxxx | Top tool, female, type AB | 17 99 000 0029 |
| 17 23 xxx xxxx | Bottom tool, female, type C | 17 99 000 0047 | 17 35 xxx xxxx | Bottom tool, female, type AB | 17 99 000 0046 |

### Tools for angled shielded female connectors

| Part number connector | Tool identification | Part number tool | Part number connector | Tool identification | Part number tool |
|---|---|---|---|---|---|
| 17 21 xxx xxxx | Top tool, female, type A upper shield | 17 99 000 0030 | 17 34 xxx xxxx | Top tool, female, type AB upper shield | 17 99 000 0059 |
| 17 21 xxx xxxx | Top tool, female, type A divided shield computer telephony | 17 99 000 0031 | 17 35 xxx xxxx | Top tool, female, type AB upper shield | 17 99 000 0030 |
| 17 22 xxx xxxx | Top tool, female, type B upper shield | 17 99 000 0039 | 17 21 xxx xxxx | Press-in die lower shield type A | 17 99 000 0051 |
| 17 24 xxx xxxx | Top tool, female, type B upper shield | 17 99 000 0037 | 17 22 xxx xxxx | Press-in die lower shield type B | 17 99 000 0051 |
| 17 25 xxx xxxx | Top tool, female, type B upper shield | 17 99 000 0035 | 17 24 xxx xxxx | Press-in die lower shield type B | 17 99 000 0050 |
| 17 23 xxx xxxx | Top tool, female, type C upper shield | 17 99 000 0041 | 17 25 xxx xxxx | Press-in die lower shield type B | 17 99 000 0049 |
| 17 31 xxx xxxx | Top tool, female, type D upper shield | 17 99 000 0043 | 17 31 xxx xxxx | Press-in die lower shield type D | 17 99 000 0051 |
| 17 32 xxx xxxx | Top tool, female, type E upper shield | 17 99 000 0043 | 17 32 xxx xxxx | Press-in die lower shield type E | 17 99 000 0051 |
| 17 33 xxx xxxx | Top tool, female, type AB upper shield | 17 99 000 0033 | 17 33 xxx xxxx | Press-in die lower shield type AB | 17 99 000 0049 |
| | | | 17 34 xxx xxxx | Press-in die lower shield type AB | 17 99 000 0050 |
| | | | 17 35 xxx xxxx | Press-in die lower shield type AB | 17 99 000 0051 |



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## Tooling for backplanes – harbus® HM

For 6U backplanes with CompactPCI configuration, HARTING has developed this start-up tooling.

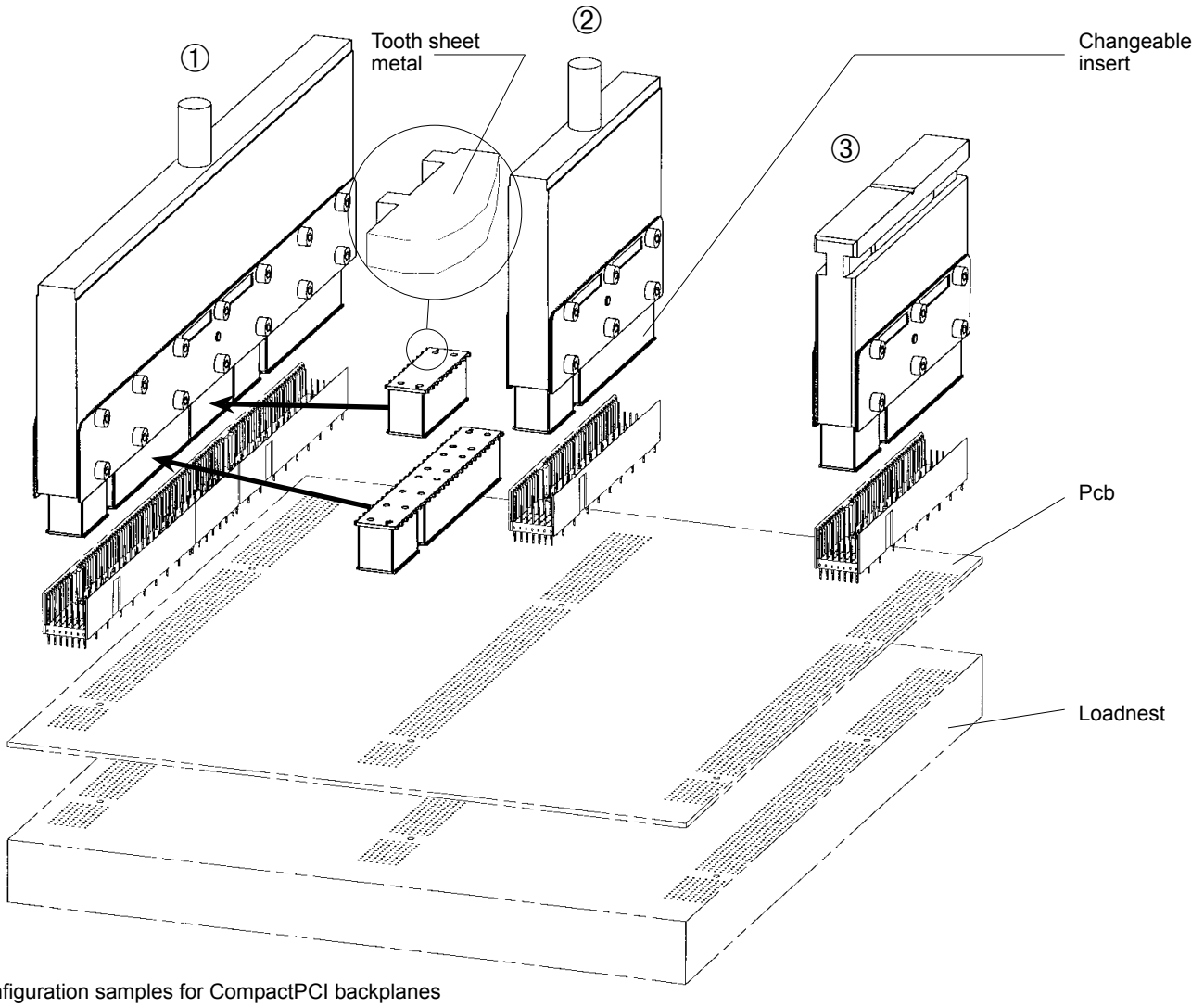
The basis is a top tool carrier with tooth inserts, that are engaged alternately.

Therefore this tooling assembly can be used without any additional set-up time.

The tooth inserts are interchangeable, so that the tooling can be used for other connector configurations as well as for CompactPCI.

The bottom tool should preferably be a loadnest, which carries and aligns the pcb.

For detailed information please contact your local HARTING representative.




Configuration samples for CompactPCI backplanes

### Tools for straight male connectors

| Tool identification | Part number tool | Tool identification | Part number tool |
|---|---|---|---|
| ① Insert top tool for 6U CompactPCI | 17 99 000 0063 | Tooth insert for type Monoblock 47 | 17 99 000 0066 |
| ② Insert top tool for 3U CompactPCI | 17 99 000 0065 | | |
| ③ Insert top tool for rotatable tool changer | on request | Tooth insert for type B 19 positions | 17 99 000 0068 |





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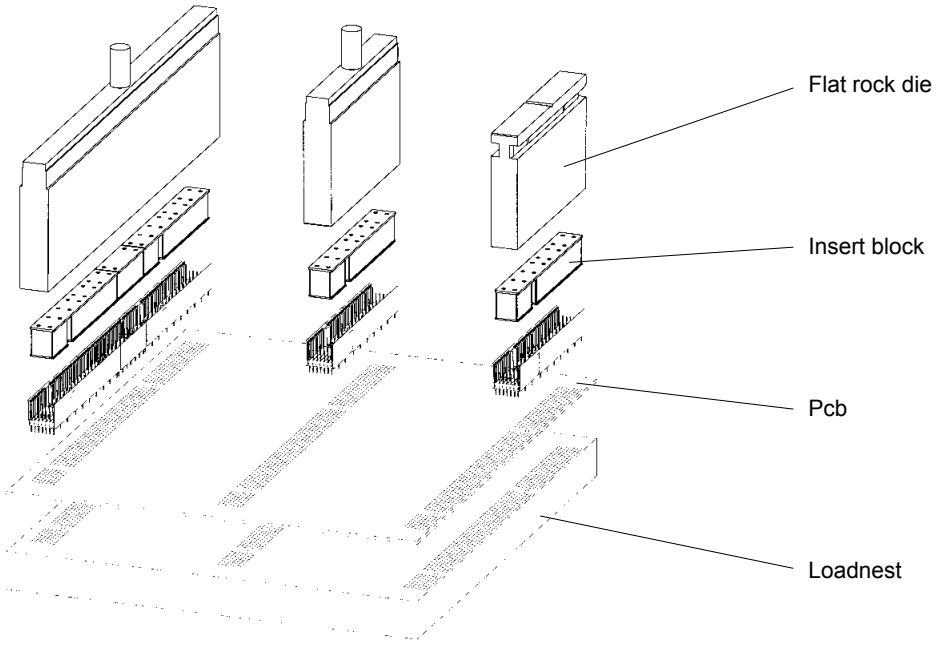
## Insert blocks for male connectors – harbus® HM

The insert blocks can be used to press-in harbus® HM male connectors without any special top tool. These blocks will be put into the connectors manually or automatically.

To press-in the connector no precise position is needed and can be done by a simple flat rock die. This will accelerate the cycle time of the press-in process dramatically.
Insert blocks are developed for use with a loadnest.




Application samples
for insert blocks

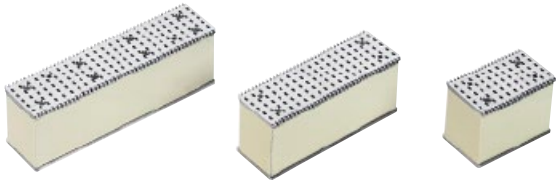
### Insert blocks for straight male connectors

| Part number connector | Tool identification | Quantity and part number tool |
|---|---|---|
| 17 01 xxx xxxx | Insert block for type A | 1 x 17 99 000 0009<br>or (2 x 17 99 000 0001) |
| 17 04 xxx xxxx | Insert block for type B | 1 x 17 99 000 0004 |
| 17 05 xxx xxxx | Insert block for type B | 1 x 17 99 000 0002 |
| 17 02 xxx xxxx | Insert block for type B | 1 x 17 99 000 0003 |
| 17 03 xxx xxxx | Insert block for type C | 1 x 17 99 000 0001 |
| 17 06 xxx xxxx | Insert block for type Monoblock 47 | 1 x 17 99 000 0008<br>or (1 x 17 99 000 0001 and 1 x 17 99 000 0005) |
| 17 11 xxx xxxx | Insert block for type D | 2 x 17 99 000 0006 |
| 17 12 xxx xxxx | Insert block for type E | 1 x 17 99 000 0007 |
| 17 13 xxx xxxx | Insert block for type AB | 1 x 17 99 000 0069 |
| 17 14 xxx xxxx | Insert block for type AB | 1 x 17 99 000 0070 |
| 17 15 xxx xxxx | Insert block for type AB | 1 x 17 99 000 0071 |
| 17 10 xxx xxxx | Insert block for type DE | 1 x 17 99 000 0072 |

### Flat rock dies

| Part number connector | Tool identification | Part number tool |
|---|---|---|
| 17 xx xxx xxxx | Flat rock die for 6U | 07 79 000 0155 |
| 17 xx xxx xxxx | Flat rock die for 3U | 07 79 000 0156 |

The insert block 17 99 000 0001 e.g. can be used for the types A, C and Monoblock 47.





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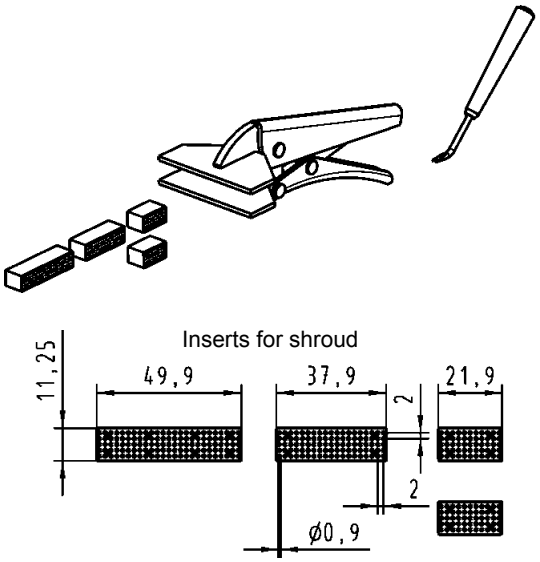
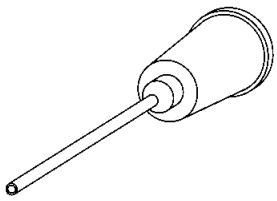
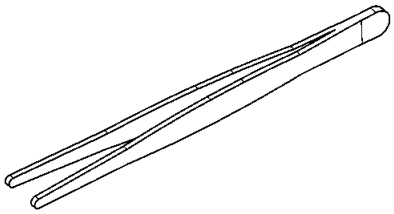
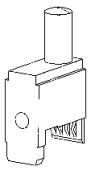
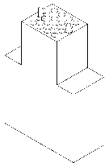
# Tools for press-in contacts

## Repair tooling – harbus® HM

| Identification | for use with | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Tool kit<br>shroud removal | harbus® HM | 17 99 000 0095 |  | |
| Insertion and repair tool<br>for single contact | harbus® HM | 17 99 000 0094 |  | |
| Removal tool<br>for single male contacts | harbus® HM | 09 99 000 0239 | | |
| Mounting tool<br>for coding key | harbus® HM | 17 99 000 0093 |  | |

## Tooling for angled male connectors – harbus® HM Power

| Identification | for use with | Part number | Drawing | Dimensions in mm |
|---|---|---|---|---|
| Top tool<br>for angled male connectors | harbus® HM<br>Power | 17 99 000 0102 |  | |
| Bottom tool<br>for angled male connectors | harbus® HM<br>Power | 17 99 000 0103 |  | |





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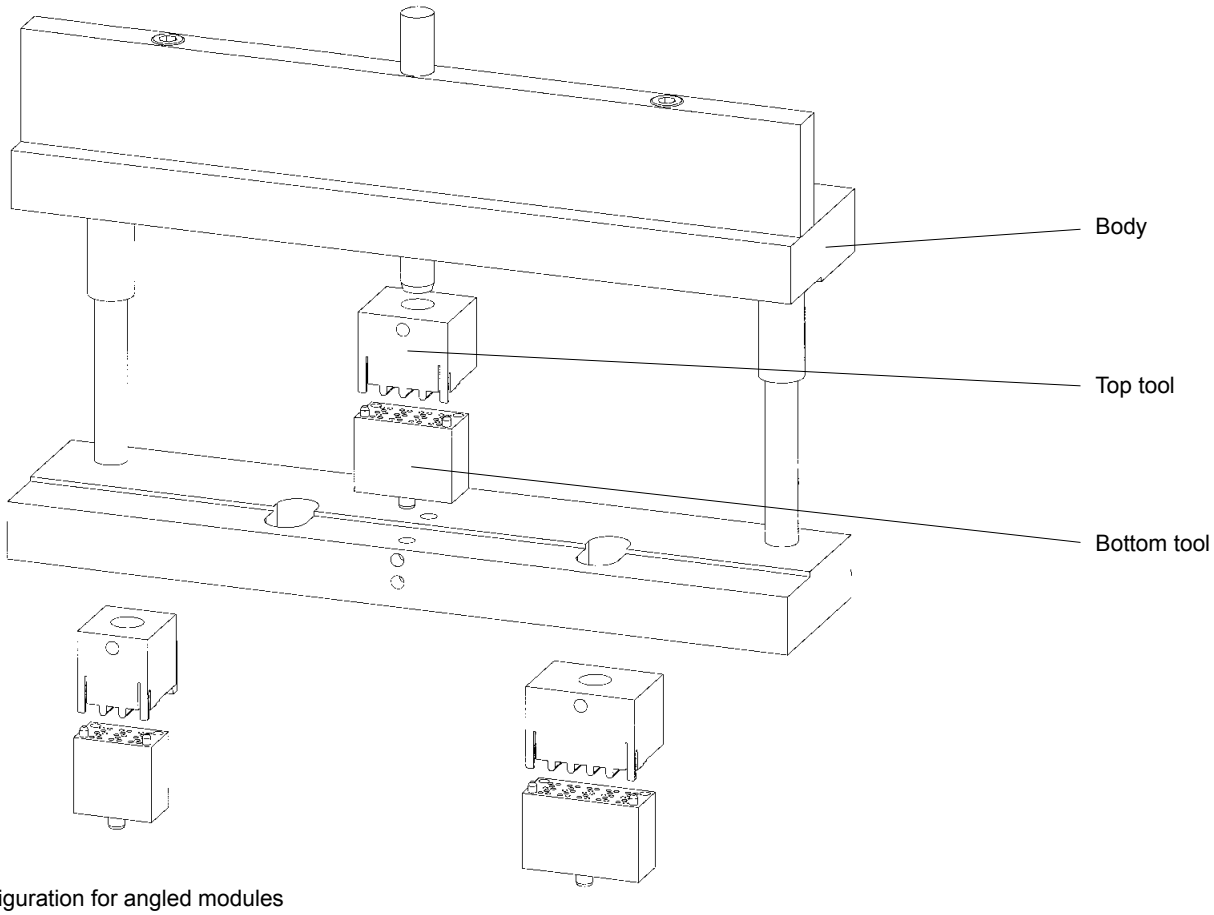
## Discrete tooling system – **Mini Coax**

Straight Mini Coax connectors can be pressed-in with a flat die and a top tool delivered with the connectors. This top tool can be used as contact protection and remains in the connector until the daughtercard is mated.

Angled Mini Coax connectors will be pressed-in with separate top and bottom tools, which will be mounted into a common body.




Configuration for angled modules

### Tools for straight modules

| Part number connector | Tool identification | Part number tool |
|---|---|---|
| 07 11 xxx xxxx | 1 SU Mini Coax Standard bottom tool | on request |
| 07 11 xxx xxxx | 1.25 SU Mini Coax Standard bottom tool | on request |
| 07 11 xxx xxxx | 1.50 SU Mini Coax Standard bottom tool | on request |

### Tools for angled modules

| Part number connector | Tool identification | Part number tool |
|---|---|---|
| 07 31 xxx xxxx | Body | 07 79 000 0061 |
| 07 31 xxx xxxx | 1 SU Mini Coax Standard bottom tool | 07 79 000 0045 |
| 07 31 xxx xxxx | 1 SU Mini Coax Standard top tool | 07 79 000 0080 |
| 07 31 xxx xxxx | 1.25 SU Mini Coax Standard bottom tool | 07 79 000 0034 |
| 07 31 xxx xxxx | 1.25 SU Mini Coax Standard top tool | 07 79 000 0081 |
| 07 31 xxx xxxx | 1.50 SU Mini Coax Standard bottom tool | 07 79 000 0171 |
| 07 31 xxx xxxx | 1.50 SU Mini Coax Standard top tool | 07 79 000 0170 |
| 07 31 xxx xxxx | 1 SU Mini Coax single-row bottom tool | 07 79 000 0205 |
| 07 31 xxx xxxx | 1 SU Mini Coax single-row top tool | 07 79 000 0204 |



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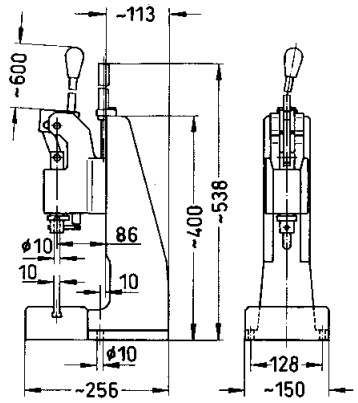
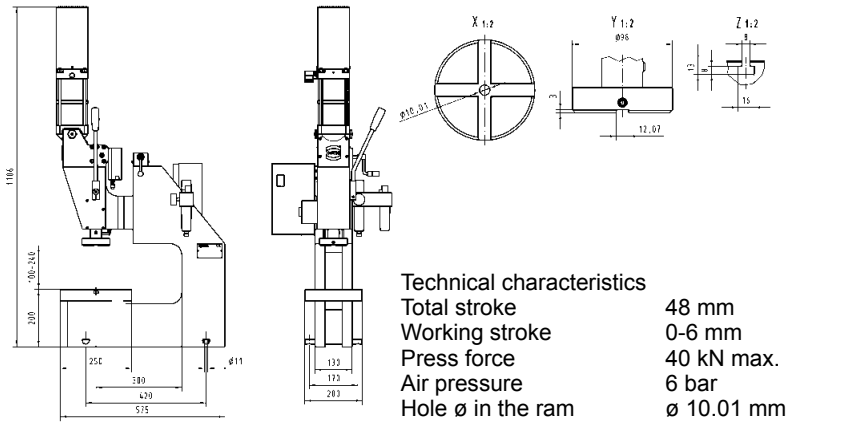
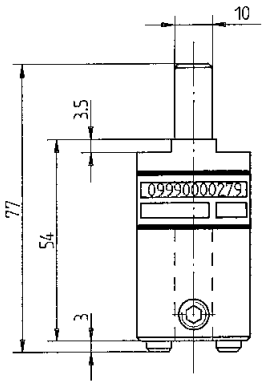
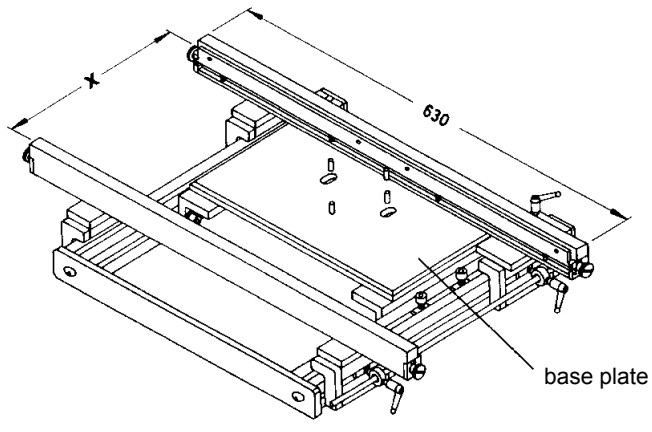
## Hand bench presses / pneumatic presses

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| Hand bench press | 09 99 000 0201 |  | Technical characteristics<br>Working stroke 25 mm<br>Press force 15 kN max.<br>Hole ø in the ram ø 10 mm<br>Net weight approx. 23 kg |
| Pneumatic press<br>**40 kN** | 09 99 000 0282 |  | Technical characteristics<br>Total stroke 48 mm<br>Working stroke 0-6 mm<br>Press force 40 kN max.<br>Air pressure 6 bar<br>Hole ø in the ram ø 10.01 mm<br>Net weight 136 kg<br>Power supply 110 V / 220 V AC |
| Adaptor for height compensation[1)] | 09 99 000 0279 |  | |
| Guide frame with base plate<br>Standard type for pcb size x = 123,5 - 309,5 mm<br>Long type[2)] for pcb size x = 123,5 - 668,5 mm<br>Base plate | 09 99 000 0244<br>09 99 000 0261<br>09 99 000 0255 |  | |

[1)] suitable for 09 99 000 0282 and all CPM machines
[2)] not suitable for hand bench press





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## CPM press-in machines

| | |
|---|---|
| **Part number** | **09 89 040 0000** |

Technical characteristics

| | |
|---|---|
| Drive | electro-mechanical, servo |
| Press-in force | 100 kN |
| max. pcb dimensions | 600 x 1000 mm |
| Floor space | 1200 x 1150 mm |
| Weight | 980 kg |
| Power supply | 3x 208 / 380 / 400 / 415 V |
| Consumption | < 1 kW |
| Colour | on request |

**CPM *prestige***
(incl. PC, control software, barcode reader, keyboard, touch screen)

Built-in features:

- Guiding rails (carbon/spring-loaded) for the secure positioning of the pcb
- Touch-screen and Industrial PC with UPS (uninterruptable power supply)
- Barcode reader for management ease of press-in programs
- All dimensions allow an easy integration into production lines

Process monitoring and quality assurance:

- Touch screen interface with graphical and verbal menus for all machine functions
- Autosense: automated press-in interruption at incorrect press-in forces
- Storage and validation of all press-in parameters via quality assurance software (press-in force tolerances)
- Continuous high-precision measurement and recording of press-in forces and distances
- Remote determination of errors and maintenance
- High flexibility through a modular tool range

Options:

- Rotatable tool changer
- Insertion removal station

**Insertion removal station**

| | |
|---|---|
| Power supply | 220 V / 50 Hz |
| Air pressure | 6 bar (15-16 l/min.) |
| **Part number** | **on request** for pcb dimensions of max. 710 mm x 540 mm |

Bestseller **CPM *prestige* with insertion removal station**, adaptable to all HARTING press-in machines.



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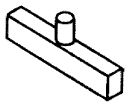
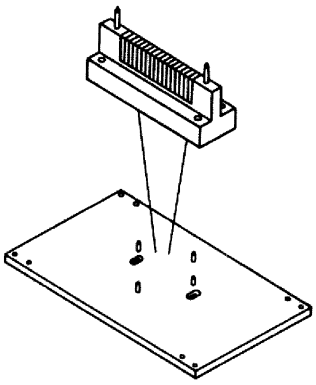
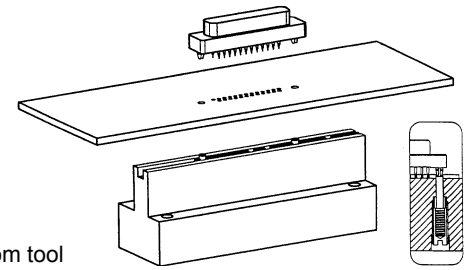
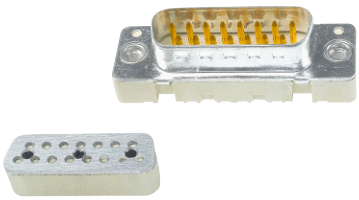
## Tools – SEK, D-Sub

| Identification | Part number | |
|---|---|---|
| **Top tool**<br>for SEK | 09 99 000 0197 |  Top tool |
| **Bottom tool**<br>universal, for SEK<br>narrow, for SEK | 09 99 000 0185<br>09 99 000 0256 |  Bottom tool |
| **Base plate**<br>for SEK, D-Sub | 09 99 000 0255 | Base plate |
| **Bottom tool**<br>narrow for D-Sub<br>Only one tool for all polarities, with or without grounding pins<br>9-37 way<br>50 way | <br><br><br>09 99 000 0600<br>09 99 000 0523 |  Bottom tool |
| **Plastic with metal plate insert tool**<br>for D-Sub male<br>9 way<br>15 way<br>25 way | <br><br>09 99 600 0709<br>09 99 600 0715<br>09 99 600 0725 |  |
| Other toolings on request | | |





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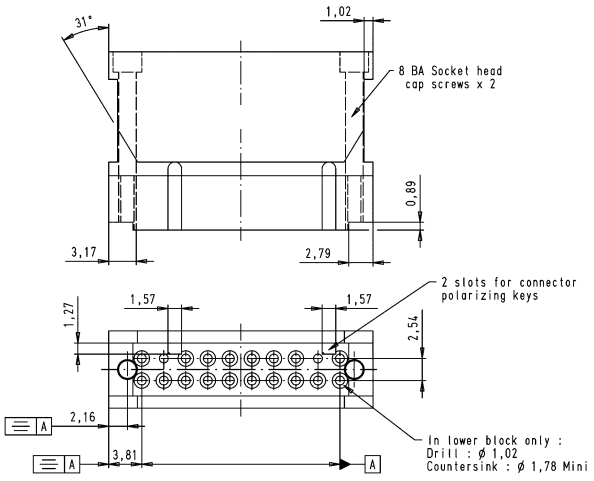
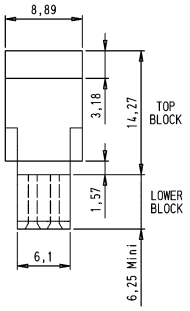
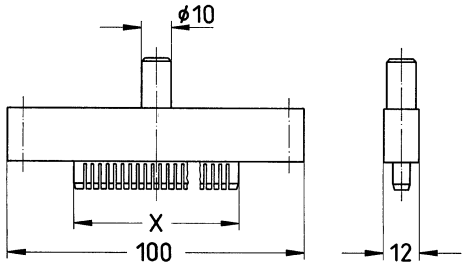
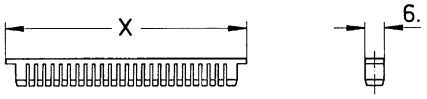
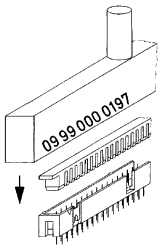
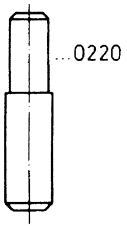
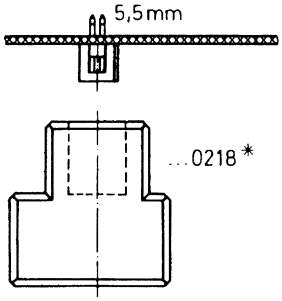
## Tools – SEK, D-Sub

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Top tool**<br>for SEK standard connectors | |  |  |
| 10 way | 09 99 000 0710 | | |
| 14 way | 09 99 000 0714 | | |
| 16 way | 09 99 000 0716 | | |
| 20 way | 09 99 000 0720 | | |
| 26 way | 09 99 000 0726 | | |
| 34 way | 09 99 000 0734 | | |
| 40 way | 09 99 000 0740 | | |
| 50 way | 09 99 000 0750 | | |
| 60 way | 09 99 000 0760 | | |
| 64 way | 09 99 000 0764 | X Length depends on number of contacts | |
| **Top tool**<br>for SEK male low-profile connectors | | **Top tool including insert**<br>  | |
| 6 way | 09 99 000 0 ⌴ 06 | | |
| 10 way | 09 99 000 0 ⌴ 10 | | |
| 14 way | 09 99 000 0 ⌴ 14 | | |
| 16 way | 09 99 000 0 ⌴ 16 | | |
| 20 way | 09 99 000 0 ⌴ 20 | | |
| 26 way | 09 99 000 0 ⌴ 26 | | |
| 34 way | 09 99 000 0 ⌴ 34 | | |
| 40 way | 09 99 000 0 ⌴ 40 | | |
| 50 way | 09 99 000 0 ⌴ 50 | | |
| 60 way | 09 99 000 0 ⌴ 60 | | |
| 64 way | 09 99 000 0 ⌴ 64 | X Length depends on number of contacts | |
| Top tool including insert ➤ 4<br>Modular insert ➤ 5 | | **Modular insert**<br>  |  |
| **Press-out tool**<br>for complete SEK male connectors with 5.5 mm terminations | 09 99 000 0220 |  | |
| **Support block** | 09 99 000 0218 |  | |

* Further versions on request

Tooling



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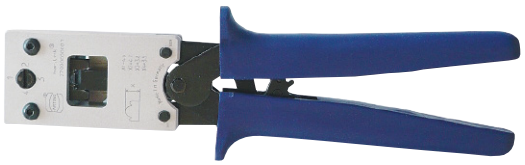
## Tools for insulation displacement termination – har-link

| Identification | Part number | |
|---|---|---|
| Crimping hand tool<br>for shell cable entry | 27 99 000 0001 |  |



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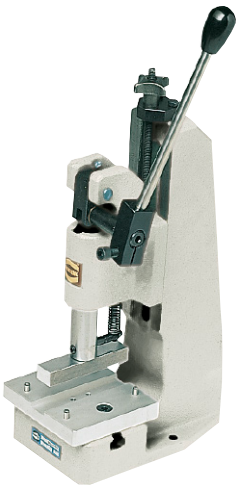
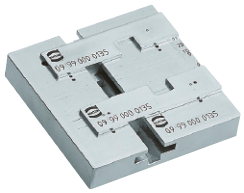
## Tools for insulation displacement termination – D-Sub, SEK

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Bench press**<br>for termination of insulation displacement connectors<br>suitable for D-Sub, SEK | 09 99 000 0114 |  | |
| **Cabling tool**<br>for termination of flat cables<br>suitable for D-Sub | 09 99 000 0135 |  | |
| SEK female | 09 99 000 0115 | | |
| SEK DIP | 09 99 000 0134 | | |
| SEK LP, 2 rows | 09 99 000 0131 | | |
| SEK LP, 4 rows | 09 99 000 0130 | | |
| DIN 41612 | 09 99 000 0150 | | |
| **Insert**<br>for termination of 37-pole male D-Sub connectors | 09 99 600 0201 | | |
| **Hand tool with base plates (included in tool kit)**<br>for termination of insulation displacement connectors<br>suitable for D-Sub, SEK | 09 99 000 0149 | | |
| **Cable cutter**<br>for flat cables<br>suitable for D-Sub, SEK | 09 99 000 0116 | | |
| **Spare parts** | | | |
| Blade | 09 99 000 0179 | | |
| Cutting plate | 09 99 000 0180 | | |



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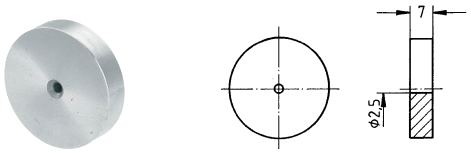
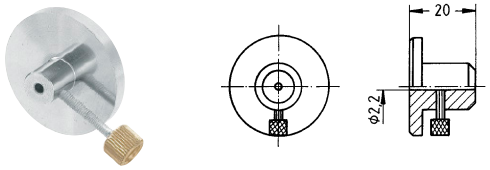
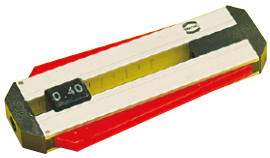
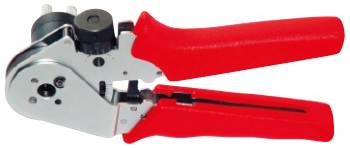
## Tools for **FOC contacts**

| Identification | Part number | Drawing | Dimensions in mm |
|---|---|---|---|
| **Polishing tool** | | | |
| DIN 41 626 | **20 99 000 1092** |   | |
| POF[1] cable Ø 2.2 | **20 99 000 1093** |   | |
| **Fibre stripper** | | | |
| | 20 99 000 1041<br>**20 99 000 1045**<br>**20 99 000 1046** | 0.3 mm<br>1 mm<br>0.18/0.3 mm |  |
| **Crimping tool**<br>for 1 mm POF contacts<br>– Han D®, Han E®<br>– DIN 41 626<br>– Ferrule<br>– F-SMA, -ST | **20 99 000 1035** | |  |
| **HARTING Crimping tool**<br>for FO connector<br>(glass fibre)<br>SW 4.3 mm<br>3.8 mm<br>4.95 mm | 20 99 000 1031 | | |
| **HARTING Crimping tool**<br>for FO connector<br>(plastic fibre)<br>SW 6.95, 4.95 and 3.0 mm | **20 99 000 1033** | for crimping the strain relief to the connector<br>… 1031 FO cable for glass fibre<br>… 1033 POF[1] and SERCOS cable Ø 6.0 and 3.6 | |
| **Epoxy adhesive**<br>glass fibre | 20 80 001 9902 | 2 ml EPO-TEK 360 with hardener (10:1), 4 g foil pack | |
| **Polishing paper**<br>for POF[1]-grain size 1000<br>for GI 9 µ-grain size<br>for GI 1 µ-grain size | 20 80 001 9911<br>20 80 001 9912<br>20 80 001 9913 | Delivery range:<br>Each part number ordered comprises 2 pieces | |

[1] POF = Polymer optical fibre

**Stock items in bold type**



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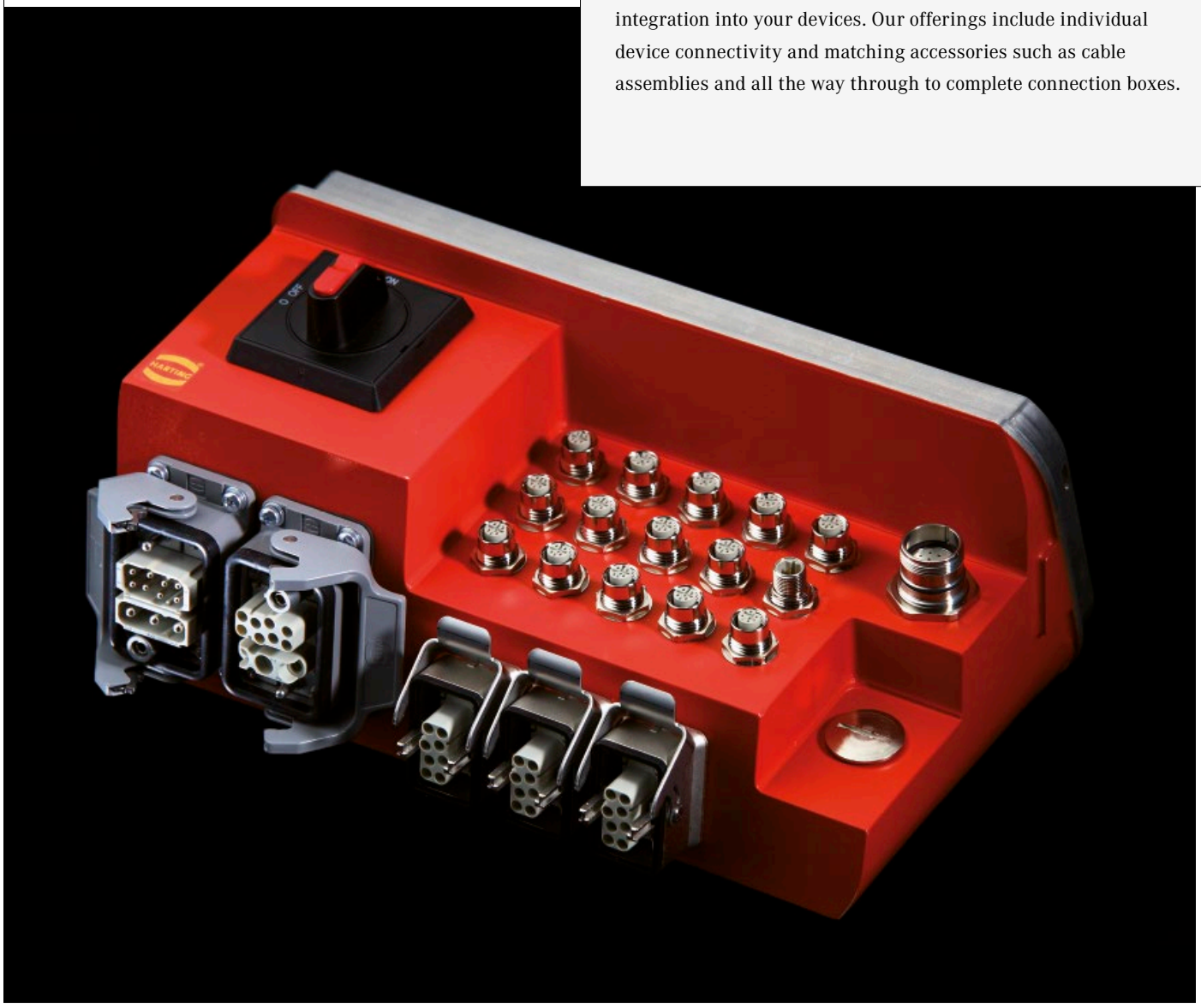
# 31. Custom Device Connectivity

Individual device connectivity tailored to device versatility.
When customized products are called for, you can always rely on HARTING.
HARTING offers a wide range of series products for data, signal and power. Most tasks are covered by a convincing solution from the standard range of board-to-board, cable-to-board or wire-to-board connectivity offered. In many instances, however, specific tasks call for the development of a connectivity solution that is tailored and attuned to specific devices. Requests range from color choices and labeling to stand-alone customer specific solutions.

We implement the connection technology and its customized integration into your devices. Our offerings include individual device connectivity and matching accessories such as cable assemblies and all the way through to complete connection boxes.



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# 31. Custom Device Connectivity

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| From ideas to the Best Customer Solution | **31.02** |
| Production as competitive factor | **31.04** |
| Solution spectrum | **31.06** |






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# From ideas to the Best Customer Solution

## CUSTOMER REQUIREMENTS

Highly qualified sales engineers record your requirements, and devise and explain initial solution approaches

## DESIGN AND DEVELOPMENT

In close coordination with customers, the inventive engineers at the HARTING Technology Group develop the Best Customer Solution

## PRESENTATION OF SOLUTION PROPOSALS

Presentation and discussion of the developed Device Connectivity concept

## PRODUCTION

Manufacturing of products to exacting quality standards

## DELIVERY

On-time delivery according to your delivery and packaging instructions

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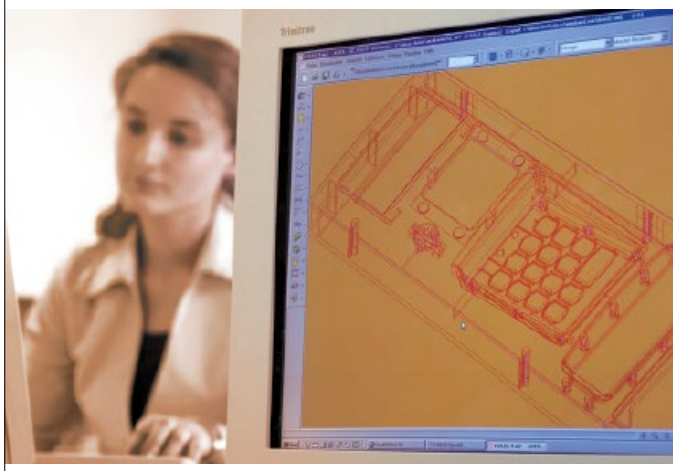

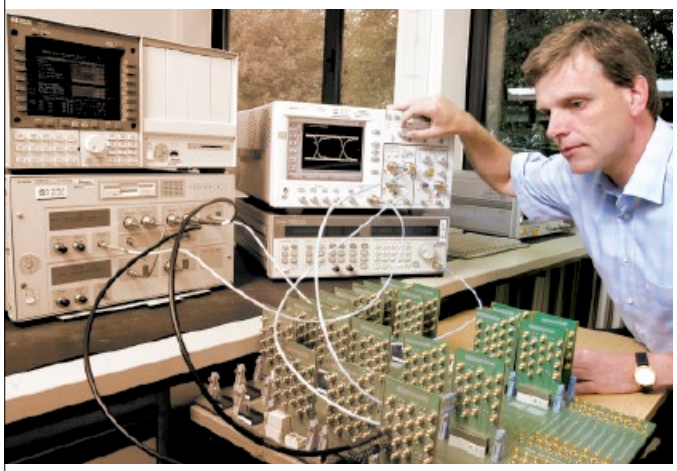

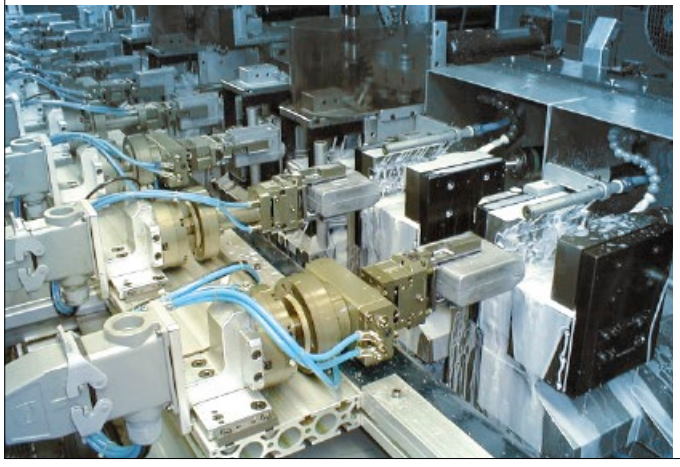

## FROM IDEAS TO THE BEST CUSTOMER SOLUTION

In cooperation with your product managers and development engineers, HARTING will generate the ideal connectivity solutions for your devices.

Project management encompasses all activities required for the reliable, cost-effective and on-time handling and execution.

An initial concept is created with the help of advanced, leading edge CAD technologies and inspected in terms of feasibility in specially equipped test workshops as well as by the accredited HARTING laboratory.

In order to attune solutions to production requirements, the tool construction, production and quality management departments contribute their expertise right from the outset.



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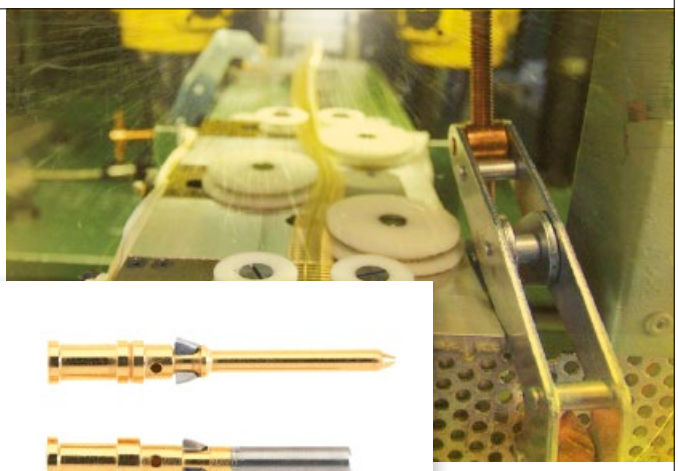
## PRODUCTION OF DEVICE CONNECTIVITY:

Our products are backed by an additional, decisive competitive factor - namely the production process. HARTING production performance represents a consequent supplement to innovative product development. Divided according to technology areas, and operating with a high vertical range of manufacture, our state of the art production locations are based in Germany, England, Romania, USA and China. At HARTING, the entire range, from smallest production batches to large-scale automated production, is subject to consistent QC management.

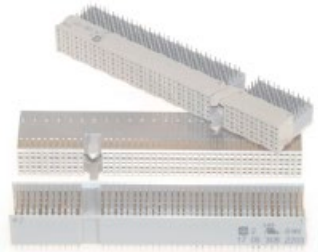


## PUNCHED AND LATHED COMPONENTS:

Punching and lathing represent basic technologies used to produce contacts. Customer requirements such as special contact materials and dimensions can be implemented directly through our own production processes.

## INJECTION MOLDING:

Isolators of connectors and plastic housing are produced in an injection molding process. HARTING excels in the production of filigree isolators and the production of miniature precision parts.
We develop, construct and produce micro precision injection molding tools along the limits of feasibility.



## ALUMINUM DIE-CASTING:

HARTING produces its Han® housings in an aluminum die-casting process. This technology forms the basis for robust metal housings for a wide range of different applications.

## OVERMOLDING AND ENCAPSULATING TECHNOLOGY:

HARTING offers overmolded cables and connectors for cable-to-board connectivity with degree of protection IP65 / IP67. Corresponding tools and production equipment for overmolding and encapsulating technologies are available at all our production locations.

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### CABLE ASSEMBLY:

The cable assembly area produces cabling solutions with standard, hybrid or special cables.
We produce bus cables for Ethernet, Fieldbus systems as well as for special communication protocols.
We also assemble FOC cables on the basis of plastic, glass (monomode, gradient and grade index) or HCS fibers.

### PCB PRODUCTION:

We support innovative device configurations with PCB modules as connectivity interfaces. The offerings include solutions ranging from simple PCB adapters through to complex multilayer backplanes.
Based on the Global Footprint principle, HARTING is able to provide the same production expertise at our companies in the USA, in England and in China.

### PRODUCTION OF COMPLETE MODULES:

Our range of Device Connectivity offerings also covers the development and assembly of complete custom connection modules, with IP20 or IP65 / IP67 modules for data, signal and power applications tailored to suit the requirements of your specific devices. These connection modules combine our in-depth expertise and competencies in connection, PCB and housing technologies.





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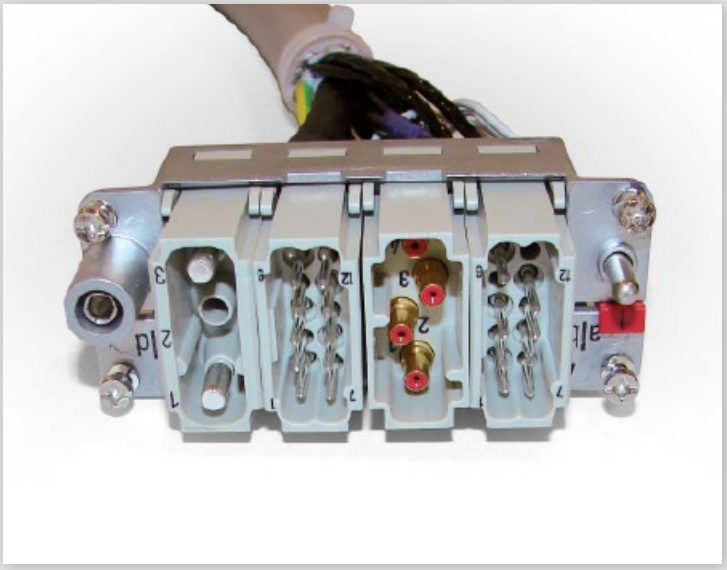
## TAILORED PRODUCTS:

HARTING provides a convincing answer to each and every connectivity requirement – whether board-to-board, cable-to-board or wire-to-board applications. Our customers benefit from our capability of providing tailored solutions for all applications.

Customized connector concept



Ready-to-use pre-assembled connector with system cable



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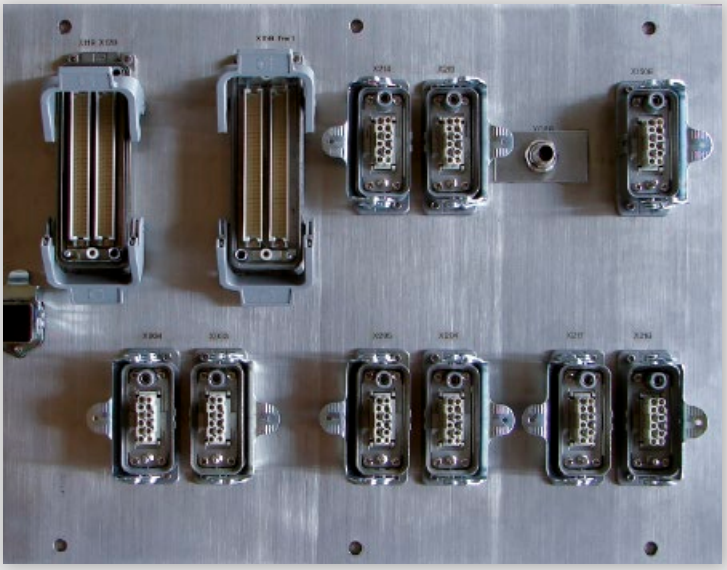
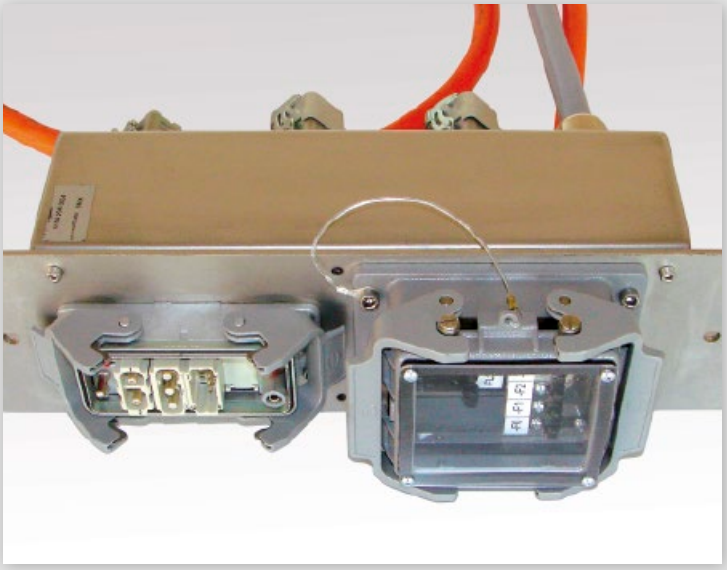
Connectivity module for installation in equipment or control cabinets



Decentralized electronic module

Decentralized electronic module with high degree of protection (IP65 / IP67)







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# Notes



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| Termination technologies | **40.06** |
| IP protection levels | **40.16** |




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## General

The choice of device termination technology and connectors entails more than just considering factors such as functionality, the number of contacts, current and voltage ratings. It is equally important to take account of where the connectors are to be used and the prevailing ambient conditions. This in turn means that, dependent on the conditions under which they are to be installed and pursuant to the relevant standards, different voltage and current ratings may apply for the same connectors.

The most important influencing factors and the corresponding electrical characteristics of the associated connectors are illustrated here in greater detail.

## Overvoltage category

The overvoltage category is dependent on the mains voltage and the location at which the equipment is installed. It describes the maximum overvoltage resistance of a device in the event of a power supply system fault, e. g. in the event of a lightening strike.

The overvoltage category affects the dimensioning of components in that it determines the clearance air gap. Pursuant to the relevant standards, there are 4 overvoltage categories.

## Extract from IEC 60 664-1, Para. 2.2.2.1.1

*Equipment of **overvoltage category I** is equipment for connection to circuits in which measures are taken to limit transient overvoltages to an appropriately low level.*

*Note: Examples are protected electronic circuits.*

*Equipment of **overvoltage category II** is energy-consuming equipment to be supplied from the fixed installation.*

*Note: Examples of such equipment are appliances, portable tools and other household equipment with similar loads.*

*If such equipment is subjected to special requirements with regard to reliabiliy and availability, overvoltage category III applies.*

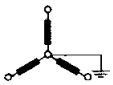
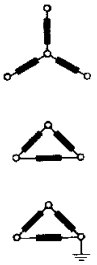
***Equipment of overvoltage category III is equipment in fixed installations and for cases where the reliability and the availability of the equipment is subject to special requirements.***

***Note: Examples of such equipment are switches in the fixed installation and equipment for industrial use with permanent connection to the fixed installation.***

*Equipment of **overvoltage category IV** is for use at the origin of the installation.*

*Note: Examples of such equipment are electricity meters and primary overcurrent protection equipment.*

## Rated impulse voltages (Table 5 of DIN EN 61 984)

| Nominal voltage of the supply system (= rated insulation voltage of equipment) | | | | | Preferred values for the rated impulse voltage kV (1.2/50 µs) | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Overvoltage category | | | |
| | | | | | I | II | III | IV |
| Voltage line to earth derived from the nominal voltage of the supply system to the a. c. voltage (r. m. s. value) or d. c. voltage | AC voltage (r. m. s. value)  | AC voltage (r. m. s. value)  | AC voltage (r. m. s. value, d. c. voltage)  | AC voltage (r. m. s. value, d. c. voltage) | Special protected levels | Level for electrical equipment (household and others) | Level for distribution supply systems | Input level |
| V | V | V | V | V | | | | |
| 100 | 66/115 | 66 | 60 | – | 0.5 | 0.8 | 1.5 | 2.5 |
| 150 | 120/208; 127/220 | 115; 120; 127 | 110; 120 | 220-110; 240-120 | 0.8 | 1.5 | 2.5 | 4 |
| 300 | 220/380; 230/400; 240/415; 260/440; 277/480 | 220; 230; 240; 260; 277 | 220 | 440-220 | 1.5 | 2.5 | 4 | 6 |
| 600 | 347/600; 380/660; 400/690; 415/720; 480/830 | 347; 380; 400; 415; 440; 480; 500; 577; 600 | 480 | 960-480 | 2.5 | 4 | 6 | 8 |
| 1000 | | 660; 690; 720; 830; 1000 | 1000 | – | 4 | 6 | 8 | 12 |



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## Pollution degree

The dimensioning of operating equipment is dependent on environmental conditions. Any pollution or contamination may give rise to conductivity that, in combination with moisture, may affect the insulating properties of the surface on which it is deposited. The pollution degree influences the design of components in terms of the creepage distance.

The pollution degree is defined for exposed, unprotected insulation on the basis of environmental conditions.

**HARTING products for the device termination (connectors) are designed as standard for Pollution Degree 3.**

**Pollution degree 1**
in air-conditioned or clean, dry rooms, such as computer and measuring instrument rooms, for example.

**Pollution degree 2**
in residential, sales and other business premises, precision engineering workshops, laboratories, testing bays, rooms used for medical purposes. As a result of occasional moisture condensation, it is to be anticipated that pollution/contamination may be temporarily conductive.

**Pollution degree 3**
**in industrial, commercial and agricultural premises, unheated storage premises, workshops or boiler rooms, also for the electrical components of assembly or mounting equipment and machine tools.**

**Pollution degree 4**
in outdoor or exterior areas such as equipment mounted on the roofs of locomotives or tramcars.

## Extract from IEC 60 664-1, Para. 2.5.1

***Pollution degree 1:*** *No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.*

***Pollution degree 2:*** *Only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is to be excepted.*

***Pollution degree 3: Conductive pollution occurs or dry non-conductive pollution occurs which becomes conductive due to condensation which is to be excepted.***

***Pollution degree 4:*** *The pollution generates persistent conductivity caused by conductive dust or by rain or snow.*

## Special ruling for connectors

**Subject to compliance with certain preconditions, the standard for device termination connectors permits a lower pollution degree than that which applies to the installation as a whole. This means that in a pollution degree 3 environment, connectors may be used which are electrically rated for pollution degree 2. The basis for this is contained in DIN EN 61 984, Para. 6.19.2.2.**

## Extract form DIN EN 61 984, Para. 6.19.2.2

*For a connector with a degree of protection IP54 or higher according to IEC 60 529 the insulating parts inside the enclosure may be dimensioned for a lower pollution degree.*

*This also applies to mated connectors where enclosure is ensured by the connector housing and which may only be disengaged for test and maintenance purposes.*

## The conditions fulfills,

- a connector which is protected to at least IP54 as per IEC 60 529,
- a connector which is installed in a housing and which as described in the standard is disconnected for testing and maintenance purposes only,
- a connector which is installed in a housing and which when disconnected is protected by a cap or cover to at least IP54,
- a connector located inside a switching cabinet to at least IP54.

These conditions do not extend to connectors which when disconnected remain exposed to the industrial atmosphere for an indefinite period.

It should be noted that pollution can affect a connector from the inside of an installation outwards.

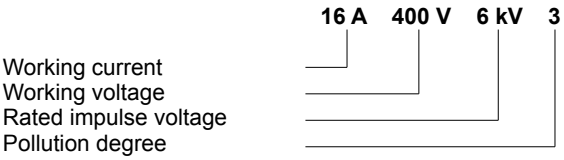
## Typical applications in which to choose pollution degree 2 connectors:

- A connector serving a drive motor which is disconnected only for the purpose of replacing a defective motor, even when the plant or system otherwise calls for pollution degree 3.
- Connectors serving a machine of modular design which are disconnected for transport purposes only and enable rapid erection and reliable commissioning. In transit, protective covers or adequate packing must be provided to ensure that the connectors are not affected by pollution/contamination.
- Connectors located inside a switching cabinet to IP54. In such cases, it is even possible to dispense with the IP54 housings of the connectors themselves.

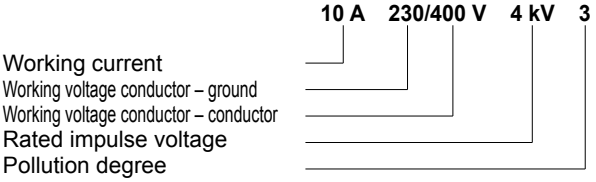
## Specifying electrical data

Electrical data for connectors are specified as per DIN EN 61 984.

This example identifies a connector suitable for use in an unearthed power system or earthed delta circuit (see page 40.02, Table 5 of DIN EN 61 984):




This example identifies a connector suitable exclusively for use in earthed power systems (see page 40.02, Table 5 of DIN EN 61 984):



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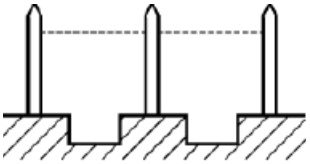
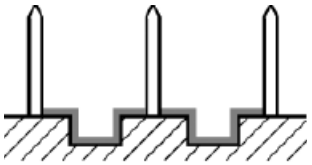
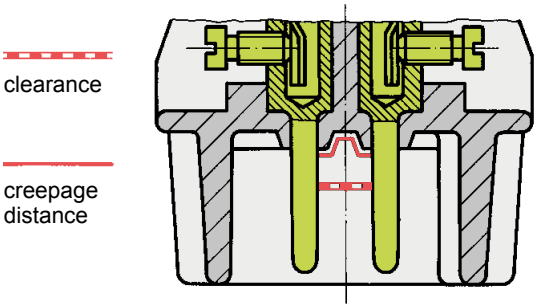
## Other terms explained

**Clearance air gap**
The shortest distance through the air between two conductive elements (see IEC 60664-1, Para. 1.3.3). The air gaps are determined by the surge voltage withstand level.



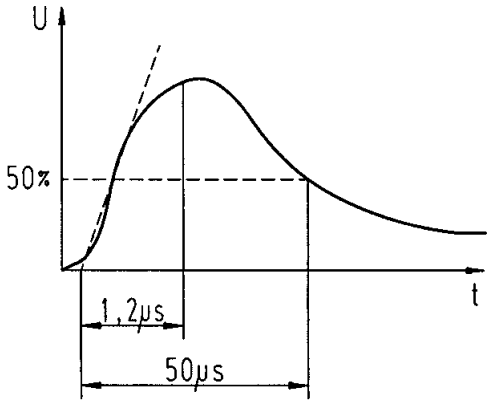

**Creepage distance**
Shortest distance on the surface of an insulating material between two conductive elements (see IEC 60664-1, Para. 1.3.3). The creepage distances are dependent on the rated voltage, the pollution degree and the characteristics of the insulating material.




**Working voltage**
Fixed voltage value on which operating and performance data are based. More than one value for rated voltage or rated voltage range may be specified for the same connector.

**Rated impulse voltage**
The rated impulse voltage is determined on the basis of the overvoltage category and the nominal power supply voltage. This level in turn directly determines the test voltage for testing the overvoltage resistance of the connector *(Waveform voltage in 1.2/50 µs as per IEC 60060-1)*.




**Working current**
Fixed current, preferably at an ambient temperature of 40 °C, which the connector can carry on a permanent basis (without interruption), passing simultaneously through all contacts which are in turn connected to the largest possible conductors, without exceeding the upper temperature limit.
The dependence of the rated current on ambient temperature is illustrated in the respective derating diagrams.

**Transient overvoltages**
Short-term overvoltage lasting a few milliseconds or less, oscillatory or non-oscillatory, generally heavily damped (see IEC 60664-1, Para. 1.3.7.2). An overvoltage may occur as a result of switching activities, a defect or lightening surge, or may be intentionally created as a necessary function of the equipment or component.

**Power-frequency withstand voltage**
A power-frequency overvoltage (50/60 Hz).
Applied for a duration of one minute when testing dielectric strength.
For test voltages in association with surge voltage withstand levels, see extract from Table 8, DIN EN 61984.

**Test voltages** (Extract from Table 8, DIN EN 61984)

| Impulse withstand voltage kV (1.2/50 µs) | RMS withstand voltage kV (50/60 Hz) |
|---|---|
| 0.5 | 0.37 |
| 0.8 | 0.50 |
| 1.5 | 0.84 |
| 2.5 | 1.39 |
| 4 | 2.21 |
| 6 | 3.31 |
| 8 | 4.26 |
| 12 | 6.6 |

**CTI (Comparative Tracking Index)**
This figure gives an indication of the conductivity of insulating materials and affects the specified creepage distances. The influence of the CTI value on the creepage distance is as follows: the higher the index value, the shorter the creepage distance. The CTI is used to divide plastics into insulation groups.

Breakdown of insulation groups:

| | |
|---|---|
| I | 600 ≤ CTI |
| II | 400 ≤ CTI < 600 |
| IIIa | 175 ≤ CTI < 400 |
| IIIb | 100 ≤ CTI < 175 |

**Protection levels as per IEC 60529**
The protection level describes the leak-proof character of housing, e. g. for electrical equipment. It ranges from IP00 to IP68. HARTING heavy duty Han connectors feature a standard protection level of IP65 (see page 40.16, table based on DIN VDE 0470, DIN EN 60529, IEC 60529).

**Derating diagram as per DIN IEC 60512**
These diagrams are used to illustrate the maximum current carrying capacity of components. The illustration follows a curve which shows the current in relation to ambient temperature. Current carrying capacity is limited by the thermal characteristics of contacts and insulating elements which have an upper temperature limit which should not be exceeded.



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## Current carrying capacity

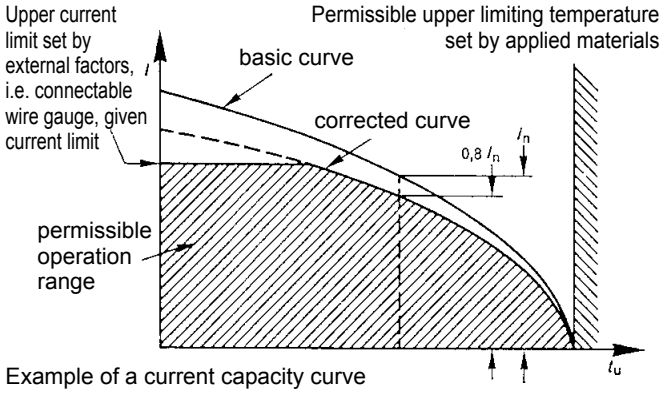
The current carrying capacity is determined in tests which are conducted on the basis of the DIN IEC 60 512 part 5. The current carrying capacity is limited by the thermal properties of materials which are used for inserts as well as by the insulating materials. These components have a limiting temperature which should not be exceeded.

The relationship between the current, the temperature rise (loss at the contact resistance) and the ambient temperature of the connector is represented by a curve. On a linear co-ordinate system the current lies on the vertical line (ordinate) and the ambient temperature on the horizontal line (abscissa) which ends at the upper limiting temperature.

In another measurement the self-heating (Δt) at different currents is determined.

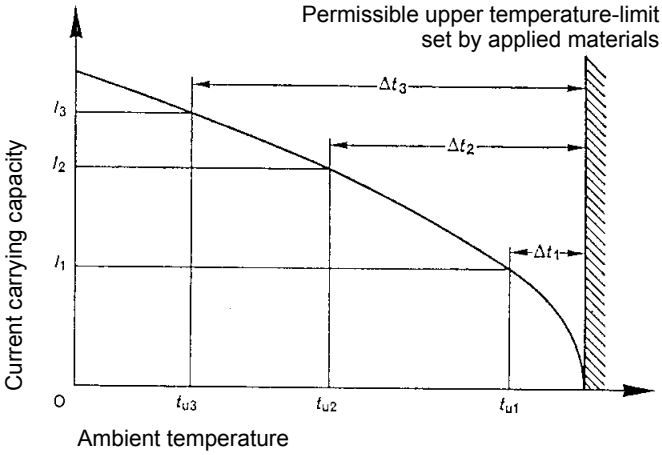
At least 3 points are determined which are connected to a parabolic curve, the basic curve.

The corrected current carrying capacity curve is derived from this basic curve. The reasons for the correction are external factors that bring an additional limitation to the current carrying capacity, i.e. connectable wire gauge or an unequal dispersion of current.




Example of a current capacity curve

Definition: The rated current is the continuous, not interrupted current a connector can take when simultaneous power on all contacts is given, without exceeding the maximum temperature.




Example of a current carrying curve

Acc. to IEC 61 984 the sum of ambient temperature and the temperature rise of a connector shall not exceed the upper limiting temperature. The limiting temperature is valid for a complete connector, that means insert plus housing.

As a result the insert gives the limit for the temperature of a complete connector and thus housings as well.

In practice it is not usual to load all terminals simultaneously with the maximum current. In such a case one contact can be loaded with a higher current as permitted by the current capacity curve, if less than 20 % of the whole is loaded.

However, for these cases there are no universal rules. The limits have to be determined individually from case to case. It is recommended to proceed in accordance with the relevant rules of the DIN IEC 60 512 part 5.

## Current carrying capacity of copper wires

| Diameter [mm²] of single wires in a three-phase system | | 0.75 | 1 | 1.5 | 2.5 | 4 | 6 | 10 | 16 | 25 | 35 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of installation | | | | | | | | | | | |
| B1 | Wires in protective tubes and installation conduits | 7.6 | 10.4 | 13.5 | 18.3 | 25 | 32 | 44 | 60 | 77 | 97 |
| B2 | Cables and wires in protective tubes and installation conduits | – | 9.6 | 12 | 16.5 | 23 | 29 | 40 | 53 | 67 | 83 |
| C | Cables and wires at walls | – | 11.7 | 15.2 | 21 | 28 | 36 | 50 | 66 | 84 | 104 |
| D | Cables and wires on a bed | – | 11.5 | 16.1 | 22 | 30 | 37 | 52 | 70 | 88 | 114 |

Depiction in accordance with DIN EN 60 204 for PVC-insulated copper wires in an ambient temperature of + 40 °C under permanent operating conditions.
For different conditions and temperatures, installations, insulation materials or conductors the relevant corrections have to be carried out.



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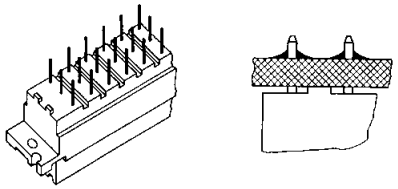
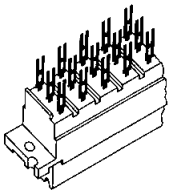
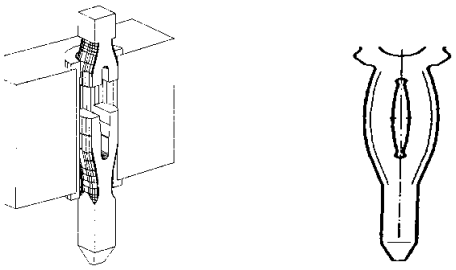
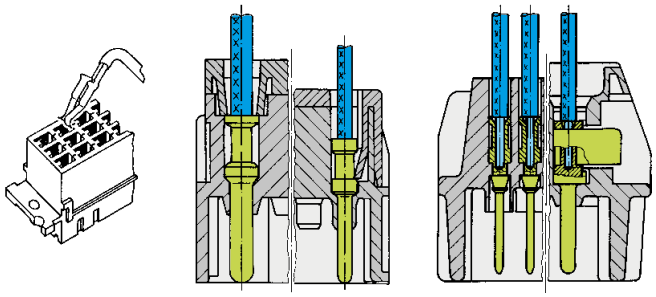
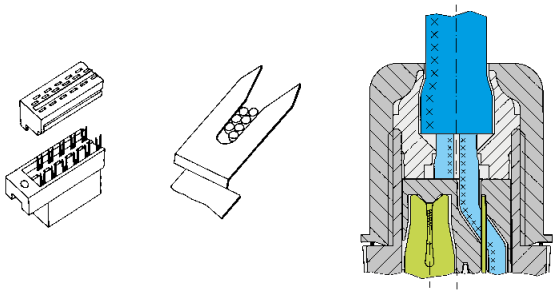
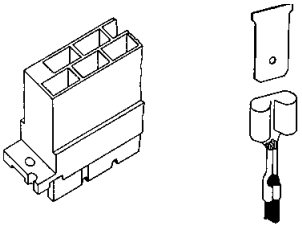
| | |
|---|---|
| Solder pins for printed circuit boards<br><br>Solder pins for reflow soldering |  |
| Solder lugs for discrete wiring |  |
| Press-in technology for printed circuit boards |  |
| Crimp contacts for flexible wiring, selective loading and ease of replacement |  |
| Insulation displacement contacts for mass termination of flat cable or round cable |  |
| Faston blades for higher power discrete wiring |  |



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## Screw terminal

Screw terminals meet VDE 0609 / EN 60 999. Dimensions and tightening torques for testing are shown opposite.

The relevant regulations state that in the case of

- Terminals with wire protection.
  – the use of ferrules is not necessary

## Axial screw terminal

This termination associates the benefits of screw and crimp terminals.

- Less space required
- Easy handling
- No special tools

The axial screw termination is suitable for fine strands wires.

## Cage-clamp terminal

This termination method requires very little preparation of the wire and no special tools, leading to a low installed cost and a high degree of mechanical security.

- For all stranded and solid wires with a cross section 0.14 to 2.5 mm².
- Ease of termination. Conductor and screwdriver are in same plane.
- No special preparation of stripped conductor.
- The larger the conductor the higher the clamping force.
- The termination is vibration-proof.
- Guaranteed constant low resistance connection of the cage-clamp terminal.
- The cage-clamp system is internationally approved. VDE, SEV, CSA, UL, ÖVE, SEMKO, LCIE (France), Germanischer Lloyd, DET Norske Veritas

## Solder connection

The term “soldering” is defined in DIN 8505:

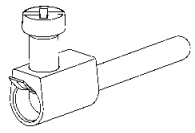
> “Soldering is a method of connecting metallic materials using an additional melting metal, if necessary with the assistance of a flux and/or protective gas. The melting temperature of the solder must lie beneath the minimum melting temperature of the base metals being connected. These base metals shall be tinned without melting themselves.”

Soft solders commonly used on electronic equipment are to DIN 1707-100. Todays lead free solders have a melting range between 217 °C and 227 °C depending on the composition of the alloy. For soldering metallic materials the flux is defined in DIN EN 29 454-1. Tests are explained in DIN 8526.

Screw dimensions and tightening torque for screw terminals

| Wire gauge (mm²) | 1.5 | 2.5 | 4 | 6 | 10 | 16 |
|---|---|---|---|---|---|---|
| Screw thread | M 3 | M 3 | M 3.5 | M 4 | M 4 | M 6 |
| Test moment of torque (Nm) | 0.5 | 0.5 | 0.8 | 1.2 | 1.2 | 1.2* |
| min. pull-out for stranded wire (N) | 40 | 50 | 60 | 80 | 90 | 100 |

* for screws without heads (Han® K 4/8)



with wire protection

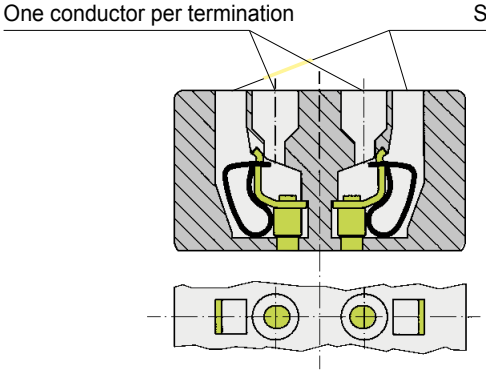
## Remarks on the axial screw technique

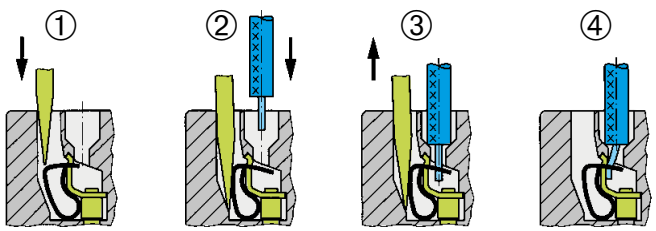
The wire gauges mentioned in the catalogue refer to geometric wire gauges of cables.

***Background:***
According to DIN VDE 0295 for cables and insulated wires the wire gauge will be determined by conductance (Ω/km) and maximum wire diameter. A minimum cable diameter is not specified!
(Example: nominal wire gauge 95 mm² ➔ real, geometric wire gauge 89 mm²)

***Recommendation:***
The use of cables with extreme geometric wire gauge deviation should be checked separately with the use of the axial screw termination.

One conductor per termination — Slot for screwdriver






Screwdriver width: 3.0 x 0.5 mm



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Solderless termination for connectors has proven to be reliable for decades. Today the use of press-in connectors encompasses all fields of electrical and electronical applications.

Pressing of electrical components, mainly connectors, is characterised through the matching of the connector pin and the plated through hole of the pcb. Whereas the desired electrical characteristics can be attained relatively independant from the design of the press-in zone, the mechanical characteristics of the press-in zone are crucial for the reliable assembly of connectors where pcb's have different surfaces.

Although the scope of requirements at the press-in process is generally defined in time-tested specifications, the novel press-in zones should offer an optimal handling and a reliable termination. Essentially, this is guaranteed through the design of the press-in zone and the meticulous observance of tolerances. HARTING has been using FEM simulations for the calculation and optimisation of press-in zones for a long period of time. This expertise allows us to simulate various pcb configurations very accurate.

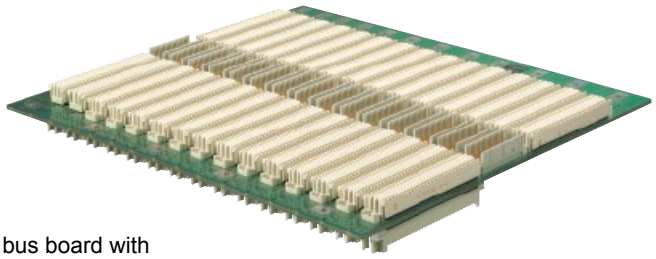
Due to the high deformation resistance and resilience of har:press contacts, they can be easily and repeatedly removed in case of repairs without impairment to their functioning.

har:press is extremely versatile and offers a reliable electrical contact, therefore it is especially well suited for applications with these surfaces.

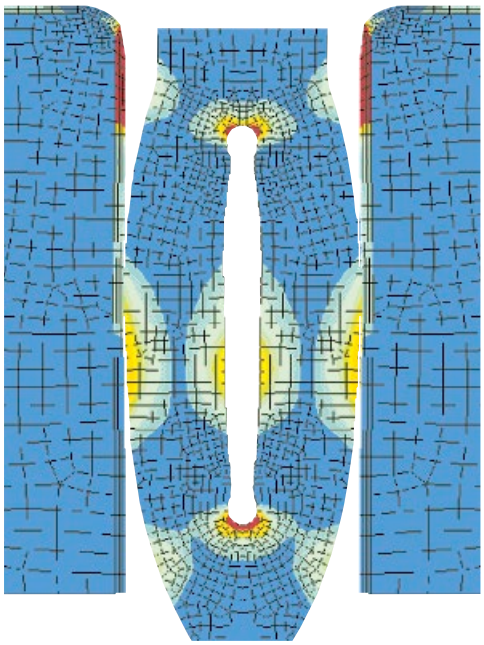
Please contact us for detailed test reports.

**Benefits of the press-in technology**

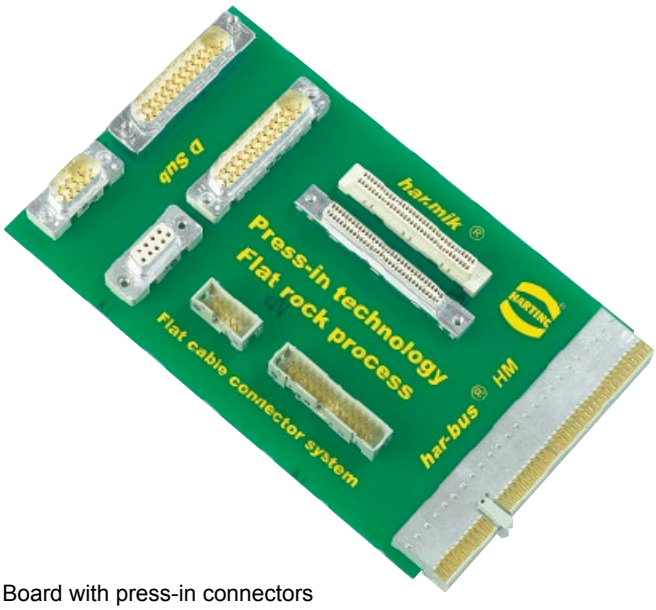
- Thermal shocks associated with the soldering process and the risk of the board malfunction are avoided.
- No need for the subsequent cleaning of the assembled pcb's
- Additional wrap connections are made possible by using connectors with long pins
- Unlimited and efficient processing of partially gold-plated pins for rear I/O - manual soldering is no longer necessary!



bus board with press-in connectors



FEM simulation of the needle eye press-in zone




Board with press-in connectors



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The processing of press-in connectors can be divided into 3 phases, containing both mechanical and metallurgical operations:

1. **Centering and placing of the termination pins**

   The centering of connectors before pressing is important in order to prevent damage to the pcb and the termination pins. Centering can be omitted when connectors are pressed using a flat rock die.

   HARTING offers insert blocks for male connectors to make the centering of connectors unnecessary.

2. **Pressing in the pins**

   In the press-in process the insertion force is continuously transformed into compression force. The resulting friction frees the contacting bars of insulating films. Superfluous plating (tin) is transferred within the plated through hole. A gas-tight connection of fresh non-oxidised metal surfaces is obtained.

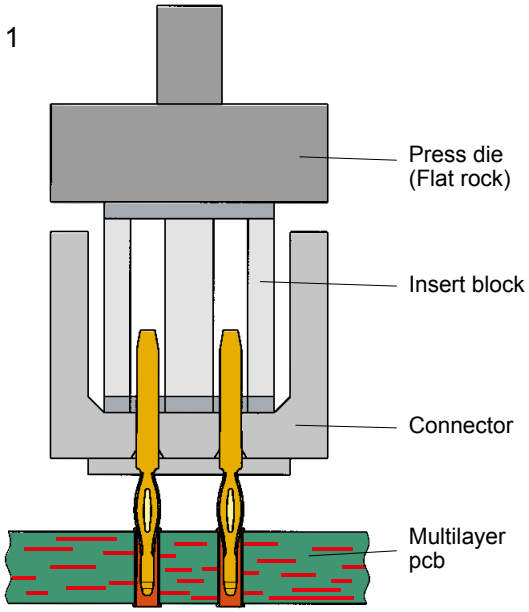
3. **Obtaining the final position**

   The press-in operation should be terminated as soon as the connector obtains its final position on the pcb to avoid unnecessary compressive stress. The press-in machines of HARTING feature automatic termination of the press-in operation independant of pcb thickness and surface properties.

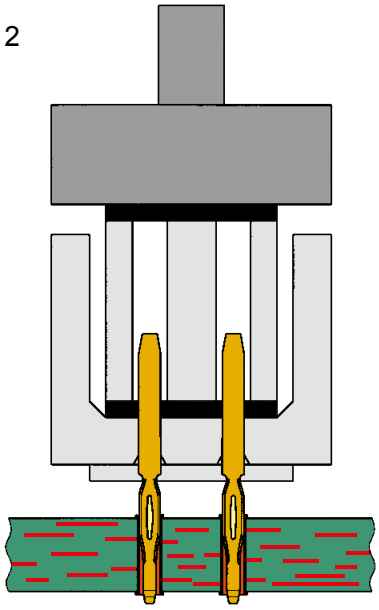
The entire dynamic press-in process is characterised through changes of the press-in force that can be statistically evaluated. HARTING records the changes of force with the help of special software. This is an important step towards permanent process control and documented manufacturing data.

The har:press-zone is based on the industry renowned needle eye technology. Its special design allows for compensation of tolerances of pcb surface properties (eg. superfluous tin plating). The excessive material is displaced within the plated through hole, whereby a gas-tight and corrosion resistant electrical connection is assured.

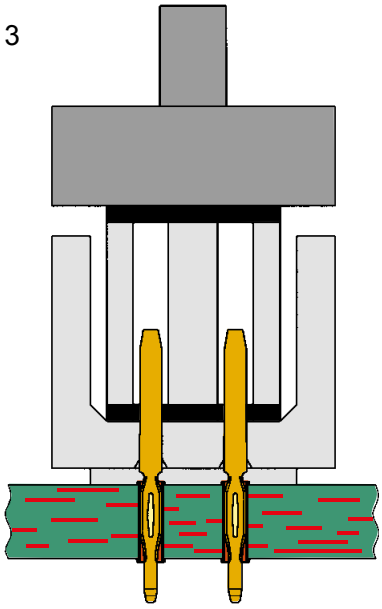
Phase 1




Phase 2



Phase 3





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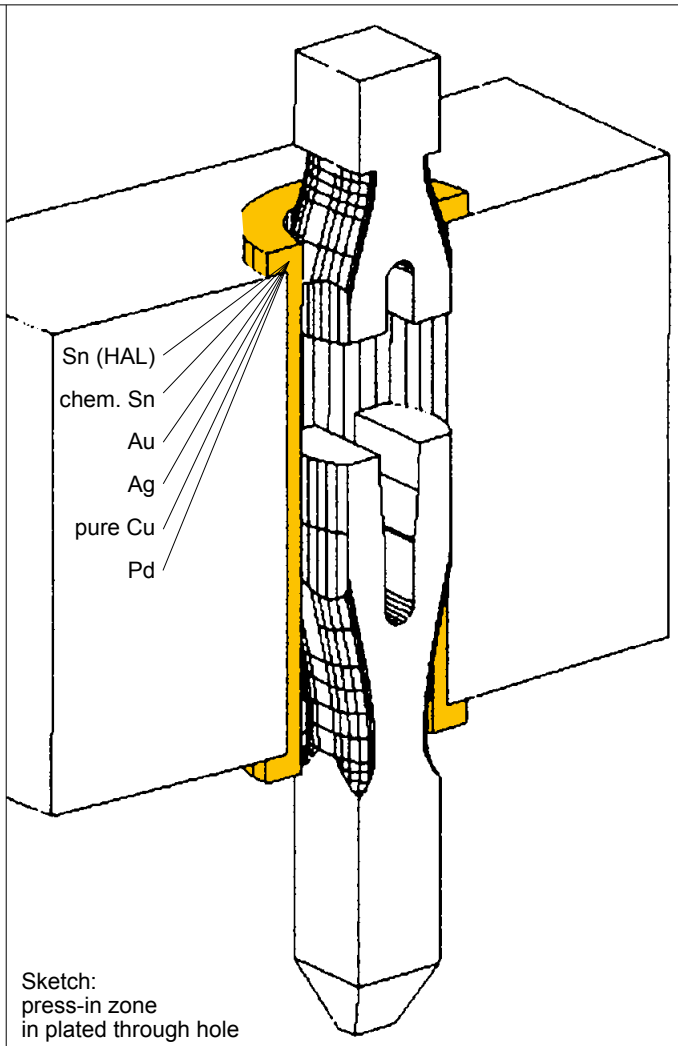
## Recommended configuration of plated through holes

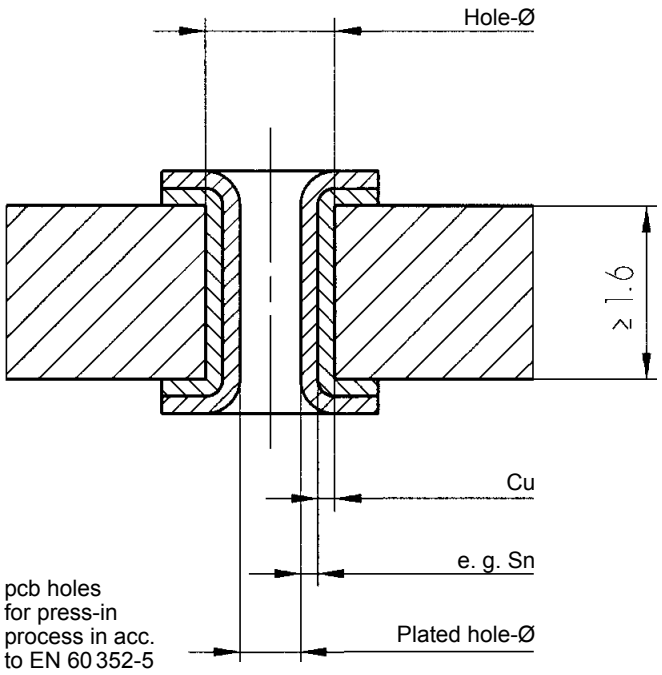
In addition to the hot-air-level (HAL) other pcb surfaces are getting more important. Due to their different properties, such as mechanical strength and coefficient of friction we recommend the following configuration of pcb through holes.

| | | |
|---|---|---|
| *Tin-lead plated PCB (HAL) acc. EN 60 352-5* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Sn | max. 15 µm |
| | Plated hole-Ø | 0.94-1.09 mm |
| *Chemical tin-plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Sn | min. 0.8 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *Au / Ni plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Ni | 3-7 µm |
| | Au | 0.05-0.12 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *Silver plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Ag | 0.1-0.3 µm |
| | Plated hole-Ø | 1.00-1.10 mm |
| *OSP copper plated PCB* | Hole-Ø | $1.15^{\pm 0.025}$ mm |
| | Cu | min. 25 µm |
| | Plated hole-Ø | 1.00-1.10 mm |

PCB board thickness: ≥ 1.6 mm




Sketch:
press-in zone
in plated through hole




pcb holes
for press-in
process in acc.
to EN 60 352-5



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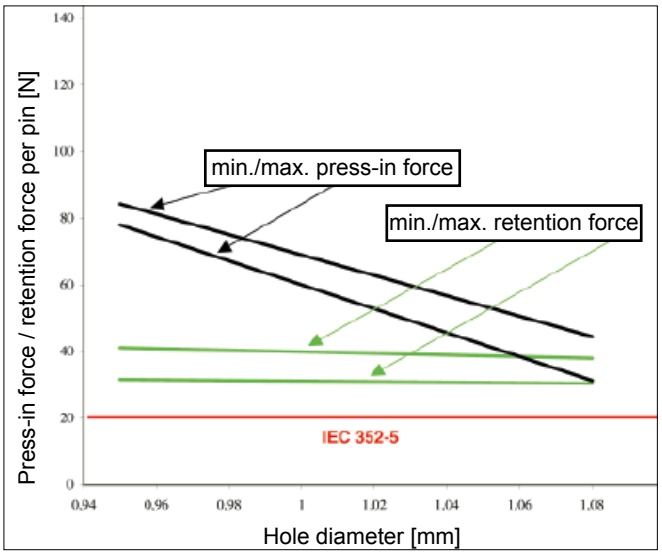
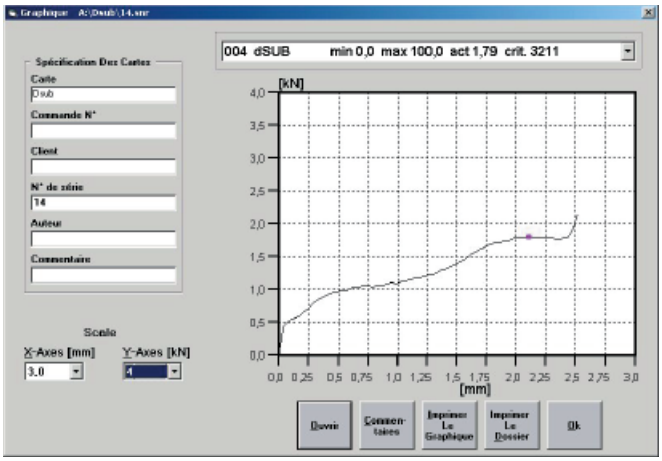
## Quality control of the press-in termination

The press-in force correlates with the diameter of the plated through hole and with the friction coefficient of the surface; therefore it can be used for a continuous monitoring of the process.

The retention force, as an indirect measure of the normal force, serves to qualify the process or random tests

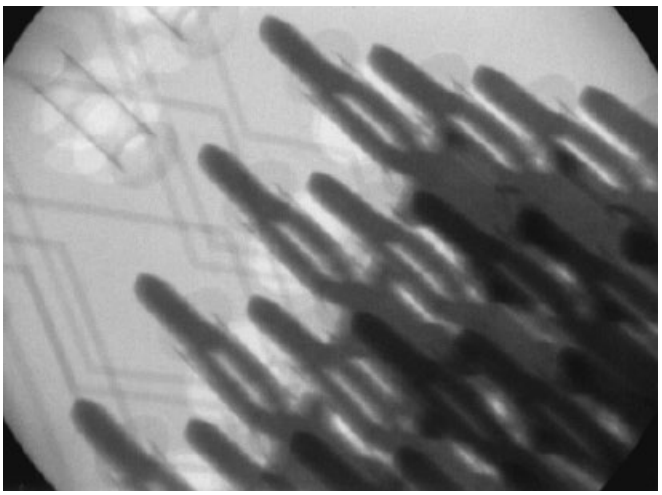



Typical press-in and retention forces for the D-Sub press-in zone




The automatic press-in machines of HARTING feature a graphical user interface for monitoring the process and the quality of the press-in termination (see chapter 20).

HARTING assists you with the most advanced quality assurance methods beyond the usual scope.



X-ray photo of a pressed-in connector



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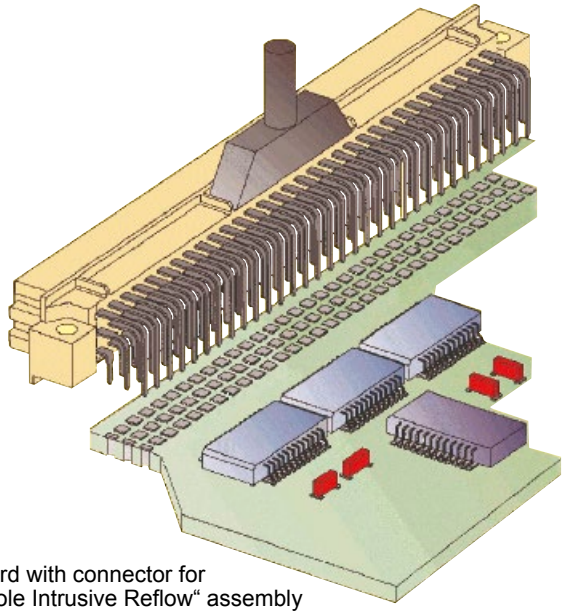
# Introduction of the Pin in Hole Intrusive Reflow Process

**The continuing trend towards miniaturisation has revolutionised the assembly of electronic components. For the past 15 years, most components have been secured directly to the pcb surface by means of Surface Mount Technology (SMT). By dispensing with drilled holes on the pcb, a space saving of up to 70 percent is achieved.**

Today, typical components such as resistors, ICs, capacitors, and connectors with straight terminal pins are almost exclusively fitted using SMD (Surface Mount Device) technology in mass production. In contrast, angled SMD connectors at the edge of the board have not been successful because of tolerance problems (co-planarity) and stresses during mating. Modified solder connectors for assembly with „Pin in Hole Intrusive Reflow“ process offer a better solution. These can be mounted at low cost, utilising existing SMD production lines.



SMT board with connector for „Pin in Hole Intrusive Reflow“ assembly

## “Pin in Hole Intrusive Reflow“

In this process, the connector is inserted into plated through holes in a comparable way to conventional component mounting. All other components can be assembled on the pcb surface.

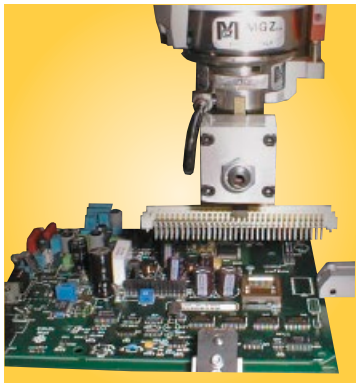
The components are positioned using pick-and-place machines. These automatic assembly machines differ according to whether the components are small, lightweight or bulky. Connectors are considered bulky (odd form) because of their comparatively heavy weight and large volume which makes them more difficult to grip. Furthermore, machines for odd form components must have higher insertion power to fit the components into pcb holes, which are filled with solder paste. As a rule, modern SMC production lines are equipped with both types of machine, therefore the „Pin in Hole Intrusive Reflow“ process generally entails no extra investment costs for the user.

**Conventional assembly process:**

1. Application of solder paste
2. Positioning the components
3. Positioning odd form components
4. Reflow soldering
5. Pressing in or partially dip soldering the connector at the board edge
6. Quality inspection

**„Pin in Hole Intrusive Reflow“ assembly:**

1. Application of solder paste
2. Positioning the components
3. Positioning odd form components
4. Reflow soldering
5. ~~Pressing in or partially dip soldering the connector at the board edge~~
6. Quality inspection



Pick-and-place machine for odd form components (Courtesy of JOT Automation GmbH)



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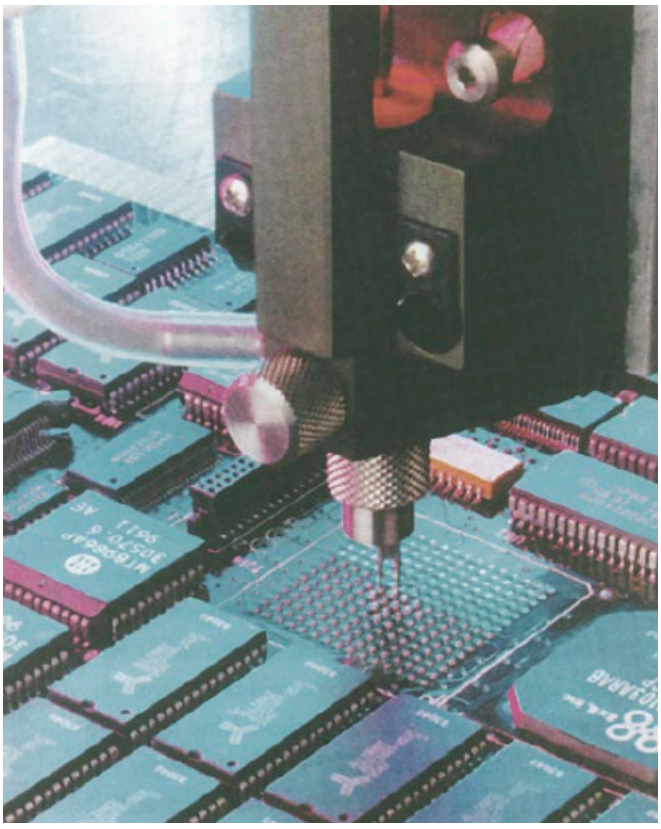
## Application of solder paste

Before the components are assembled, solder paste must be applied to all the solder pads (for connecting surface-mount components) and the plated through contacts (pcb holes for „Pin in Hole Intrusive Reflow“ insertion). Usually a screen printing process is used for this purpose. A squeegee moves across the pcb, which is masked with screens and presses the solder paste into all unmasked areas. To ensure that the plated through holes are completely filled, significantly more solder paste must be applied than traditional solder pads on the pcb surface. The required quantity can be set exactly via several parameters.

As an alternative to screen printing, the solder paste can be applied by means of a dispenser. A high-precision robot moves the dispenser to all required positions on the pcb. The dispensing method is particularly suitable for small pcb's or applications which demand high precision and flexibility in dispensing volumes.



Dispenser in operation

## Requirements for the solder connection

There are numerous scientific studies dealing with calculation of the required quantity of solder paste. These studies use various parameters, e.g. the shrinking factor of the paste during soldering or the thickness of the screens used for masking the pcb. Since such calculation methods are complicated to apply, the following rule of thumb has proved valuable in practice:

$$V_{Paste} = 2(V_H - V_P)$$

in which:

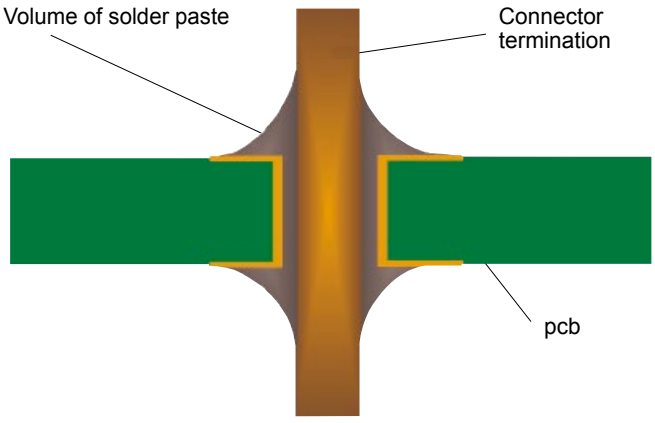
$V_{Paste}$ = Required volume of solder paste

$V_H$ = Volume of the plated through hole

$V_P$ = Volume of the connector termination in the hole

Comment: the multiplier „2“ compensates for solder paste shrinkage during soldering. For this purpose, it was assumed that 50 % of the paste consists of the actual solder, the other 50 % being soldering aids.

At the beginning of a new production batch, the process parameters, such as quantity of solder paste and soldering temperature, can be set by interpreting simple cross-sections of the soldered connection. A reliable measure for achieving optimum parameters is the quantity of solder required to fill the hole. In soldered connections of high quality, the holes are filled to between 75 % and 100 %.




Plated through hole with connector termination



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## SMC connectors

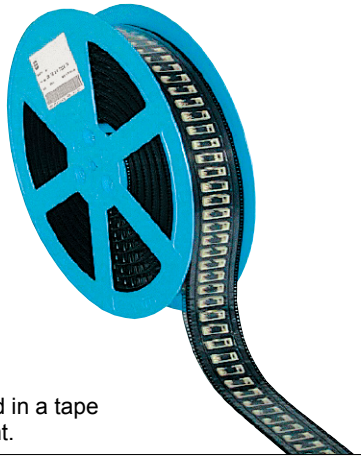
SMC (Surface Mount Compatible) connectors have to withstand temperatures of up to 225°C in the reflow oven for 10 to 15 seconds. Therefore, the moulding must be made from a dimensionally stable plastic which expands at the same rate as the pcb material when subjected to heat.

The length of the connector contacts should be such that they protrude by no more than 1.5 millimetres after insertion to the pcb. Each contact collects solder on its tip as it penetrates the solder paste in the hole. So if the contact was too long, this solder would no longer be able to reflow back into the plated through hole by capillary action during the soldering process, therefore the quality of the soldered connection would suffer as a result.

Connector design must permit both automatic assembly with pick-and-place machines and manual positioning for test and pre-production batches. It is also important for the packaging of the connectors to be suitable for automated assembly. Experience shows that deep-drawn film and reel packaging fed into the pick-and-place machines with the aid of a conveyor system is particularly suitable.

**Advantages for using SMC connectors are:**

- Partial dip soldering or press-in is no longer required
- High mechanical stability
- Complete compatibility with Surface Mount Technology
- Savings through integration into the automated assembly process
- Reduced floor space in the production plant



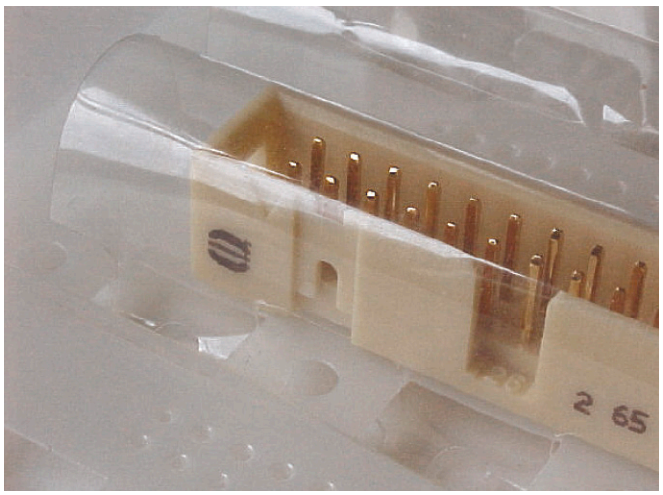
HARTING connector mounted in a tape ready for automatic placement.

## HARTING SMC technology

HARTING offers its customers a complete system concept for integrating SMC technology into existing production lines. We manufacture a wide range of SMC connectors (3 and 5 row) in compliance with IEC 60 603-2 and D-Sub connectors in compliance with IEC 60 807. In addition, HARTING supports the market with packaging and processing concepts, which have been developed in collaboration with renowned manufacturers of SMC soldering and assembly plants.

**Advantages of the „Pin in Hole Intrusive Reflow“ process:**

- Partial dip soldering or press fitting is no longer required
- Complete compatibility with Surface Mount Technology
- Complete integration into the automated assembly process
- Reduced floor space in the production plant
- As a rule, no additional investment costs



HARTING connector mounted in a tape ready for placement using an odd form assembly station.



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## Crimp connection

A perfect crimp connection is gastight, therefore corrosion free and amounts to a cold weld of the parts being connected. For this reason, major features in achieving high quality crimp connections are the design of the contact crimping parts and of course the crimping tool itself. Wires to be connected must be carefully matched with the correct size of crimp contacts. If these basic requirements are met, users will be assured of highly reliable connections with low contact resistance and high resistance to corrosive attack.

The economic and technical advantages are:

- Constant contact resistance as a result of precisely repeated crimp connection quality
- Corrosion free connections as a result of cold weld action
- Pre-preparation of cable forms with crimp contacts fitted
- Optimum cost cable connection

Requirements for crimp connectors are laid down in DIN IEC 60 352-2, Amend. 2, as illustrated in the table.

Pull out force of stranded wire

The main criterion by which to judge the quality of a crimp connection is the retention force achieved by the wire conductor in the terminal section of the contact. DIN IEC 60 352, part 2, defines the extraction force in relation to the cross-section of the conductor.

When fitted using HARTING crimping tools and subject to their utilization in an approved manner, our crimp connectors comply with the required extraction forces.

## Crimping tools

Crimping tools (hand operated or automatic) are carefully designed to produce with high pressure forming parts a symmetrical connection of the crimping part of the contact and the wire being connected with the minimum increase in size at the connection point. The positioner automatically locates the crimp and wire at the correct point in the tool.

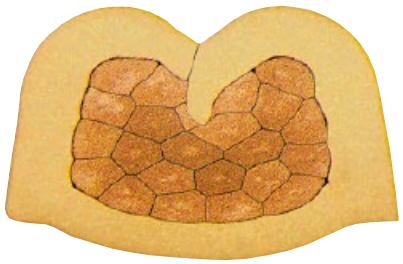
A ratchet in the tool performs 2 functions:

It prevents insertion of the crimp into the tool for crimping before the jaws are fully open

It prevents the tool being opened before the crimping action is completed

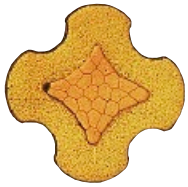
Identical, perfectly formed, connections can be produced using this crimping system.

Crimp-cross section



B shape cross section stamped contact

H shape
cross section turned contact



4 points shape
cross section turned contact

Tensile strength of crimped connections

| Conductor cross-section | | Tensile strength |
|---|---|---|
| mm² | AWG | N |
| 0.05 | 30 | 6 |
| 0.08 | 28 | 11 |
| 0.12 | 26 | 15 |
| 0.14 | | 18 |
| 0.22 | 24 | 28 |
| 0.25 | | 32 |
| 0.32 | 22 | 40 |
| 0.5 | 20 | 60 |
| 0.75 | | 85 |
| 0.82 | 18 | 90 |
| 1.0 | | 108 |
| 1.3 | 16 | 135 |
| 1.5 | | 150 |
| 2.1 | 14 | 200 |
| 2.5 | | 230 |
| 3.3 | 12 | 275 |
| 4.0 | | 310 |
| 5.3 | 10 | 355 |
| 6.0 | | 360 |
| 8.4 | 8 | 370 |
| 10.0 | | 380 |

Extract from DIN IEC 60 352-2, Amend. 2, Table IV



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# Hoods/housings connector insert protection

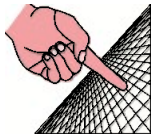
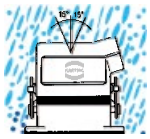
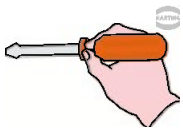
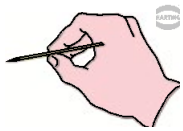
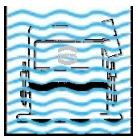
The connector's housing, sealing and locking mechanism protect the connection from external influences such as mechanical shocks, foreign bodies, humidity, dust, water or other fluids such as cleansing and cooling agents, oils, etc. The degree of protection the housing offers is explained in the IEC 60 529, DIN EN 60 529, standards that categorize enclosures according to foreign body and water protection.

The following table shows the different degrees of protection.

**Code letters** (International Protection) — **IP**

**First Index Figure** (Foreign bodies protection) — **6**

**Second Index Figure** (Water protection) — **5**

| Index figure | Degree of protection | | | Index figure | Degree of protection | | |
|---|---|---|---|---|---|---|---|
| **0** | No protection | | No protection against accidental contact, no protection against solid foreign bodies | **0** | No protection against water | | No protection against water |
| **1** | Protection against large foreign bodies | | Protection against contact with any large area by hand and against large solid foreign bodies with Ø > 50 mm | **1** | Drip-proof | | Protection against vertical water drips |
| **2** | Protection against medium sized foreign bodies |  | Protection against contact with the fingers, protection against solid foreign bodies with Ø > 12 mm | **2** | Drip-proof |  | Protection against water drips (up to a 15° angle) |
| **3** | Protection against small solid foreign bodies |  | Protection against tools, wires or similar objects with Ø > 2.5 mm, protection against small foreign solid bodies with Ø > 2.5 mm | **3** | Spray-proof | | Protection against diagonal water drips (up to a 60° angle) |
| **4** | Protection against grain-shaped foreign bodies |  | As 3 however Ø > 1 mm | **4** | Splash-proof | | Protection against splashed water from all directions |
| **5** | Protection against injurious deposits of dust | | Full protection against contact. Protection against interior injurious dust deposits | **5** | Hose-proof | | Protection against water (out of a nozzle) from all directions |
| **6** | Protection against ingress of dust | | Total protection against contact. Protection against penetration of dust | **6** | Strong hose-proof | | Protection against strong water (out of a nozzle) from all directions |
| | | | | **7** | Protected against immersion | | Protected against temporary immersion |
| | | | | **8** | Water-tight |  | Protected against water pressure |

Description according to DIN EN 60 529, IEC 60 529



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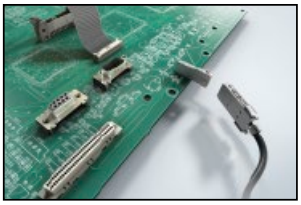
☐ 

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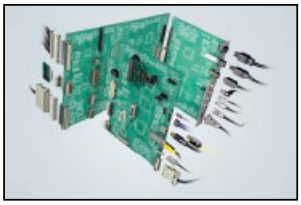
☐ 

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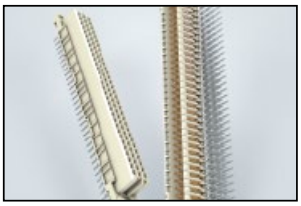
☐ 

**Connectors DIN 41 612**

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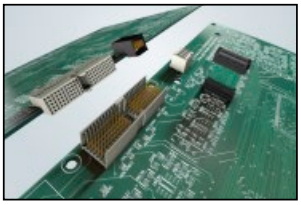
**Intelligent Network Solutions**

☐ 

**Coaxial and Metric Connectors**

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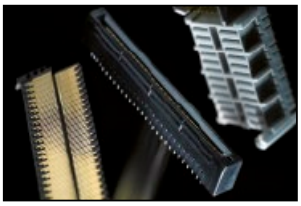
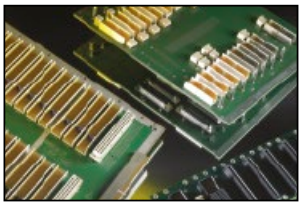
**Application brochure**

☐ 

**TCA Connectors**

☐ 

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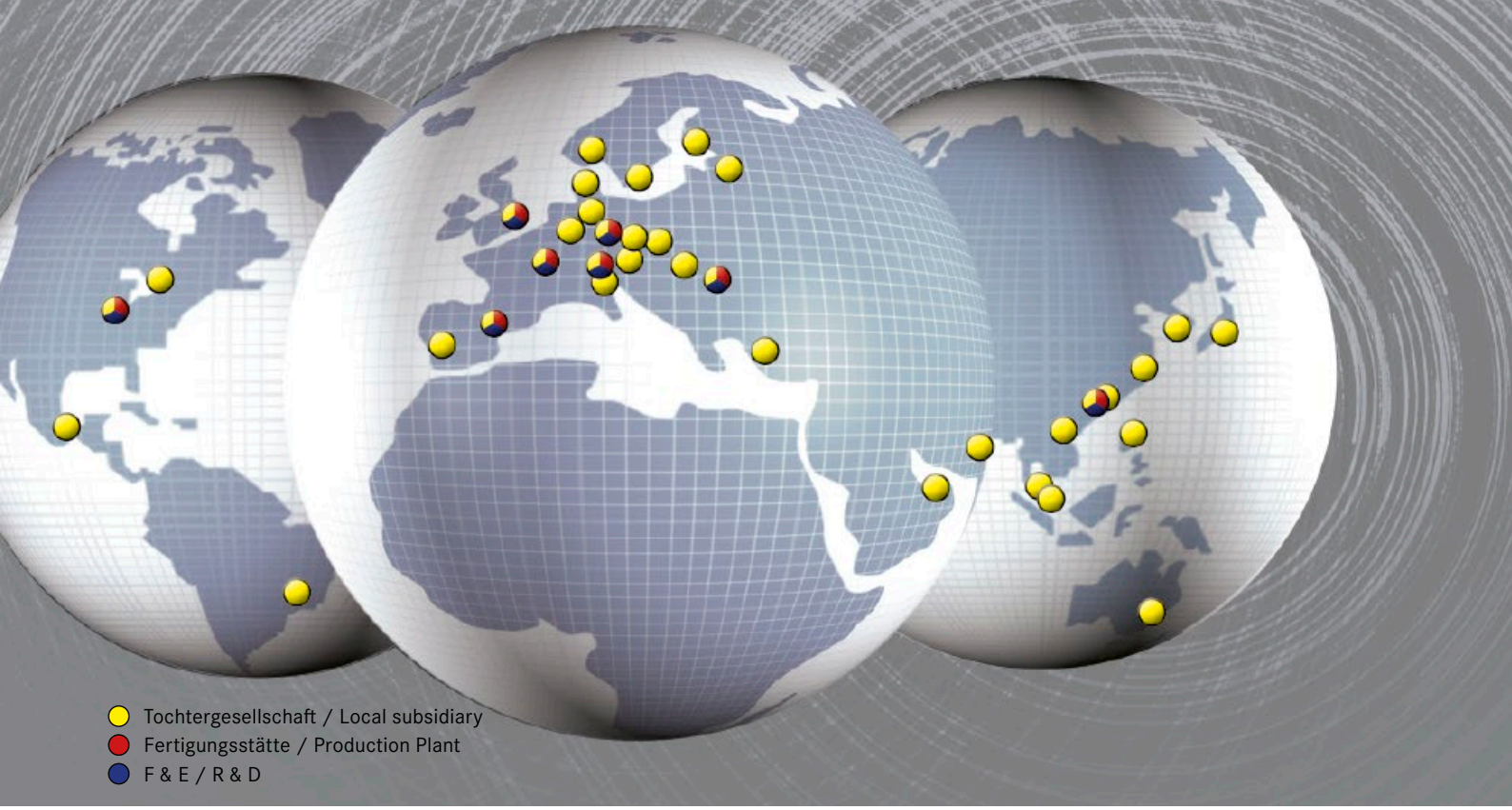


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