



HARTING Ethernet Cabling

Data Communication Networks for the Industry, Automation and Transportation

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 housing technology and shop systems.

The HARTING Group currently comprises 14 production sites and branches in 44 countries worldwide employing a total of about 6,000 staff.



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.



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, aluminium 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.

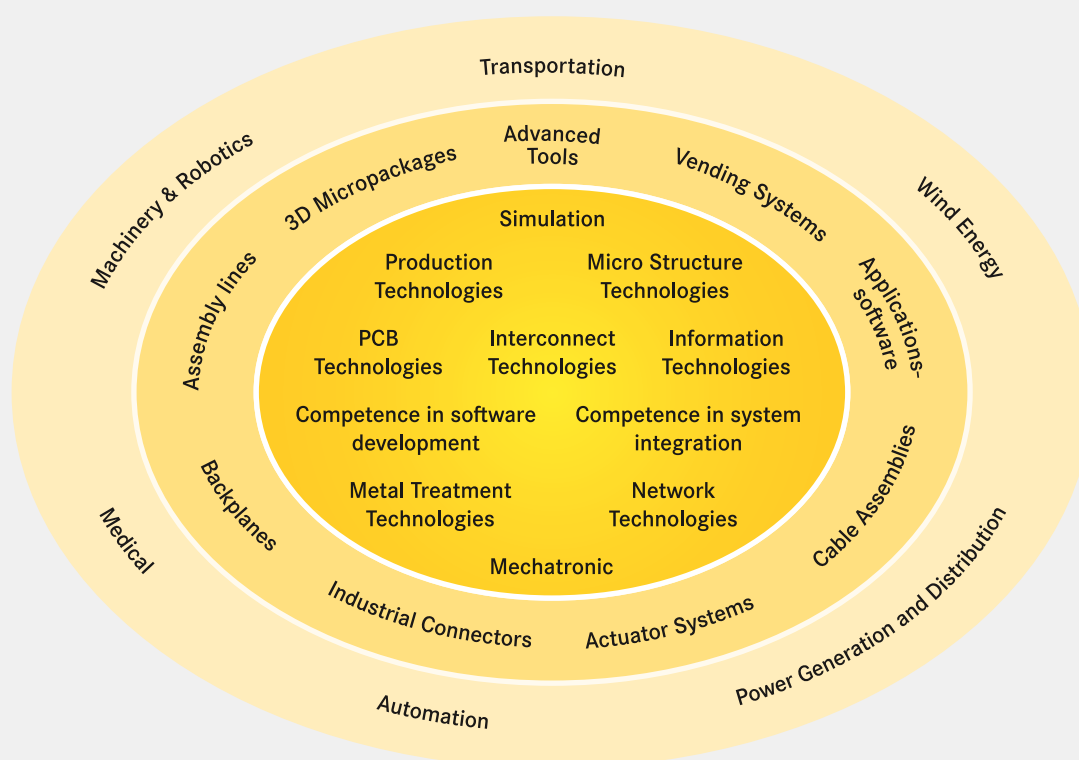
In order to ensure the future-proof design of RF and EMC-compatible interface solutions, the central **HARTING** laboratory (accredited according to DIN EN ISO/IEC 17025) employs simulation tools, as well as experimental, testing and diagnostics facilities all the way to Industrial computed tomography. In addition to product and process suitability considerations, lifecycle and environmental aspects play a key role in the selection of materials and processes.



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.





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.

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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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This catalogue covers data network cabling for Ethernet in accordance with IEEE802.3.

These support all commonly used Ethernet transmission speeds:

Fast Ethernet with 10 Mbit/s, 100 Mbit/s, Gigabit Ethernet and 2.5 / 5 or 10 Gbit/s Ethernet for future applications.

PoE (Power over Ethernet) is supported (power on terminal device with up to 12.95 W in compliance with IEEE802.3af, up to 25.5 W in compliance with IEEE802.3at and 71.3 W in compliance with IEEE802.3bt). so that devices can be supplied with power through their Ethernet cables.

In order to make it easier for our customers to use HARTING cabling solutions and components in their applications, we have special solutions for:

- Automation technology, machine and systems engineering, robotics and other industrial applications
- F+B (food and beverage industry)
- Railway and transportation systems (e.g. bus, tram, metro)

Many of the products listed here can also be used for structured building cabling because the HARTING data networking components and systems are standard-compliant.

HARTING focuses on industrial and industry-related applications. We are working, together with our partner ZVK GmbH (www.zvk-gmbh.de), on the interfaces between facilities, machines and buildings. ZVK focuses on the building cabling itself.

HARTING's solutions are designed, tested and certified for the entire industry.

So IPx protection, mating reliability, robustness, vibration resistance and EMC safety are all critical factors.

For all automation applications, compatibility with the corresponding automation profiles according to IEC 61784-5 and the associated cabling guidelines, is guaranteed.

The safety/fire tests according to EN 45 545/DIN 5510, UL 1685 and other specific or national standards are also taken into account for our railway cabling solutions.

You can find more details in the product-specific pages, the product data sheets and the test reports (available on request separately).

To ensure optimal performance of all cabling components (cable, connector, coupling, etc.), our components are tested according to the internationally established limits for Category 5/5e (100 MHz), Category 6 (250 MHz), 6A (500 MHz), Category 7 (600 MHz) and Category 7A (1000 MHz).

These limits, along with the individual product standards, can be found in the current cabling standards: ISO/IEC 11 801 (valid internationally) and EN 50173 (valid throughout Europe).

The American standards for data network components and cabling (according to TIA/EIA 568x) mostly follow the ISO/IEC 11 801. They are, however, less strict in regards to certain limits (e.g. NEXT).

Thus, all cabling components tested in accordance with ISO/IEC 11801 also comply with the limits from TIA/EIA 568x.

After the entire cable path has been installed, the user can check his channel transmission performance according to the transmission classes (Class D up to 100 MHz, Class E to 250 MHz, Class EA to 500 MHz and Class F to 600 MHz).

The entire cabling, however, must be installed before this inspection can take place. The installation instructions supplied must also be carefully followed.

HARTING also provides bus cables with 120 Ω for MVB and WTB applications and the corresponding connectors to supplement our railway cabling product portfolio.

(MVB = Multifunction Vehicle Bus, WTB = Wire Train Bus; both bus systems are still widely in use but are increasingly being replaced by Ethernet).

All HARTING components have been designed, manufactured and tested in their particular installation environments to ensure their transmission speeds, performances, mating reliability and long-term stability.

Thus, our users can rely on a complete, powerful and proven portfolio of HARTING cabling components that precisely match their needs.

More technical information, references to the international body of standards, as well as useful information and explanations can be found on the pages and chapters to follow.

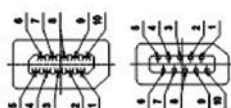
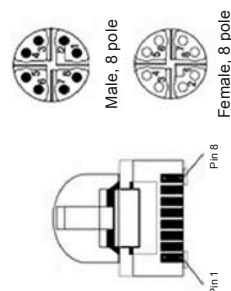
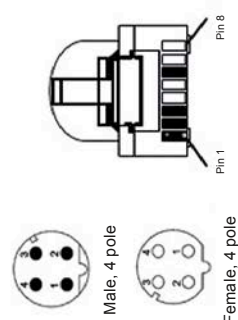
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Connector assignment

RJ45 cords



ix industrial	RJ45	M12 X-coded	1 GBASE-T 2.5 GBASE-T 5 GBASE-T 10 GBASE-T	ANSI/TIA T568 A	ANSI/TIA T568 B	ETHERNET/IP (2 pairs)	PROFINET	10BASE-T 100BASE-TX	M12 D-coded M8 D-coded	RJ45 4 pole
1	1	1	BI_DA+	white/green	white/orange	white/orange	yellow	TX+	1	1
2	2	2	BI_DA-	green	orange	orange	orange	TX-	3	2
6	3	3	BI_DB+	white/orange	white/green	white/green	white	RX+	2	3
4	4	8	BI_DC+	blue	blue					
5	5	7	BI_DC-	white/blue	white/blue					
7	6	4	BI_DB-	orange	green	green	blue	RX-	4	6
9	7	5	BI_DD+	white/brown	white/brown					
10	8	6	BI_DD-	brown	brown					
*3.8 = GND										

All pre-assembled copper cables supporting Fast Ethernet, Gigabit Ethernet or 2.5 / 5 or 10 Gigabit Ethernet are listed in the HARTING system cables/cords chapter.

Specifically, these are:

- Four-wire system cables for Fast Ethernet (Category 5 for 10 Mbit/s, 100 Mbit/s)
- Eight-wire system cables for Gigabit Ethernet (according to Category 5e or Category 6 for 1 Gbit/s, and Category 6A or Category 7 for 2.5 / 5 or 10 Gbit/s)

RJ45 and M12 system cables have standardised transmission characteristics.

All system cables manufactured by HARTING have been designed, constructed and tested according to these standards.

Our users are ensured of outstanding safety levels when using HARTING system cables in their facilities.

The following exceptions should be noted:

- System cables (also sometimes referred to as patch cables, connecting cables or cabinet cables) are limited to 10 metres. If the system cables need to be longer than 10 metres, then the transmission characteristics must be calculated and checked according to the relevant category formulas.

For simplicity's sake, transmission classes are often used as the basis for making this check. This is a legitimate method; however, in extreme cases this means that long system cords must be tested within the facility cabling.

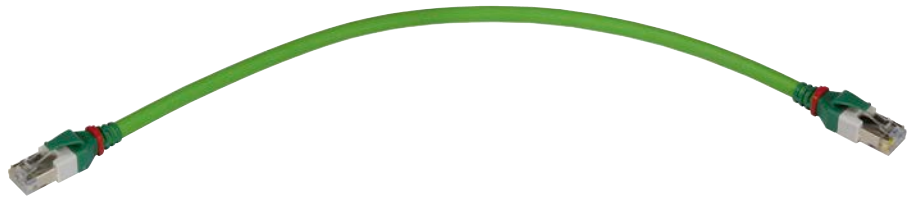
- System cables are only defined as an RJ45 male plug – cable – RJ45 male plug combination. Since users often need other combinations in the real world, HARTING has expanded its system cabling portfolio.

This includes combinations such as male plug – cable – female socket or custom constructions such as male plug – cable – preLink® terminating block.

To ensure quality and performance, HARTING has established relevant limit values and measurement methods which are often not yet adequately represented in the standards.

- Many industrial, railway or telecommunications applications require customised designs to achieve durable yet cost-effective solutions. Such customised solutions are provided by the GBU HCS.

(HCS = HARTING Customised Solutions)



HARTING RJ Industrial®
system cable, 4-wire, straight, Cat. 5

Features

- Connector types RJ45
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material PVC/PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Large temperature range
- Locking lever protection
- PROFINET compliant
- Useable as trailing cable (type C)

Technical characteristics

- Connector types RJ45 overmoulded and locking lever protection
- Cable type 4 x AWG 22/7, Cat. 5, Star quad, double shielding
- Sheath material
 - Type B PVC
 - Type C PUR
- Wiring 4 pole, contacts 1/2 and 3/6
- Transmission performance Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -25 °C ... +60 °C
- Colour Green (PROFINET), Red (SERCOS III)

Identification		Part number	
		Profinet	SERCOS III
HARTING RJ system cable, compact 4-wire Type B			
Length	0.5 m	09 48 686 8001 005	09 48 686 8006 005
	1.0 m	09 48 686 8001 010	09 48 686 8006 010
	1.5 m	09 48 686 8001 015	09 48 686 8006 015
	3.0 m	09 48 686 8001 030	09 48 686 8006 030
	5.0 m	09 48 686 8001 050	09 48 686 8006 050
	7.5 m	09 48 686 8001 075	09 48 686 8006 075
	10.0 m	09 48 686 8001 100	09 48 686 8006 100
	15.0 m	09 48 686 8001 150	09 48 686 8006 150
	20.0 m	09 48 686 8001 200	09 48 686 8006 200
HARTING RJ system cable, compact 4-wire Type C			
Length	0.5 m	09 48 686 8004 005	09 48 686 8007 005
	1.0 m	09 48 686 8004 010	09 48 686 8007 010
	1.5 m	09 48 686 8004 015	09 48 686 8007 015
	3.0 m	09 48 686 8004 030	09 48 686 8007 030
	5.0 m	09 48 686 8004 050	09 48 686 8007 050
	7.5 m	09 48 686 8004 075	09 48 686 8007 075
	10.0 m	09 48 686 8004 100	09 48 686 8007 100
	15.0 m	09 48 686 8004 150	09 48 686 8007 150
	20.0 m	09 48 686 8004 200	09 48 686 8007 200

Other cable lengths on request



HARTING RJ Industrial®
system cable, 4-wire, angled, Cat. 5

Features

- Connector types RJ45
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material PVC/PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- Locking lever protection
- PROFINET compliant
- Useable as trailing cable (type C)

Technical characteristics

- | | |
|-----------------------------|---|
| Connector types | RJ45 overmoulded and locking lever protection |
| Cable type | 4 x AWG 22/7, Cat. 5, Star quad, double shielding |
| Sheath material | |
| Type A | PVC |
| Type B | PVC |
| Type C | PUR |
| Wiring | 4 pole, contacts 1/2 and 3/6 |
| Transmission performance | Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1 |
| Data rate | 10 Mbit/s, 100 Mbit/s |
| Shielding | Fully shielded, 360° shielding contact |
| Operating temperature range | -40 °C ... +70 °C |
| Colour | Green (PROFINET)
Black (PROFINET Outdoor) |

Identification	Part number	
HARTING RJ Industrial® system cable, angled, 4-wire Type A, angled left to angled right		
Length 0.5 m	09 47 050 6001	
1.0 m	09 47 050 6002	
1.5 m	09 47 050 6003	
2.0 m	09 47 050 6004	
3.0 m	09 47 050 6005	
5.0 m	09 47 050 6007	
HARTING RJ Industrial® system cable, angled, 4-wire Type B, angled left to angled right		
Length 0.5 m	09 47 050 6023	
1.0 m	09 47 050 6024	
1.5 m	09 47 050 6025	
2.0 m	09 47 050 6026	
3.0 m	09 47 050 6027	
5.0 m	09 47 050 6029	
HARTING RJ Industrial® system cable, angled, 4-wire Type C, angled left to angled right		
Length 0.5 m	09 47 050 6045	
1.0 m	09 47 050 6046	
1.5 m	09 47 050 6047	
2.0 m	09 47 050 6048	
3.0 m	09 47 050 6049	
5.0 m	09 47 050 6051	
HARTING RJ Industrial® system cable, angled, 4-wire Type B, outdoor, angled left to angled right		
Length 0.5 m	09 47 050 6067	
1.0 m	09 47 050 6068	
1.5 m	09 47 050 6069	
2.0 m	09 47 050 6070	
3.0 m	09 47 050 6071	
5.0 m	09 47 050 6073	

Other cable lengths on request



RJ45 cords

HARTING RJ Industrial®
system cable, 4-wire, angled, Cat. 5



Features		Technical characteristics	
• Connector types	RJ45	Connector types	RJ45 overmoulded and locking lever protection
• Category	Cat. 5	Cable type	4 x AWG 22/7, Cat. 5, Star quad, double shielding
• Number of wires	4	Sheath material	
• Wiring	1:1	Type A	PVC
• Sheath material	PVC/PUR	Type B	PVC
		Type C	PUR
Application		Wiring	4 pole, contacts 1/2 and 3/6
• Industrial Cabling		Transmission performance	Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
• Within switch cabinets		Data rate	10 Mbit/s, 100 Mbit/s
• On machines and control units		Shielding	Fully shielded, 360° shielding contact
Benefits		Operating temperature range	-40 °C ... +70 °C
• Transmission of up to 100 Mbit/s		Colour	Green (PROFINET) Black (PROFINET Outdoor)
• Very robust RJ45 cord			
• Very large temperature range			
• Locking lever protection			
• PROFINET compliant			
• Useable as trailing cable (type C)			

Identification		Part number
HARTING RJ Industrial® system cable, angled, 4-wire Type A, angled top to angled bottom	Length 0.5 m	09 47 030 4001
	1.0 m	09 47 030 4002
	1.5 m	09 47 030 4003
	2.0 m	09 47 030 4004
	3.0 m	09 47 030 4005
	5.0 m	09 47 030 4007
HARTING RJ Industrial® system cable, angled, 4-wire Type B, angled top to angled bottom	Length 0.5 m	09 47 030 4023
	1.0 m	09 47 030 4024
	1.5 m	09 47 030 4025
	2.0 m	09 47 030 4026
	3.0 m	09 47 030 4027
	5.0 m	09 47 030 4029
HARTING RJ Industrial® system cable, angled, 4-wire Type C, angled top to angled bottom	Length 0.5 m	09 47 030 4045
	1.0 m	09 47 030 4046
	1.5 m	09 47 030 4047
	2.0 m	09 47 030 4048
	3.0 m	09 47 030 4049
	5.0 m	09 47 030 4051
HARTING RJ Industrial® system cable, angled, 4-wire Type B, outdoor, angled top to angled bottom	Length 0.5 m	09 47 030 4067
	1.0 m	09 47 030 4068
	1.5 m	09 47 030 4069
	2.0 m	09 47 030 4070
	3.0 m	09 47 030 4071
	5.0 m	09 47 030 4073

Other cable lengths on request



Exit left



Exit right



Exit top



Exit bottom

HARTING RJ Industrial®
system cable 4-wire, angled, Cat. 5

Features

- Connector types RJ45
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material PVC/PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- Locking lever protection
- PROFINET compliant
- Useable as trailing cable (type C)

Technical characteristics

- Connector types RJ45 overmoulded and locking lever protection
- Cable type 4 x AWG 22/7, Cat. 5, Star quad, double shielding
- Sheath material
Type B PVC
Type C PUR
- Wiring 4 pole, contacts 1/2 and 3/6
- Transmission performance Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -40 °C ... +70 °C
- Colour Green (PROFINET)
Black (PROFINET Outdoor)



Exit left



Exit right



Exit top



Exit bottom

HARTING RJ Industrial® system cable 4-wire, angled, Cat. 5

RJ45 cords

Identification		Part number			
		angled left	angled right	angled top	angled bottom
HARTING RJ Industrial® system cable, angled, 4-wire					
Type B, one side pre-assembled, second side open	Length 0.5 m	09 47 050 0023	09 47 060 0023	09 47 030 0023	09 47 040 0023
	1.0 m	09 47 050 0024	09 47 060 0024	09 47 030 0024	09 47 040 0024
	1.5 m	09 47 050 0025	09 47 060 0025	09 47 030 0025	09 47 040 0025
	2.0 m	09 47 050 0026	09 47 060 0026	09 47 030 0026	09 47 040 0026
	3.0 m	09 47 050 0027	09 47 060 0027	09 47 030 0027	09 47 040 0027
	5.0 m	09 47 050 0029	09 47 060 0029	09 47 030 0029	09 47 040 0029
HARTING RJ Industrial® system cable, angled, 4-wire					
Type C, one side pre-assembled, second side open	Length 0.5 m	09 47 050 0045	09 47 060 0045	09 47 030 0045	09 47 040 0045
	1.0 m	09 47 050 0046	09 47 060 0046	09 47 030 0046	09 47 040 0046
	1.5 m	09 47 050 0047	09 47 060 0047	09 47 030 0047	09 47 040 0047
	2.0 m	09 47 050 0048	09 47 060 0048	09 47 030 0048	09 47 040 0048
	3.0 m	09 47 050 0049	09 47 060 0049	09 47 030 0049	09 47 040 0049
	5.0 m	09 47 050 0051	09 47 060 0051	09 47 030 0051	09 47 040 0051
HARTING RJ Industrial® system cable, angled, 4-wire					
Type B, Outdoor one side pre-assembled, second side open	Length 0.5 m	09 47 050 0067	09 47 060 0067	09 47 030 0067	09 47 040 0067
	1.0 m	09 47 050 0068	09 47 060 0068	09 47 030 0068	09 47 040 0068
	1.5 m	09 47 050 0069	09 47 060 0069	09 47 030 0069	09 47 040 0069
	2.0 m	09 47 050 0070	09 47 060 0070	09 47 030 0070	09 47 040 0070
	3.0 m	09 47 050 0071	09 47 060 0071	09 47 030 0071	09 47 040 0071
	5.0 m	09 47 050 0073	09 47 060 0073	09 47 030 0073	09 47 040 0073



preLink®
system cable, 4-wire, straight, Cat. 5

Features

- Connector types RJ45 – preLink®
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- PROFINET compliant
- Useable as trailing cable (type C)
- The preLink® termination block can be terminated to all preLink® components like the RJ45 or the M12 X- and D-coded plugs and jacks

Technical characteristics

- Connector types RJ45 overmoulded and locking lever protection
- Cable type 4 x AWG 22/7, Cat. 5, Star quad, double shielding
- Sheath material PUR
- Wiring 4 pole, contacts 1/2 and 3/6
- Transmission performance Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -40 °C ... +70 °C
- Colour Green (PROFINET)

Identification

Part number

preLink®
system cable, 4-wire, straight

Length	0.2 m	20 82 631 1002
	0.4 m	20 82 631 1004
	0.6 m	20 82 631 1006
	0.8 m	20 82 631 1008
	1.0 m	20 82 631 1010
	2.0 m	20 82 631 1020
	3.0 m	20 82 631 1030
	4.0 m	20 82 631 1040
	5.0 m	20 82 631 1050
	10.0 m	20 82 631 1100

Other cable lengths on request



preLink®
system cable, 4-wire, straight, Cat. 5

RJ45 cords

Features

- Connector types preLink®
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- PROFINET compliant
- Useable as trailing cable (type C)
- The preLink® termination block can be terminated to all preLink® components like the RJ45 or the M12 X- and D-coded plugs and jacks

Technical characteristics

- Connector types RJ45 overmoulded and locking lever protection
- Cable type 4 x AWG 22/7, Cat. 5, Star quad, double shielding
- Sheath material PUR
- Wiring 4 pole, contacts 1/2 and 3/6
- Transmission performance Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -40 °C ... +70 °C
- Colour Green (PROFINET)

Identification

Part number

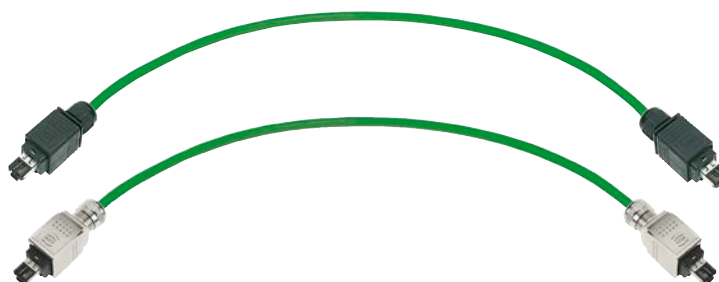
preLink®
system cable, 4-wire, straight

Length	0.2 m	20 82 630 2002
	0.4 m	20 82 630 2004
	0.6 m	20 82 630 2006
	0.8 m	20 82 630 2008
	1.0 m	20 82 630 2010
	2.0 m	20 82 630 2020
	3.0 m	20 82 630 2030
	4.0 m	20 82 630 2040
	5.0 m	20 82 630 2050
	10.0 m	20 82 630 2100

Other cable lengths on request



Han® PushPull RJ45
system cable, 4-wire, Cat. 5



Features

- Connector types Han® PushPull RJ45 (V14)
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material PVC/PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Standardised PushPull interface for IP65 / IP67
- Very space-saving
- AIDA compliant
- PROFINET compliant
- Useable as trailing cable (type C)
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

- Connector types Han® PushPull RJ45
- Cable type 4 x AWG 22/7, Cat. 5, Star quad, double shielding
- Sheath material
 - Type B PVC
 - Type C PUR
- Wiring 4 pole, contacts 1/2 and 3/6
- Transmission performance Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range
 - Type B -40 °C ... +70 °C
 - Type B outdoor -45 °C ... +60 °C
 - Type C -40 °C ... +70 °C
- Colour
 - Type B Green
 - Type B outdoor Black
 - Type C Green



Identification	Plastic version	Part number Metal version	Metal, overmoulded
Han® PushPull RJ45 system cable, 4-wire Type B			
Length 1.5 m	09 47 555 5033	09 47 565 6033	09 47 565 7033
3.0 m	09 47 555 5035	09 47 565 6035	09 47 565 7035
5.0 m	09 47 555 5037	09 47 565 6037	09 47 565 7037
10.0 m	09 47 555 5042	09 47 565 6042	09 47 565 7042
20.0 m	09 47 555 5044	09 47 565 6044	09 47 565 7044
Han® PushPull RJ45 system cable, 4-wire Type C			
Length 1.5 m	09 47 555 5063	09 47 565 6063	09 47 565 7063
3.0 m	09 47 555 5065	09 47 565 6065	09 47 565 7065
5.0 m	09 47 555 5067	09 47 565 6067	09 47 565 7067
10.0 m	09 47 555 5072	09 47 565 6072	09 47 565 7072
20.0 m	09 47 555 5074	09 47 565 6074	09 47 565 7074
Han® PushPull RJ45 system cable, 4-wire Type B, outdoor			
Length 1.5 m	09 47 555 5093	09 47 565 6093	09 47 565 7093
3.0 m	09 47 555 5095	09 47 565 6095	09 47 565 7095
5.0 m	09 47 555 5097	09 47 565 6097	09 47 565 7097
10.0 m	09 47 555 5102	09 47 565 6102	09 47 565 7102
20.0 m	09 47 555 5104	09 47 565 6104	09 47 565 7104

Other cable lengths on request



Han® 3 A RJ45
system cable, 4-wire, straight, Cat. 5

Features

• Connector types	Han® 3 A RJ45 metal (V5)
• Category	Cat. 5
• Number of wires	4
• Wiring	1:1
• Sheath material	PVC/PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Robust design
- Use on-site made possible by IP65 / IP67 protection
- Easy handling for all applications
- PROFINET compliant
- Useable as trailing cable (type C)

Technical characteristics

Connector types	Han® 3 A RJ45 metal
Cable type	4 x AWG 22/7, Cat. 5, Star quad, double shielding
Sheath material	
Type B	PVC
Type C	PUR
Wiring	4 pole, contacts 1/2 and 3/6
Transmission performance	Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
Data rate	10 Mbit/s, 100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	
Type B	-40 °C ... +70 °C
Type B outdoor	-45 °C ... +60 °C
Type C	-40 °C ... +70 °C
Colour	
Type B	Green
Type B outdoor	Black
Type C	Green

Identification		Part number	
Han® 3 A RJ45 system cable, 4-wire Type B	Length 1.5 m	09 45 715 1164	
	3.0 m	09 45 715 1166	
	5.0 m	09 45 715 1168	
	10.0 m	09 45 715 1173	
	20.0 m	09 45 715 1175	
Han® 3 A RJ45 system cable, 4-wire Type C	Length 1.5 m	09 45 715 0023	
	3.0 m	09 45 715 0025	
	5.0 m	09 45 715 0027	
	10.0 m	09 45 715 0051	
	20.0 m	09 45 715 0053	
Han® 3 A RJ45 system cable, 4-wire Type B, outdoor	Length 1.5 m	09 45 715 0064	
	3.0 m	09 45 715 0066	
	5.0 m	09 45 715 0068	
	10.0 m	09 45 715 0073	
	20.0 m	09 45 715 0075	

Other cable lengths on request



Han® 3 A RJ45
system cable, 4-wire, straight, Cat. 5

Features

- Connector types Han® 3 A RJ45 metal (V5) (IP65 / IP67) / RJ45 (IP20)
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material PVC/PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

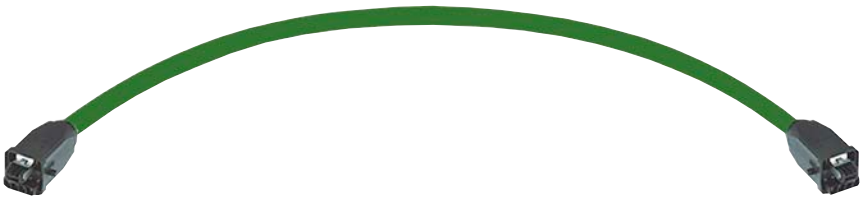
- Robust design
- Easy change-over from harsh industrial environment to protected IP20 environment
- Easy handling for all applications
- PROFINET compliant
- Useable as trailing cable (type C)

Technical characteristics

- Connector types Han® 3 A RJ45 metal (IP65 / IP67) / RJ45 (IP20)
- Cable type 4 x AWG 22/7, Cat. 5, Star quad, double shielding
- Sheath material
Type B PVC
Type C PUR
- Wiring 4 pole, contacts 1/2 and 3/6
- Transmission performance Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -40 °C ... +70 °C
- Colour Green

Identification		Part number	
Han® 3 A RJ45 system cable, 4-wire Type B			
	Length 1.5 m	09 45 700 1164	
	3.0 m	09 45 700 1166	
	5.0 m	09 45 700 1168	
	10.0 m	09 45 700 1173	
	20.0 m	09 45 700 1175	
Han® 3 A RJ45 system cable, 4-wire Type C			
	Length 1.5 m	09 45 700 0023	
	3.0 m	09 45 700 0025	
	5.0 m	09 45 700 0027	
	10.0 m	09 45 700 0051	
	20.0 m	09 45 700 0053	

Other cable lengths on request



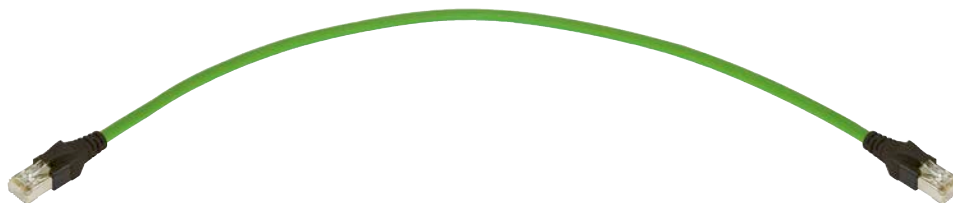
Han® 3 A RJ45 Hybrid system cable, 4-wire, straight, Cat. 5

Features		Technical characteristics	
• Connector types	Han® 3 A RJ45 Hybrid (V5) plastic/metal	Connector types	Han® 3 A RJ45 Hybrid, plastic/metal
• Category	Cat. 5	Cable type	4 x AWG 22/7, star quad, shielded + 4 x 1.5 mm² power cores
• Number of wires	4 (data) + 4 (power)	Sheath material	FRNC, halogen free
• Wiring	1:1	Wiring	4 pole, contacts 1/2 and 3/6
• Sheath material	FRNC, halogen free	Transmission performance	Category 5 class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
Application		Data rate	10 Mbit/s, 100 Mbit/s
• Industrial Cabling		Shielding	Fully shielded, 360° shielding contact
• Within switch cabinets		Operating temperature range	-20 °C ... +70 °C
• On machines and control units		Colour	Green
Benefits		Data power supply:	
• Robust design		Rated voltage	48 V/DC
• Use on-site made possible via IP65 / IP67 protection		Rated current	16 A
• Easy handling for applications with additional power supply			
• PROFINET compliant			

Identification		Part number	
Han® 3 A RJ45 Hybrid system cable, 4-wire, plastic	Length 1.5 m	09 45 725 1323	
	3.0 m	09 45 725 1325	
	5.0 m	09 45 725 1327	
	10.0 m	09 45 725 1351	
	20.0 m	09 45 725 1353	
Han® 3 A RJ45 Hybrid system cable, 4-wire, metal	Length 1.5 m	09 45 715 1364	
	3.0 m	09 45 715 1366	
	5.0 m	09 45 715 1368	
	10.0 m	09 45 715 1373	
	20.0 m	09 45 715 1375	

Other cable lengths on request

RJ45 cords



PROFINET cabinet cord Cat. 6A

Features

- Connector types RJ45
- Category Cat. 6A
- Number of wires 8
- Wiring 1:1
- Sheath material PVC

Application

- Industrial Cabling
- Within switch cabinets
- Within distribution cabinets on machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Very robust RJ45 cord
- Locking lever protection
- PROFINET compliant
- Reliable data transmission due to high EMC-immunity

Technical characteristics

- Connector types RJ45 overmoulded and locking lever protection
- Cable type S/FTP AWG 26/7, Cat. 6A
- Sheath material PVC
- Wiring 8 pole, 1:1, TIA/EIA-568-B
- Transmission performance Category 6A, Class EA up to 500 MHz according ISO/IEC 11801 and EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Coupling attenuation ≥ 80 dB (segregation class d)
- Characteristic impedance $100 \pm 5 \Omega$
- Lateral force 1000 N
- Bending radius Repeated bending ≥ 55 mm
Single bending ≥ 30 mm
- Operating temperature range $-20^\circ\text{C} \dots +70^\circ\text{C}$
- Flame retardant acc. IEC 60332-1-2

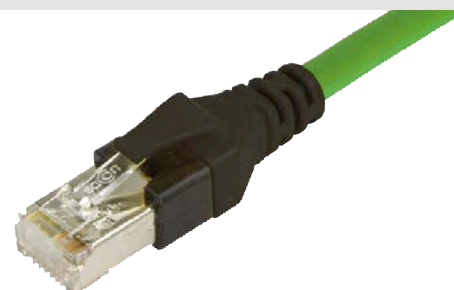
Identification

Part number

Drawing

PROFINET cabinet cord 8-wire

Length	0.3 m	09 48 474 7766 003
	0.5 m	09 48 474 7766 005
	1.0 m	09 48 474 7766 010
	1.5 m	09 48 474 7766 015
	2.0 m	09 48 474 7766 020
	3.0 m	09 48 474 7766 030
	5.0 m	09 48 474 7766 050





HARTING RJ Industrial®
patch cable, overmoulded, 8-wire, Cat. 5/Cat. 5e

Features

- Connector types RJ45
- Category Cat. 5/Cat. 5e
- Number of wires 8
- Wiring 1:1
- Sheath material PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

Benefits

- Robust industrial design
- Flexible, space saving
- Locking lever protection
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

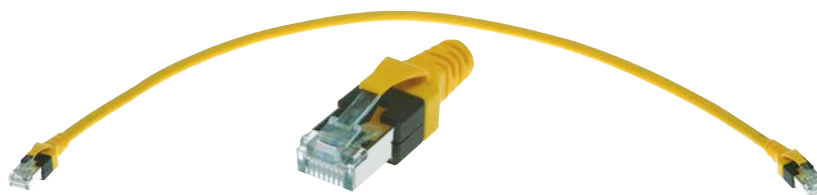
Technical characteristics

- Connector types RJ45, overmoulded, with locking lever protection
- Cable types 4 x 2, Twisted Pair, shielded, SF/UTP
- Sheath material PUR, halogen free LSZH
- Wiring 8 pole, 1:1
- Transmission performance Category 5/Category 5e, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range
 - fixed operation -30 °C ... +75 °C
 - flexible operation -5 °C ... +50 °C
- Colour Yellow

Identification		Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® patch cable, 8-wire, Cat. 5/Cat. 5e, overmoulded		Yellow		
Length	0.2 m	09 47 474 7001		
	0.3 m	09 47 474 7002		
	0.4 m	09 47 474 7003		
	0.5 m	09 47 474 7004		
	0.6 m	09 47 474 7005		
	0.7 m	09 47 474 7006		
	0.8 m	09 47 474 7007		
	0.9 m	09 47 474 7008		
	1.0 m	09 47 474 7009		
	1.5 m	09 47 474 7010		
	2.0 m	09 47 474 7011		
	2.5 m	09 47 474 7012		
	3.0 m	09 47 474 7013		
	4.0 m	09 47 474 7014		
	5.0 m	09 47 474 7015		
	6.0 m	09 47 474 7016		
	7.0 m	09 47 474 7017		
	7.5 m	09 47 474 7018		
	8.0 m	09 47 474 7019		
	9.0 m	09 47 474 7020		
	10.0 m	09 47 474 7021		
	15.0 m	09 47 474 7022		
	20.0 m	09 47 474 7023		
HARTING RJ Industrial® colour clips for HARTING RJ Industrial® connectors package with 10 pieces Colour:				
	Grey	09 45 870 0002		
	Yellow	09 45 870 0003		
	Orange	09 45 870 0006		
	Red	09 45 870 0007		
	Blue	09 45 870 0008		
	Green	09 45 870 0009		
	Black	09 45 870 0011		



Other cable lengths on request



HARTING RJ Industrial®
patch cable, overmoulded, 8-wire, Cat. 6A

Features

- Connector types RJ45
- Category Cat. 6
- Number of wires 8
- Wiring 1:1 and crossed
- Sheath material PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

Benefits

- Robust industrial design
- Flexible, space saving
- Locking lever protection
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

- Connector types RJ45, overmoulded, with locking lever protection
- Cable types 4 x 2, Twisted Pair, shielded, S/FTP
Category 7 acc. to IEC 61 156-6, EN 50288-4-2
- Sheath material PUR, halogen free LSZH
- Wiring 8 pole, 1:1 or crossed
- Transmission performance Category 6, Class E up to 250 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range
fixed operation -30 °C ... +75 °C
flexible operation -5 °C ... +50 °C
- Colour Yellow

Identification		Part number		Drawing	Dimensions in mm
HARTING RJ Industrial® patch cable, 8-wire, Cat. 6, overmoulded		Yellow 1:1	Yellow crossed		
Length	0.2 m	09 47 474 7101	09 47 474 7141		
	0.3 m	09 47 474 7102	09 47 474 7142		
	0.4 m	09 47 474 7103	09 47 474 7143		
	0.5 m	09 47 474 7104	09 47 474 7144		
	0.6 m	09 47 474 7105	09 47 474 7145		
	0.7 m	09 47 474 7106	09 47 474 7146		
	0.8 m	09 47 474 7107	09 47 474 7147		
	0.9 m	09 47 474 7108	09 47 474 7148		
	1.0 m	09 47 474 7109	09 47 474 7149		
	1.5 m	09 47 474 7110	09 47 474 7150		
	2.0 m	09 47 474 7111	09 47 474 7151		
	2.5 m	09 47 474 7112	09 47 474 7152		
	3.0 m	09 47 474 7113	09 47 474 7153		
	4.0 m	09 47 474 7114	09 47 474 7154		
	5.0 m	09 47 474 7115	09 47 474 7155		
	6.0 m	09 47 474 7116	09 47 474 7156		
	7.0 m	09 47 474 7117	09 47 474 7157		
	7.5 m	09 47 474 7118	09 47 474 7158		
	8.0 m	09 47 474 7119	09 47 474 7159		
	9.0 m	09 47 474 7120	09 47 474 7160		
	10.0 m	09 47 474 7121	09 47 474 7161		
	15.0 m	09 47 474 7122	09 47 474 7162		
	20.0 m	09 47 474 7123	09 47 474 7163		
HARTING RJ Industrial® colour clips for HARTING RJ Industrial® connectors package with 10 pieces Colour:					
	Grey	09 45 870 0002			
	Yellow	09 45 870 0003			
	Orange	09 45 870 0006			
	Red	09 45 870 0007			
	Blue	09 45 870 0008			
	Green	09 45 870 0009			
	Black	09 45 870 0011			
					



HARTING RJ Industrial®
patch cable, overmoulded, 8-wire, Cat. 6A

Features

- Connector types RJ45
- Category Cat. 6A
- Number of wires 8
- Wiring 1:1
- Sheath material FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

Benefits

- Robust industrial design
- Flexible, space saving
- Locking lever protection
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

- Connector types RJ45, overmoulded, with locking lever protection
- Cable types 4 x 2, Twisted Pair, shielded, S/FTP
Category 7 acc. to IEC 61 156-6, EN 50288-4-2
- Sheath material FRNC, halogen free
- Wiring 8 pole, 1:1 or crossed
- Transmission performance Category 6A,
Class EA up to 500 MHz
acc. to ISO/IEC 11801, EN 50173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s,
2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded,
360° shielding contact
- Operating temperature range 0 °C ... +60 °C
- Colour Yellow

Identification

HARTING RJ Industrial® patch cable, 8-wire

Length	0.15 m
	0.2 m
	0.25 m
	0.3 m
	0.4 m
	0.5 m
	0.6 m
	0.7 m
	0.8 m
	0.9 m
	1.0 m
	1.5 m
	2.0 m
	2.5 m
	3.0 m
	3.5 m
	4.0 m
	5.0 m
	7.5 m
	10.0 m

Part number

09 45 545 1500
09 45 545 1501
09 45 545 1519
09 45 545 1502
09 45 545 1503
09 45 545 1504
09 45 545 1505
09 45 545 1506
09 45 545 1507
09 45 545 1508
09 45 545 1509
09 45 545 1510
09 45 545 1511
09 45 545 1512
09 45 545 1513
09 45 545 1514
09 45 545 1515
09 45 545 1516
09 45 545 1517
09 45 545 1518

Other cable lengths on request



Patch cable RJ45 DualBoot®,
Cat. 5/Cat. 5e, shielded

Features

- Connector types RJ45
- Category Cat. 5/Cat. 5e
- Number of wires 8
- Wiring 1:1
- Sheath material FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- In IT networks

Benefits

- Flexible, space saving
- Different colours, characterization of services
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

- Connector types RJ45 with DualBoot®
- Cable type 4x2 Twisted Pair, screened SF-UTP
- Sheath material FRNC, halogen free
- Wiring 8 pole, 1:1
- Transmission performance Category 5/Category 5e, Class D up to 100 MHz according ISO/IEC 11801 and EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range 0 °C ... +60 °C
- Lengths All lengths available in 10 cm steps
- Lengths key xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
- Colour Grey, red, yellow, green, blue

Identification

Patch cable Cat. 5/Cat. 5e DualBoot® 1:1

grey
red
yellow
green
blue

Part number

09 48 868 6569 xxx
09 48 868 6570 xxx
09 48 868 6571 xxx
09 48 868 6572 xxx
09 48 868 6573 xxx



Patch cable RJ45 DualBoot®,
Cat. 6_A, shielded

Features

- Connector types RJ45
- Category Cat. 6_A
- Number of wires 8
- Wiring 1:1
- Sheath material FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- In IT networks

Benefits

- Transmission of up to 10 Gbit/s
- Flexible, space saving
- Different colours, characterization of services
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

- Connector types RJ45 with DualBoot®
- Cable type 4x2 Twisted Pair, screened SF-STP
- Sheath material FRNC, halogen free
- Wiring 8 pole, 1:1
- Transmission performance Category 6_A, Class E_A up to 500 MHz according ISO/IEC 11801 and EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range 0 °C ... +60 °C
- Lengths All lengths available in 10 cm steps
- Lengths key xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
- Colour White, grey, red, yellow, green, blue, black

Identification

Patch cable Cat. 6_A DualBoot® 1:1

white
grey
red
yellow
green
blue
black

Part number

09 48 878 7584 xxx
09 48 878 7585 xxx
09 48 878 7586 xxx
09 48 878 7587 xxx
09 48 878 7588 xxx
09 48 878 7589 xxx
09 48 878 7590 xxx



PushPull patch cable RJ45 DualBoot®,
Cat. 5/Cat. 5e, shielded

Features

- Connector types RJ45 with PushPull locker
- Category Cat. 5/Cat. 5e
- Number of wires 8
- Wiring 1:1
- Sheath material FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- In IT networks

Benefits

- PushPull locking mechanism
- Different colours, characterization of services
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

- Connector types RJ45 with DualBoot® and PushPull locker
- Cable type 4x2 Twisted Pair, screened SF-STP
- Sheath material FRNC, halogen free
- Wiring 8 pole, 1:1
- Transmission performance Category 5, Class D up to 100 MHz according ISO/IEC 11801 and EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range 0 °C ... +60 °C
- Lengths All lengths available in 10 cm steps
- Lengths key xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
- Colour Grey, red, yellow, green, blue, orange

Identification

PushPull patch cable Cat. 5/Cat. 5e DualBoot® 1:1
grey
red
yellow
green
blue
orange

Part number

09 48 898 9595 xxx
09 48 898 9596 xxx
09 48 898 9597 xxx
09 48 898 9594 xxx
09 48 898 9598 xxx
09 48 898 9593 xxx



PushPull patch cable RJ45 DualBoot® Cat. 6_A, shielded

Features

- Connector types RJ45 with PushPull locker
- Category Cat. 6_A
- Number of wires 8
- Wiring 1:1
- Sheath material FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- In IT networks

Benefits

- Transmission of up to 10 Gbit/s
- PushPull locking mechanism
- Different colours, characterization of services
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

- Connector types RJ45 with DualBoot® and PushPull locker
- Cable type 4x2 Twisted Pair, screened SF-STP
- Sheath material FRNC, halogen free
- Wiring 8 pole, 1:1
- Transmission performance Category 6_A, Class E_A up to 500 MHz according ISO/IEC 11801 and EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range 0 °C ... +60 °C
- Lengths All lengths available in 10 cm steps
- Lengths key xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
- Colour White, black, grey, red, yellow, green, blue, orange

Identification

PushPull patch cable Cat. 6_A DualBoot® 1:1

white
black
grey
red
yellow
green
blue
orange

Part number

09 48 888 8574 xxx
09 48 888 8575 xxx
09 48 888 8576 xxx
09 48 888 8577 xxx
09 48 888 8578 xxx
09 48 888 8579 xxx
09 48 888 8580 xxx
09 48 888 8592 xxx



HARTING VarioBoot® RJ45 System Cable – small, manoeuvrable and space-saving

RJ45 cords

Features

- Up to Cat. 6_A 10 Gbit/s transmission
- Over-moulded angled RJ45 connector with locking – lever protection
- Adaptable and changeable cable outlet
- Small design helps save significant space
- One RJ45 system cable for all outlet directions



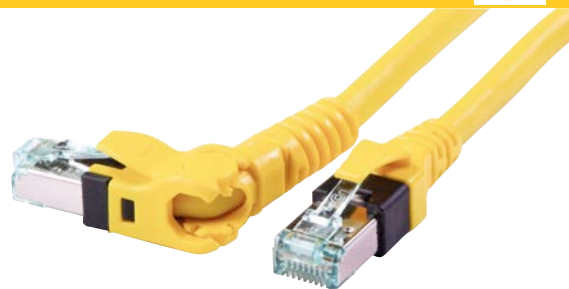
Technical characteristics

Connector types	RJ45 with DualBoot®
Cable type	4x2 Twisted Pair, screened SF-STP
Sheath material	FRNC, halogen free
Wiring	8 pole, 1:1
Transmission performance	Category 6 _A , Class E _A up to 500 MHz according ISO/IEC 11801 and EN 50 173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	0 °C ... +60 °C
Lengths	All lengths available in 10 cm steps
Lengths key	xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
Colour	White, grey, red, yellow, green, blue, black

Identification

Part number

Colour		VarioBoot® RJ45 – VarioBoot® RJ45	VarioBoot® RJ45 – DualBoot® RJ45	VarioBoot® RJ45 Orientation pre-mounted
FRNC Cable				
	Grey	09 48 858 5585 xxx	09 48 858 7585 xxx	left and right
	Red	09 48 858 5586 xxx	09 48 858 7586 xxx	left and right
	Yellow	09 48 858 5587 xxx	09 48 858 7587 xxx	left and right
	Green	09 48 858 5588 xxx	09 48 858 7588 xxx	left and right
	Blue	09 48 858 5589 xxx	09 48 858 7589 xxx	left and right
xxx: Cable length	005 = 0.5 m			
	010 = 1.0 m			
	015 = 1.5 m			
	020 = 2.0 m			
	025 = 2.5 m			
	030 = 3.0 m			
	050 = 5.0 m			
	075 = 7.5 m			
	100 = 10 m			
	150 = 15 m			
	200 = 20 m			



HARTING VarioBoot® RJ45 System Cable –
small, manoeuvrable and space-saving

Features

- Up to Cat. 6_A 10 Gbit/s transmission
- Over-moulded angled RJ45 connector with locking – lever protection
- Adaptable and changeable cable outlet
- Small design helps save significant space
- One RJ45 system cable for all outlet directions



Technical characteristics

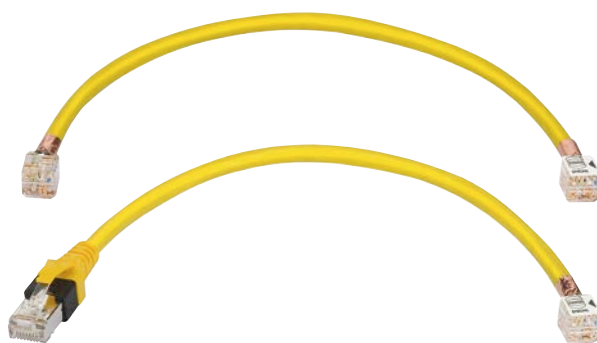
Number of wires	8
Wire design	4x 2 Twisted Pair
Connector 1	HARTING VarioBoot RJ45, preferred directions up/down
Connector 2	HARTING VarioBoot RJ45, preferred directions up/down
Limiting temperature	-30 ... +75 °C fix operation, -5 ... +50 °C flexible operation
Degree of protection IEC 60529	IP20
Transmission performance	Cat. 6 _A , Class E _A to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 10 Gbit/s
Material	PUR (polyurethane)
Colour	Yellow

Identification

Part number

Colour		VarioBoot® RJ45 – VarioBoot® RJ45	VarioBoot® RJ45 – DualBoot® RJ45	VarioBoot® RJ45 Orientation pre-mounted
PUR Cable	Yellow	09 48 848 4745 xxx	09 48 844 7745 xxx	up and down
	Yellow	09 48 858 5745 xxx	09 48 854 7745 xxx	left and right
	Yellow	09 48 848 5745 xxx		up and down / left and right
xxx: Cable length	005 = 0.5 m 010 = 1.0 m 015 = 1.5 m 020 = 2.0 m 025 = 2.5 m 030 = 3.0 m 050 = 5.0 m 075 = 7.5 m 100 = 10 m 150 = 15 m 200 = 20 m			

preLink®
patch cable, overmoulded, 8-wire, Cat. 6A



Features

- Connector types RJ45 – preLink®
- Category Cat. 6A
- Number of wires 8
- Wiring 1:1 and crossed
- Sheath material PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

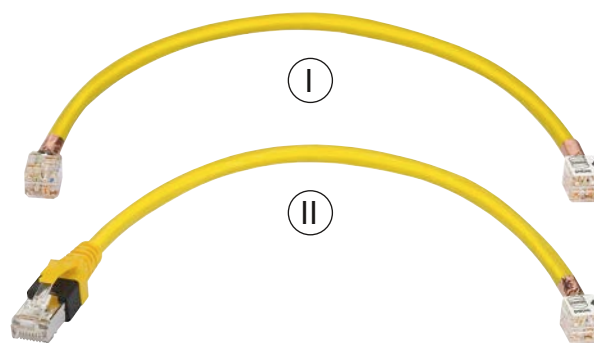
Benefits

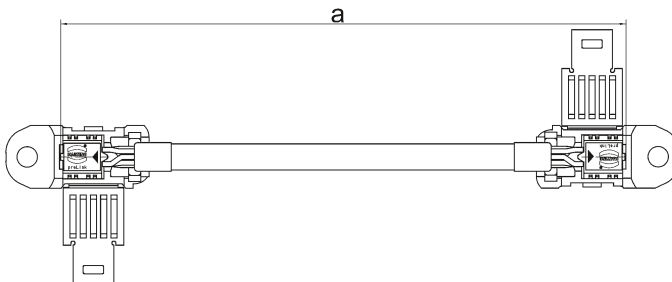
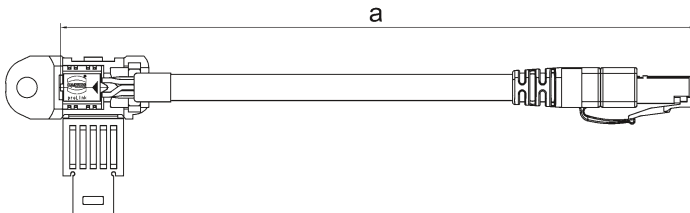
- Pre-assembled system cable
- Fast, flexible and reliable in the application
- Simple in handling
- Robust in design
- Installation of preLink® cables for industrial environment
- Connection cable for control or distributor cabinets or within controllers
- The preLink® termination block can be terminated to all preLink® components like the RJ45 or the M12 X- and D-coded plugs and jacks

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 6A, Class EA up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1 |
| Data rate | 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s |
| Shielding | Copper braid, tinned |
| Operating temperature range | |
| fixed operation | -35 °C ... +70 °C |
| flexible operation | -5 °C ... +50 °C |
| Colour | Yellow |

preLink®
patch cable, overmoulded, 8-wire, Cat. 6A



Identification			Part number	Drawing	Dimensions in mm
preLink® patch cable			Yellow		
I	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		
		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		
II	Side 1 with terminal module, secured by protection cap	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		
		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		
Side 2 RJ45 overmoulded, with locking lever protection					

Other cable lengths on request



HARTING ix Industrial®
cable assemblies type A



Features

- Connector types HARTING ix Industrial®
- Category Cat. 6A
- Number of wires 8
- Wiring 1:1
- Sheath material Pvc

Application

- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

Benefits

- Miniaturised Ethernet data interface suitable for industry in acc. to IEC 61076-3-124 type A
- Robust industrial design
- 360° shielding
- Category of transmission Cat. 6A
- 5000 mating cycles
- Flexible, space saving
- Suitable for all PoE versions

Technical characteristics

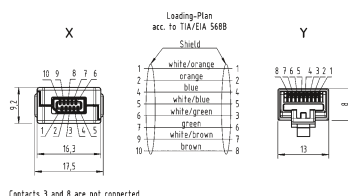
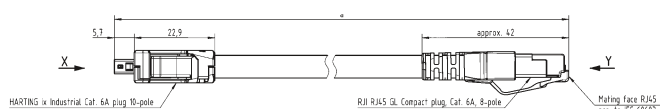
- Cable types 4 x 2 x AWG 28/7
- Sheath material PVC
- Wiring TIA/EIA 568B, 1:1
- Transmission performance Category 6A,
Class EA up to 500 MHz
acc. to ISO/IEC 61076-3-124
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s,
2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Copper braid, tinned
- Operating temperature range -40 °C ... +80 °C
- Colour Yellow
- RoHS compliant



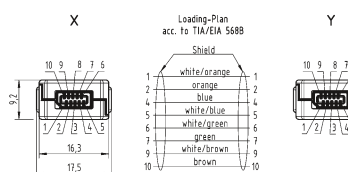
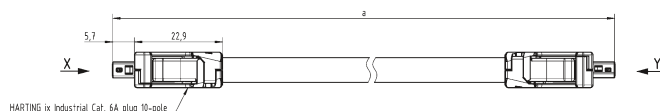
HARTING ix Industrial® cable assemblies type A



Identification	Part number	Drawing	Dimensions in mm
HARTING ix Industrial® cable assemblies Connector 1: HARTING ix Industrial® Connector 2: RJ45, AWG28, KAT6A, PVC			
Length a			
0.2 m	33 48 065 3830 002		
0.3 m	33 48 065 3830 003		
0.4 m	33 48 065 3830 004		
0.5 m	33 48 065 3830 005		
0.6 m	33 48 065 3830 006		
0.7 m	33 48 065 3830 007		
0.8 m	33 48 065 3830 008		
0.9 m	33 48 065 3830 009		
1.0 m	33 48 065 3830 010		
1.5 m	33 48 065 3830 015		
2.0 m	33 48 065 3830 020		
2.5 m	33 48 065 3830 025		
3.0 m	33 48 065 3830 030		
5.0 m	33 48 065 3830 050		
7.5 m	33 48 065 3830 075		
10.0 m	33 48 065 3830 100		
15.0 m	33 48 065 3830 150		
20.0 m	33 48 065 3830 200		
HARTING ix Industrial® cable assemblies Connector 1 and 2: HARTING ix Industrial® RJ45, AWG28, KAT6A, PVC			
Length a			
0.2 m	33 48 060 6830 002		
0.3 m	33 48 060 6830 003		
0.4 m	33 48 060 6830 004		
0.5 m	33 48 060 6830 005		
0.6 m	33 48 060 6830 006		
0.7 m	33 48 060 6830 007		
0.8 m	33 48 060 6830 008		
0.9 m	33 48 060 6830 009		
1.0 m	33 48 060 6830 010		
1.5 m	33 48 060 6830 015		
2.0 m	33 48 060 6830 020		
2.5 m	33 48 060 6830 025		
3.0 m	33 48 060 6830 030		
5.0 m	33 48 060 6830 050		
7.5 m	33 48 060 6830 075		
10.0 m	33 48 060 6830 100		
15.0 m	33 48 060 6830 150		
20.0 m	33 48 060 6830 200		



Contacts 3 and 8 are not connected



Contacts 3 and 8 are not connected on both sides



Han® PushPull RJ45
system cable, 8-wire, Cat. 6A

Features

• Connector types	Han® PushPull RJ45 (V14)
• Category	Cat. 6A
• Number of wires	8
• Wiring	1:1
• Sheath material	PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Standardised PushPull interface for IP65 / IP67
- Especially space-saving
- AIDA compliant
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

Connector types	Han® PushPull RJ45
Cable type	4 x 2, Twisted Pair, shielded
Sheath material	PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6A, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50 173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C ... +70 °C
Colour	Green/Yellow

Identification	Plastic	Part number Metal	Metal
Han® PushPull RJ45 system cable, 8-wire	Yellow	Yellow	PROFINET Green
Length 1.5 m	09 47 575 7001	09 47 585 8001	09 48 171 7165 015
3.0 m	09 47 575 7002	09 47 585 8002	09 48 171 7165 030
5.0 m	09 47 575 7003	09 47 585 8003	09 48 171 7165 050
10.0 m	09 47 575 7004	09 47 585 8004	09 48 171 7165 100
20.0 m	09 47 575 7005	09 47 585 8005	09 48 171 7165 200

Other cable lengths on request



Han® 3 A RJ45
system cable, 8-wire, Cat. 6A

Features

- Connector types Han® 3 A RJ45 (V5)
- Category Cat. 6A
- Number of wires 8
- Wiring 1:1
- Sheath material PVC/PUR

Application

- Industrial Cabling
- Between I/O and controllers
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Very robust RJ45 cord
- Complete IP65 / IP67 rated
- ISO/IEC 11801 compliant

Technical characteristics

- Connector types Han® 3 A RJ45
- Cable types 4 x 2, Twisted Pair, shielded
- Sheath material PVC/PUR
- Wiring 8 pole, 1:1
- Transmission performance Category 6A, Class E_A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -10 °C ... +70 °C
- Colour Yellow

Identification	Part number		Drawing	Dimensions in mm
	PVC	PUR		
Han® 3 A RJ45 system cable, 8-wire	Yellow	Yellow		
Length 1.5 m	09 45 715 1523	09 45 715 1563		
3.0 m	09 45 715 1525	09 45 715 1565		
5.0 m	09 45 715 1527	09 45 715 1567		
10.0 m	09 45 715 1551	09 45 715 1572		
20.0 m	09 45 715 1553	09 45 715 1574		

Other cable lengths on request



Han® 3 A RJ45
system cable, 8-wire, Cat. 6A

Features

• Connector types	Han® 3 A RJ45 (V5)/RJ45 IP20
• Category	Cat. 6A
• Number of wires	8
• Wiring	1:1
• Sheath material	PVC/PUR

Application

- Industrial Cabling
- Connection between generic cabling and machine cabling
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Very robust RJ45 cord
- Single sided IP65 / IP67 rated
- ISO/IEC 11801 compliant
- PROFINET compliant

Technical characteristics

Connector types	Han® 3 A RJ45 (IP65 / IP67) RJ45 (IP20)
Cable types	4 x 2, Twisted Pair, shielded
Sheath material	PVC/PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6A, Class EA up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C to +70 °C
Colour	Yellow

Identification	Part number		Drawing	Dimensions in mm
	PVC	PUR		
Han® 3 A RJ45 system cable, 8-wire IP65 / IP67 to IP20	Yellow	Yellow		
Length 1.5 m	09 45 701 1564	09 45 701 1534		
3.0 m	09 45 701 1566	09 45 701 1536		
5.0 m	09 45 701 1568	09 45 701 1538		
10.0 m	09 45 701 1573	09 45 701 1543		
20.0 m	09 45 701 1575	09 45 701 1545		

Other cable lengths on request



Han® 3 A RJ45 Hybrid
system cable, 8-wire, Outdoor, plastic, Cat. 6A

Features

• Connector types	Han® 3 A RJ45 (V5) Hybrid, plastic
• Category	Cat. 6A
• Number of wires	8 (data) + 4 (power)
• Wiring	1:1
• Sheath material	PUR

Application

- Industrial Cabling
- Connection between generic cabling and machine cabling
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Use on-site made possible via IP65 / IP67 protection
- Easy handling for applications with additional power supply
- PROFINET compliant

Technical characteristics

Connector types	Han® 3 A RJ45 Hybrid, plastic
Cable types	4 x 2, Twisted Pair, shielded + 4 x 1.5 power cores
Sheath material	PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6A, Class E up to 500 MHz according to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C ... +70 °C
Colour	Black
Data power supply	
Rated voltage	48 V/DC
Rated current	16 A

Identification	Part number PUR	Drawing	Dimensions in mm
Han® 3 A RJ45 Hybrid system cable, 8-wire	Black		
Length	1.5 m	09 45 725 1503	
	3.0 m	09 45 725 1505	
	5.0 m	09 45 725 1507	
	10.0 m	09 45 725 1512	
	20.0 m	09 45 725 1514	

Other cable lengths on request



Han® 3 A RJ45 Hybrid
system cable, 8-wire, Outdoor, metal, Cat. 6_A

Features

• Connector types	Han® 3 A RJ45 (V5) Hybrid, metal
• Category	Cat. 6 _A
• Number of wires	8 (data) + 4 (power)
• Wiring	1:1
• Sheath material	PUR

Application

- Industrial Cabling
- Connection between generic cabling and machine cabling
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Use on-site made possible via IP65 / IP67 protection
- Easy handling for applications with additional power supply
- PROFINET compliant

Technical characteristics

Connector types	Han® 3 A RJ45 Hybrid, metal
Cable types	4 x 2, Twisted Pair, shielded + 4 x 1.5 mm ² power cores
Sheath material	PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6 _A , Class E up to 500 MHz according to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C ... +70 °C
Colour	Black
Data power supply	
Rated voltage	48 V/DC
Rated current	16 A

Identification	Part number PUR	Drawing	Dimensions in mm
Han® 3 A RJ45 Hybrid system cable, 8-wire Outdoor	Black		
Length			
1.5 m	09 45 725 1533		
3.0 m	09 45 725 1535		
5.0 m	09 45 725 1537		
10.0 m	09 45 725 1542		
20.0 m	09 45 725 1544		

Other cable lengths on request



HARTING PushPull RJ45
system cable, 8-wire, straight, Cat. 6A

Features

- Connector types HARTING PushPull RJ45 (V4)
- Category Cat. 6A
- Number of wires 8
- Wiring 1:1

Application

- Industrial Cabling
- Outdoor
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Double-sided IP65 / IP67 protection
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

- Connector types HARTING PushPull RJ45
- Cable type 4 x 2 x AWG 26/7, Cat. 6A
- Wiring 8 pole, 1:1
- Transmission performance Category 6A, Class E up to 500 MHz according to ISO/IEC 11801, EN 50173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range
 - PUR -40 °C ... +80 °C
 - PVC -20 °C ... +80 °C
 - Outdoor -20 °C ... +80 °C
- Colour Yellow, black

Identification		PUR	Part number PVC	Outdoor
HARTING PushPull RJ45 system cable, 8-wire		Yellow	Yellow	Black
Length	0.5 m	09 48 282 8756 005	09 48 282 8757 005	09 48 282 8758 005
	1.0 m	09 48 282 8756 010	09 48 282 8757 010	09 48 282 8758 010
	5.0 m	09 48 282 8756 050	09 48 282 8757 050	09 48 282 8758 050
	7.5 m	09 48 282 8756 075	09 48 282 8757 075	09 48 282 8758 075
	10.0 m	09 48 282 8756 100	09 48 282 8757 100	09 48 282 8758 100
	15.0 m	09 48 282 8756 150	09 48 282 8757 150	09 48 282 8758 150
	20.0 m	09 48 282 8756 200	09 48 282 8757 200	09 48 282 8758 200

Other cable lengths on request



HARTING PushPull RJ45
system cable, 8-wire, straight, Cat. 6A

Features

- Connector types HARTING PushPull (V4) RJ45/RJ45 IP20
- Category Cat. 6A
- Number of wires 8
- Wiring 1:1

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Easy interface between hard industrial areas to the protected IP20 environment
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

- Connector types HARTING PushPull RJ45 (IP65 / IP67) RJ45 (IP20)
- Cable type S/FTP AWG 22/7, Cat. 6A
- Wiring 8 pole, 1:1
- Transmission performance Category 6A, Class E up to 500 MHz according to ISO/IEC 11 801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -20 °C ... +75 °C
- Colour Yellow, black

Identification		PUR	Part number PVC	Outdoor
HARTING PushPull RJ45 system cable, 8-wire IP65 / IP67 on IP20		Yellow	Yellow	Black
Length	1.0 m	09 48 284 7756 010	09 48 284 7757 010	09 48 284 7758 010
	2.0 m	09 48 284 7756 020	09 48 284 7757 020	09 48 284 7758 020
	3.0 m	09 48 284 7756 030	09 48 284 7757 030	09 48 284 7758 030
	5.0 m	09 48 284 7756 050	09 48 284 7757 050	09 48 284 7758 050
	7.0 m	09 48 284 7756 070	09 48 284 7757 070	09 48 284 7758 070
	10.0 m	09 48 284 7756 100	09 48 284 7757 100	09 48 284 7758 100
	15.0 m	09 48 284 7756 150	09 48 284 7757 150	09 48 284 7758 150
	20.0 m	09 48 284 7756 200	09 48 284 7757 200	09 48 284 7758 200

Other cable lengths on request



HARTING PushPull RJ45
system cable, 8-wire, straight, Cat. 6A

Features

- Connector types HARTING PushPull RJ45 (V4)
- Category Cat. 6A
- Number of wires 8
- Wiring 1:1
- Sheath material PUR

Application

- Industrial Cabling
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Double-sided IP65 / IP67 protection
- Very large temperature range
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

- Connector types HARTING PushPull RJ45 female and male
- Cable type S/FTP AWG 26/7, Cat. 6A
- Sheath material PUR
- Wiring 8 pole, 1:1
- Transmission performance Category 6A, Class E up to 500 MHz according to ISO/IEC 11801, EN 50173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -35 °C ... +70 °C
- Colour Yellow

Identification		Part number PUR	Drawing	Dimensions in mm
HARTING PushPull RJ45 system cable, 8-wire		Yellow		
Length	0.5 m	33 45 232 0050 003		
	1.0 m	33 45 232 0100 003		
	2.0 m	33 45 232 0200 003		
	3.0 m	33 45 232 0300 003		
	5.0 m	33 45 232 0500 003		
	7.5 m	33 45 232 0750 003		
	10.0 m	33 45 232 1000 003		

Other cable lengths on request



HARTING M12
system cable, 4-wire,
straight resp. angled, Cat. 5



Features

- Connector types M12 D-coding connector and female, straight and angled
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material PVC/PUR

Application

- For harsh industrial environments
- On machines and control units
- PROFINET transmission

Benefits

- Robust design
- Use on-site made possible by IP65 / IP67 protection
- PUR variants are useable as trailing cables and oil proof

Technical characteristics

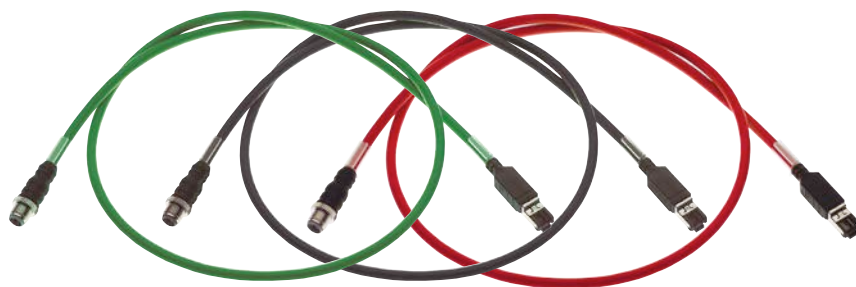
- Connector types HARTING M12 D-coding, overmoulded
- Cable types 4 x AWG 22/7, Cat. 5, Star quad, double shielding
- Sheath material PVC/PUR
- Wiring 4 pole, 1:1
- Transmission performance Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -25 °C ... +70 °C
- Colour Green



HARTING M12
system cable, 4-wire,
straight resp. angled, Cat. 5



Identification			Part number	
			PUR	PVC
both sides assembled connector straight to connector straight	Length	0.5 m	21 34 929 2477 005	21 34 929 2405 005
		1.0 m	21 34 929 2477 010	21 34 929 2405 010
		1.5 m	21 34 929 2477 015	21 34 929 2405 015
		2.0 m	21 34 929 2477 020	21 34 929 2405 020
		5.0 m	21 34 929 2477 050	21 34 929 2405 050
		7.5 m	21 34 929 2477 075	21 34 929 2405 075
		10.0 m	21 34 929 2477 100	21 34 929 2405 100
both sides assembled connector straight to female angled	Length	0.5 m	21 34 929 3477 005	21 34 929 3405 005
		1.0 m	21 34 929 3477 010	21 34 929 3405 010
		1.5 m	21 34 929 3477 015	21 34 929 3405 015
		2.0 m	21 34 929 3477 020	21 34 929 3405 020
		5.0 m	21 34 929 3477 050	21 34 929 3405 050
		7.5 m	21 34 929 3477 075	21 34 929 3405 075
		10.0 m	21 34 929 3477 100	21 34 929 3405 100
one side assembled connector straight to open end	Length	0.5 m	21 34 920 0477 005	21 34 920 0405 005
		1.0 m	21 34 920 0477 010	21 34 920 0405 010
		1.5 m	21 34 920 0477 015	21 34 920 0405 015
		2.0 m	21 34 920 0477 020	21 34 920 0405 020
		5.0 m	21 34 920 0477 050	21 34 920 0405 050
		7.5 m	21 34 920 0477 075	21 34 920 0405 075
		10.0 m	21 34 920 0477 100	21 34 920 0405 100
one side assembled female straight to open end	Length	0.5 m	21 34 930 0477 005	21 34 930 0405 005
		1.0 m	21 34 930 0477 010	21 34 930 0405 010
		1.5 m	21 34 930 0477 015	21 34 930 0405 015
		2.0 m	21 34 930 0477 020	21 34 930 0405 020
		5.0 m	21 34 930 0477 050	21 34 930 0405 050
		7.5 m	21 34 930 0477 075	21 34 930 0405 075
		10.0 m	21 34 930 0477 100	21 34 930 0405 100
both sides assembled connector angled to connector angled	Length	0.5 m	21 34 949 4477 005	21 34 949 4405 005
		1.0 m	21 34 949 4477 010	21 34 949 4405 010
		1.5 m	21 34 949 4477 015	21 34 949 4405 015
		2.0 m	21 34 949 4477 020	21 34 949 4405 020
		5.0 m	21 34 949 4477 050	21 34 949 4405 050
		7.5 m	21 34 949 4477 075	21 34 949 4405 075
		10.0 m	21 34 949 4477 100	21 34 949 4405 100



HARTING M12/RJ45
system cable, 4-wire, Cat. 5

Features

- Connector types M12 D-coding - RJ45
- Category Cat. 5
- Number of wires 4
- Wiring See technical characteristics
- Sheath material PVC/PUR

Application

- Industrial cabling
- On machines and control units
- PROFINET transmission

Benefits

- Robust design
- Useable as trailing cable (type C)
- Overmoulded connectors

Technical characteristics

- Connector types HARTING M12 D-coding, overmoulded (IP65 / IP67)
RJ45 4 pole, contacts 1/2 and 3/6, overmoulded (IP20)
- Cable types 4 x AWG 22/7, Cat. 5, Star quad, double shielding
- Sheath material PVC/PUR
- Wiring 4 pole
- Transmission performance Cat. 5e, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -30 °C ... +70 °C
- Colour Green/Black
Red (SERCOS III)
- Contact assignment

	M12 D-coding	RJ45
Signal		
TD+	1	1
TD-	3	2
RD+	2	3
RD-	4	6

Identification		PUR	Part number PVC	SERCOS III PUR
HARTING M12/RJ45 system cable, 4-wire		Green	Black	Red
Length	1.0 m	09 45 700 5022	09 45 700 5063	09 47 220 2003 018
	3.0 m	09 45 700 5025	09 45 700 5066	09 47 220 2005 018
	5.0 m	09 45 700 5027	09 45 700 5068	09 47 220 2007 018
	10.0 m	09 45 700 5051	09 45 700 5073	09 47 220 2012 018
	20.0 m	09 45 700 5053	09 45 700 5075	09 47 220 2014 018

Other cable lengths on request



Press & Go M12
system cable, 8-wire, Cat. 6_A



Features

- Connector types M12 X-coding
- Category Cat. 6_A
- Number of wires 8
- Wiring 1:1
- Sheath material PVC/PUR

Application

- Industrial cabling IP65 / IP67
- Transmission up to 10 Gbit/s
- Camera systems

Benefits

- Very robust metal housing M12 with degree of protection IP65 / IP67
- Vibration proof crimp connection
- Maximum data rates through the configuration of the contacts in conformance with Ethernet technology
- Minimal interaction and perfect shielding through paired shielding of the contacts
- Fault proof connection through coding of the connector face. A connection error with other 8 pole M12's is impossible
- PROFINET compliant Type X mating face
- Oil proof acc. to EN 60811-2-1 (PUR)

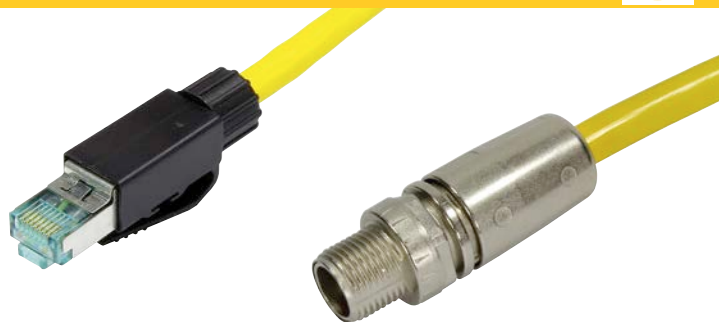
Technical characteristics

- | | |
|-----------------------------|--|
| Connector types | Press & Go M12 connector
X coding acc. to IEC 61076-2-109 |
| Cable types | PVC: 4 x 2 x AWG 26/7, cat. 6 _A ,
S/FTP, shielded
PUR: 4 x 2 x AWG 26/7, cat. 7,
S/FTP, shielded |
| Sheath material | PVC/PUR |
| Wiring | 8 pole, 1:1 |
| Transmission performance | Category 6 _A ,
Class E _A up to 500 MHz
acc. to ISO/IEC 11801,
EN 50173-1 |
| Data rate | 10 Mbit/s, 100 Mbit/s, 1 Gbit/s,
2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s |
| Shielding | Fully shielded,
360° shielding contact |
| Operating temperature range | -40 °C ... +70 °C |
| Colour | Yellow |



Press & Go M12
system cable, 8-wire, Cat. 6_A

Identification		Part number	
		PUR	PVC
Press & Go M12 system cable, 8-wire one side assembled			
Length	1.0 m	21 33 050 0850 010	21 33 050 0855 010
	2.0 m	21 33 050 0850 020	21 33 050 0855 020
	3.0 m	21 33 050 0850 030	21 33 050 0855 030
	5.0 m	21 33 050 0850 050	21 33 050 0855 050
	10.0 m	21 33 050 0850 100	21 33 050 0855 100
both sides assembled			
Length	1.0 m	21 33 050 5850 010	21 33 050 5855 010
	2.0 m	21 33 050 5850 020	21 33 050 5855 020
	3.0 m	21 33 050 5850 030	21 33 050 5855 030
	5.0 m	21 33 050 5850 050	21 33 050 5855 050
	10.0 m	21 33 050 5850 100	21 33 050 5855 100



M12/RJ45
system cable, 8-wire, Cat. 6_A

Features

- Connector types M12 X-coding to RJ45
- Category Cat. 6_A
- Number of wires 8
- Wiring 1:1
- Sheath material PVC/PUR

Application

- Industrial cabling IP65 / IP67
- Transmission up to 10 Gbit/s
- Camera systems

Benefits

- Very robust metal housing M12 with degree of protection IP65
- Vibration proof crimp connection
- Maximum data rates through the configuration of the contacts in conformance with Ethernet technology
- Minimal interaction and perfect shielding through paired shielding of the contacts
- Fault proof connection through coding of the connector face. A connection error with other 8 pole M12's is impossible
- PROFINET compliant Type X mating face

Technical characteristics

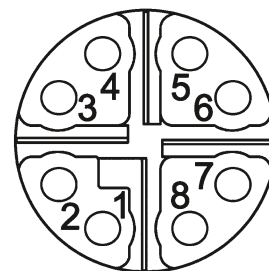
- Connector types *har*-speed M12 connector X coding acc. to IEC 61076-2-109 and RJ45 Gigalink
- Cable types 4 x 2 x AWG 26/7, cat. 6_A, S/FTP, shielded
- Sheath material PVC/PUR
- Wiring 8 pole, 1:1
- Transmission performance Category 6_A, Class E_A up to 500 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range -40 °C ... +70 °C
- Colour Yellow

Identification		Part number	
		PUR	PVC
M12/RJ45 system cable, 8-wire		Yellow	Yellow
Length	0.5 m	09 48 932 3756 005	09 48 932 3757 005
	1.0 m	09 48 932 3756 010	09 48 932 3757 010
	1.5 m	09 48 932 3756 015	09 48 932 3757 015
	2.0 m	09 48 932 3756 020	09 48 932 3757 020
	2.5 m	09 48 932 3756 025	09 48 932 3757 025
	5.0 m	09 48 932 3756 050	09 48 932 3757 050
	7.5 m	09 48 932 3756 075	09 48 932 3757 075
	10.0 m	09 48 932 3756 100	09 48 932 3757 100

Other cable lengths on request

Number of contacts

8

4x 2x AWG 24/7
shielding

Technical characteristics

Number of contacts	8
Core structure	4x 2x AWG 24/7, 4x 2x AWG 26/7
Rated current	0.5 A
Rated voltage	50 V
Rated impulse voltage	1.5 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Mating cycles	≥ 100
Locking type	Screw locking, PushPull
Degree of protection acc. to IEC 60529	IP65 / IP67, when mated
Transmission characteristics	Cat. 6A, Class E _A up to 500 MHz

Technical characteristics

Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Tightening torque	2 Nm Lock nut
Material (insert)	Liquid crystal polymer (LCP)
Material (hood/housing)	Zinc die-cast
Material (contacts)	Brass
Surface (contacts)	Gold plated
RoHS	compliant with exemption

Specifications and approvals

IEC 61076-2-109

Details

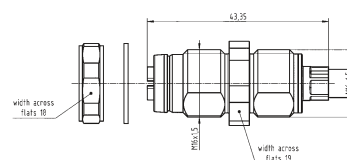
Other cable lengths on request!

Bezeichnung

Artikelnummer

Maßzeichnung

Maße in mm

Circular connectors M12,
Panel feed through,Pre-assembled on one side,
Industrial Ethernet cable
(4x 2x AWG 26/7),
for rear mounting,
Shielded0.3 m
0.5 m
1 m
1.5 m21 33 080 0850 003
21 33 080 0850 005
21 33 080 0850 010
21 33 080 0850 015



RJ45 cords

Directory Chapter 02

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Cables
4-wire

All relevant copper cables that, in conjunction with HARTING's connectors (refer to chapter 03), support Fast Ethernet, Gigabit Ethernet and 2.5 / 5 or 10 Gigabit Ethernet are listed in the HARTING data cables chapter.

Specifically, these are:

- Four-wire data cables for Fast Ethernet (Category 5 for 10 Mbit/s, 100 Mbit/s) in accordance with PROFINET specification to IEC 61784-5-3 and IEC 61918

PROFINET hybrid cables are assigned to the hybrid connectors in chapter 03

- Eight-wire data cables for Gigabit Ethernet (Category 5e or 6 for 1 Gbit/s and Category 6_A or 7 for 2.5 / 5 or 10 Gbit/s) according to ISO/IEC 11801 and EN 50173

Hybrid cables are assigned to the hybrid connectors in chapter 03

HARTING data cables are specially designed to meet the requirements of industrial environments and work optimally when assembled together with HARTING connectors.

This combination ensures easy, quick and safe on-site installations.

All HARTING data cables are excellent for providing reliable Ethernet transmissions in extreme environmental conditions.

They are fully shielded and designed to transmit data in compliance with Category 5/5e (up to 100 MHz), or up to Category 7_A (up to 1000 MHz).

The HARTING data cables are labelled with HARTING specific printing that includes the existing file listings (special testing proofs) and the HARTING raw cable number.

The HARTING raw cable number is always the same for one cable type, even when the cable is sold in different packaging (lengths) or pre-assembled.

Thus, there is always a difference between the printed raw cable number and the HARTING article number on the label!

In any cabling facility, the cables play a crucial role. For the industrial or semi-industrial Ethernet-based applications considered in this catalogue, it is primarily symmetrical copper data lines (twisted pair and quads), hybrid cables (combined data and power supply lines up to 48 V) and fibre optic cables (fibre optic and POF) which are used.

Additional construction types (e.g. USB for service interfaces or MVB/WTB bus cables) are listed to complete the Ethernet cabling portfolios.

The customer's decision on which cables to use is based on the particular application (what is being transferred), the installation environment (where the cabling is being installed), the available connector systems (what terminating technology or connectors are being used with the cable) and any additional properties and tests required (long-term stability, fire testing, etc.).

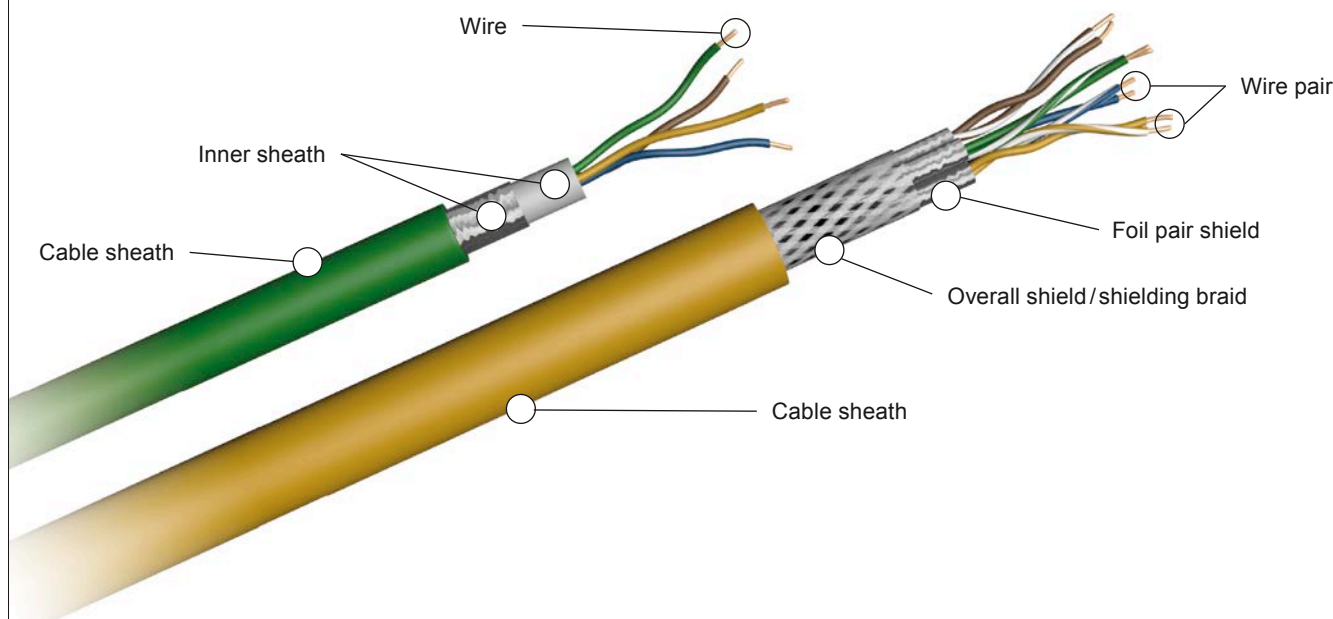
These requirements result in the specifications for the cable, which must always correlate with the cable's termination technique (IDC, preLink®, crimp, piercing or terminal for copper) and its connector (SC, LC, etc. for fibre optic; M12, RJ45 or Han® for copper). The specification for the data cable, created in this way, then determines which cable should be used. Each customer can create this cable specification by answering the following questions related to the customer's own application:

1. Will you be using copper, hybrid or fibre optic cables?

- The range of copper data and hybrid cables is generally limited to 100 metres. When using smaller wire cross-sections (e.g. AWG 26), the length decreases to approximately 40 metres. These cables are shielded to ensure operational safety and compatibility with EMC requirements.
- Fibre optic cables are always used when longer distances have to be bridged or when it would be very difficult to implement the proper shield and ground. Multi-mode cables are designed for distances up to 2 km. Single-mode cables offer a wider range and greater transmission capacity (also refer to bandwidth-length product). POF cables are very easy to assemble on site. Their range is limited, depending on their type, to 50 to 60 metres.

2. What will be transmitted?

- When transmitting Ethernet-based services or protocols with copper lines, you must select the proper category (this of course also applies to the connector being used):
- If fibre optic cables are being used for transmitting Ethernet-based services, then the specifications can be made according to the "Excerpt from ISO/IEC 11 801" table on the next page.
- When using POF, the transmitted automation profile is in accordance with IEC 61784-5 (CP or CPF = Communication Profile or Communication Profile Family). For PROFINET in accordance with IEC 61 784-5-3, 1 mm polymer optical fibre is used.



Design of PROFINET star quad (green) and TP cable 4-wire S/FTP -PiMF (yellow)

Category	Bandwidth	Ethernet	Transmission speed	Required number of wires	Transmission class
5	100 MHz	Fast Ethernet	100 Mbit/s	4	D
5/5e	100 MHz	Gigabit Ethernet	1 and 2.5 Gbit/s	8	D
6	250 MHz	Gigabit Ethernet	1 / 2.5 and 5 Gbit/s	8	E
6A	500 MHz	10 Gigabit Ethernet	10.000 Mbit/s	8	E _A
7	600 MHz	10 Gigabit Ethernet	10 Gbit/s	8	F
7A	1.000 MHz	(10 Gigabit Ethernet)	10.000 Mbit/s	8	F _A

3. Where will the cables be installed?

Our users know their installation environment best. The proper cable is specified (in regards to wire/cable construction and sheath material) by properly selecting the requirements for the application and place of use. These specifications are cost-critical factors for ensuring the cable's proper operation and service life.

- Automation environment → Cable specification according to IEC 61 784-5 or **HARTING PROFINET cables** according to type A (fixed stationary installation), type B (non-stationary installation), type C (special constructions such as drag chain or torsion cable)

Network application	Max. channel attenuation (dB)		
	Multimode 850 nm	Multimode 1300 nm	Singlemode 1310 nm
ISO/IEC/IEEE 8802-3:2017, Clause 9: FOIRL	6.80	-	-
ISO/IEC/IEEE 8802-3:2017, Clauses 15-18: 10BASE-FLand FB	6.80	-	-
ISO/IEC/IEEE 8802-3:2017, Clause 38: 1000BASE-SX ^a	3.56	-	-
ISO/IEC/IEEE 8802-3:2017, Clause 38: 1000BASE-LX ^a	-	2.35	4.56
ISO/IEC/IEEE 8802-3:2017, Clause 26: 100BASE-FX	-	6.00	-
ISO/IEC/IEEE 8802-3:2017, Clause 53: 10GBASE-LX4 ^a	-	2.00	6.20
ISO/IEC/IEEE 8802-3:2017, Clause 68: 10GBASE-LRM ^a	-	1.90	-
ISO/IEC/IEEE 8802-3:2017, Clause 52: 10GBASE-ER	-	-	10.90
ISO/IEC/IEEE 8802-3:2017, Clause 52: 10GBASE-SR ^a	2.60 (OM3) 2.90 (OM4)	-	-
ISO/IEC/IEEE 8802-3:2017, Clause 52: 10GBASE-LR	-	-	6.20
ISO/IEC/IEEE 8802-3:2017, Clause 86: 40GBASE-SR4 ^{a, b}	1.90 (OM3) 1.50 (OM4)	-	-
ISO/IEC/IEEE 8802-3:2017, Clause 87: 40GBASE-LR4	-	-	6.70
ISO/IEC/IEEE 8802-3:2017, Clause 89: 40GBASE-FR	-	-	4.00
ISO/IEC/IEEE 8802-3:2017, Clause 95: 100GBASE-SR4 ^{a, b}	1.80 (OM3) 1.90 (OM4)	-	-
ISO/IEC/IEEE 8802-3:2017, Clause 86: 100GBASE-SR10 ^{a, b}	1.90 (OM3) 1.50 (OM4)	-	-
ISO/IEC/IEEE 8802-3:2017, Clause 88: 100GBASE-LR4	-	-	6.30
ISO/IEC/IEEE 8802-3:2017, Clause 88: 100GBASE-ER4	-	-	18.00
1 Gbit/s FC (1.0625 GBd) ^a	2.62 (OM3)	-	7.80
2 Gbit/s FC (2.125 GBd) ^a	3.31 (OM3)	-	7.80
4 Gbit/s FC (4.25 GBd) ^a	2.88 (OM3) 2.95 (OM4)	-	4.80
8 Gbit/s FC (8.5 GBd) ^a	2.04 (OM3) 2.19 (OM4)	-	6.40
16 Gbit/s FC (14.025 GBd) ^a	1.86 (OM3) 1.95 (OM4)	-	6.40
32 Gbit/s FC ^a	1.75 (OM3) 1.86 (OM4)	-	6.40

^a A bandwidth-limited application at the channel lengths shown. The use of lower attenuation components to produce channels exceeding the values shown cannot be recommended.

^b These are multi-fibre applications and are subject to a delay skew requirement which is met by design if all the optical fibres providing a channel transverse the same cable and cord from end-to-end.

Excerpt from ISO/IEC 11 801

- Connection from a facility/automation island to IT → use **installation cable**
- Outdoor installations → use **HARTING outdoor cable**
- Installation in/on train → use **HARTING EtherRAIL® cable**
- Installation in bus or tram → use **HARTING cable in accordance with ISO 6722:2006** (UN ECE-R 118 Rev.1 + Amdm.1:2013-11)

4. Which connectors or terminating technique will you be using?

The use of certain connector types, if not already specified, is mainly determined by the application. HARTING offers all of the necessary connector types; they are listed in this catalogue according to their applications.

5. What additional requirements must the cabling meet?

If there are additional specific requirements, these need to be checked with the specifications for the cable being used. All of the primary requirements for data cables for special applications are already covered by HARTING's Ethernet cable product portfolio. HARTING's portfolio naturally meets requirements for oil resistance, crush resistance and a wide temperature range for industrial-grade cables. But there may be other crucial requirements which are not covered by our standard designs and must be requested separately, such as resistance to welding beads, special hybrid constructions, etc.

Cable materials

Copper data cables consist of the core material (copper wires or strands, tinned or non-tinned), the core insulation (foamed or non-foamed plastics such as PVC or PE) foils and copper braids for shielding, possibly liners or inner shells (for PROFINET cable), fillers or tension elements, additional foils or layers, and the outer sheath.

All of these cable materials determine the electrical parameters (such as the category), as well as the mechanical, chemical and EMC characteristics.

Unlike connectors, cable may introduce a significant amount of material into a facility or cabling installation. This affects the flammability characteristics and fire loads.

Thus, the materials chosen for the core insulation and the sheath are very important.

The key characteristics of the cable sheath and its material are:

- PVC (polyvinyl chloride): lightweight, highly flexible (soft) material that can be processed well. Very resistant to oils and fats; prevalent in the industrial environment. PVC has a very high flame resistance. If a PVC soot material is added, this makes an excellent sheathing material for outer cable. The addition of soot inevitably leads to black colour and provides the necessary UV resistance for the cable.

PVC is not halogen-free. The disadvantage is that it releases toxic gases during a fire and forms hydrochloric acid when combined with (extinguishing) water which can cause further damage.

- PUR (polyurethane): is a very robust material with excellent characteristics for industrial and industry-related applications. It is halogen-free and has outstanding oil resistance, chemical resistance and abrasion resistance. It also has good flame resistance and is suitable for non-stationary applications.
- PE (polyethylene): has many characteristics similar to PUR, but worse oil resistance and chemical resistance. It is extremely anti-hygroscopic (limited absorption with surrounding water) and safe for use in food processing applications, so it is well suited for HARTING's F+B portfolio.

Elastomer materials (which are similar to PE) have been developed for use in HARTING EtherRail® cables. The elastomer is irradiated, which provides the cable with its excellent temperature and fire characteristics.

- FRNC (Flame Retardant Non-Corrosive) thermoplastic polyolefine: a halogen-free material with excellent flame resistance. FRNC cables can be readily processed and are widely used in structured building cabling (fixed routing, installation cables). For industrial applications, however, FRNC cables are rarely used because of their insufficient resistance to oil and chemicals.

The general term LSZH (Low Smoke Zero Halogen) is often used to describe cables for building installation and structured cabling. LSZH actually describes the properties of the cable sheath and not the real material composition.

Copper wires in data cables

The size, cross section and construction of the copper wire in data cables determine the electrical and hence also the transmission characteristics.

A distinction is made between hard core and stranded wires. Hard core wires are normally used

for stationary installations where the cables hardly move. Stranded wires consist of several individual strands. This is used for making flexible and highly flexible cables; it is well suited for use in non-stationary applications.

The size of the copper wires is indicated in AWG (American Wire Gauge). An overview of the sizes is provided below.

As the wire cross section increases (smaller AWG numbers), the signal attenuation in the cable (IL = Insertion Loss) lowers and the range of the data cable lengthens. This is why PROFINET cables (e.g. type A with four AWG22/1 wires) operate with a 100 metre range and why patch/connecting cables (with only AWG26/7 wire strands) are intended for 20 to 40 metre ranges.

Type 1
(massive copper wire, excerpt from ASTM B286)

AWG					Maximum DC resistance of 20 °C			
AWG specification	Cross-sectional area		Nominal diameter		Tinned surfaces		Bare copper wires or silver-plated surfaces	
	cmils	mm ²	in.	mm	Ω/1000 ft	Ω/km	Ω/1000 ft	Ω/km
22	640	0.324	0.0253	0.643	17.2	56.430	16.5	54.133
24	404	0.205	0.0201	0.511	27.2	89.238	26.2	85.958
26	253	0.128	0.0159	0.404	44.5	145.997	41.9	137.467
28	159	0.081	0.0126	0.320	70.8	232.283	66.8	219.160

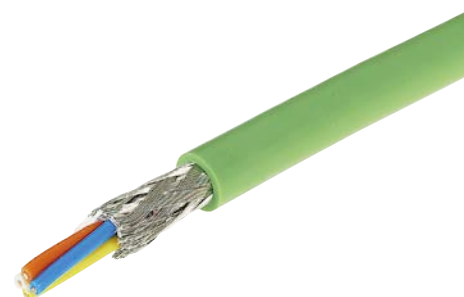
Type 2
(stranded copper wire, excerpt from ASTM B286)

Wire construction								Max. DC resistance of 20 °C			
AWG specification	Number of wire cores	Diameter of the individual wires		Calculated cross-sectional area		Maximum permitted diameter		Tinned surfaces		Bare copper wires or silver-plated	
		in.	mm	cmils	mm ²	in.	mm	Ω/1000 ft	Ω/km	Ω/1000 ft	Ω/km
22-19	19	0.0063	0.160	754	0.382	0.033	0.84	15.9	52.165	14.8	48.556
22- 7	7	0.0100	0.254	700	0.355	0.031	0.79	16.7	54.790	15.6	51.181
24-19	19	0.0050	0.127	475	0.241	0.027	0.69	25.4	83.333	23.6	77.428
24- 7	7	0.0080	0.203	448	0.227	0.025	0.64	26.2	85.958	24.5	80.381
26-19	19	0.0040	0.102	304	0.154	0.022	0.56	40.1	131.56	37.3	122.37
26- 7	7	0.0063	0.160	278	0.141	0.020	0.51	42.6	139.76	39.7	130.24
28-19	19	0.0031	0.079	183	0.093	0.017	0.43	67.7	222.11	63.1	207.02
28- 7	7	0.0050	0.127	175	0.089	0.016	0.40	68.2	223.75	63.6	208.66

Cross sections of copper wires



Industrial Cat. 5 standard cable, 4-wire
Type A



Features

- Sheath material PVC
- Category Cat. 5
- Number of wires 4
- Wire design AWG 22/1
- Wire diameter 6.5 mm

Application

- For permanent installation or to build-up PROFINET system cable

Benefits

- Robust design suitable for industry
- PROFINET compliant
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

Technical characteristics

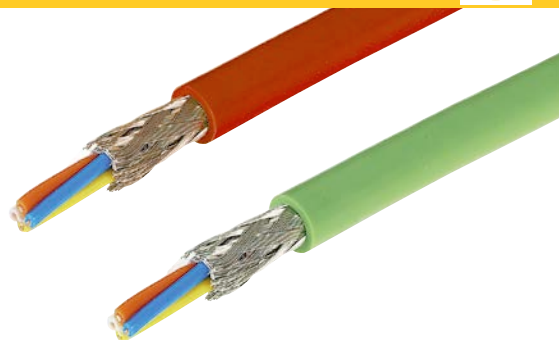
Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/1, solid
Wire insulation	PE, Ø 1.5 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm
Transmission performance	Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
Data rate	10 Mbit/s, 100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C ... +75 °C
Colour	Green
Printing	HARTING specific printing

Identification	Part number PVC	Drawing	Dimensions in mm
Industrial Cat. 5 standard cable Type A, 4-wire	Green		
20 m ring 50 m ring 100 m ring 500 m drum	09 45 600 0130 09 45 600 0140 09 45 600 0100 09 45 600 0110		

Other cable lengths on request



Industrial Cat. 5 stranded cable, 4-wire
Type B



Features

- Sheath material PVC
- Category Cat. 5
- Number of wires 4
- Wire design AWG 22/7
- Wire diameter 6.5 mm

Application

- To build-up PROFINET/SERCOS III system cable

Benefits

- Robust design suitable for industry
- PROFINET compliant (Green)
- SERCOS III compliant (Red)
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

Technical characteristics

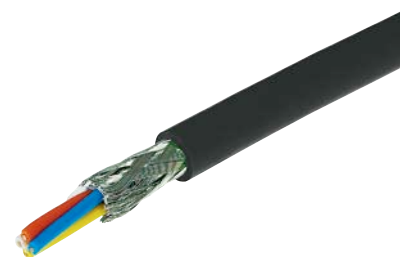
- Cable structure Star quad, double shielding
- Core structure 4 x AWG 22/7, tinned copper wire, stranded
- Wire insulation PE, Ø 1.56 mm
- Sheath material PVC
- Cable sheath diameter 6.5 mm
- Transmission performance Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Shielding foil and shielding braid
- Operating temperature range -40 °C ... +70 °C
- Colour Green (PROFINET)
Red (SERCOS III)
- Printing HARTING specific printing

Identification	Part number		Drawing	Dimensions in mm
	PVC	SERCOS III PVC		
Industrial Cat. 5 stranded cable Type B, 4-wire	Green	Red		
20 m ring	09 45 600 0132	09 45 600 0134		
50 m ring	09 45 600 0142	09 45 600 0144		
100 m ring	09 45 600 0102	09 45 600 0104		
500 m drum	09 45 600 0112	09 45 600 0114		

Other cable lengths on request



Industrial Cat. 5 stranded cable, 4-wire,
Type B, outdoor



Features

- Sheath material PVC
- Category Cat. 5
- Number of wires 4
- Wire design AWG 22/7
- Wire diameter 6.5 mm

Application

- To build-up PROFINET system cable

Benefits

- Robust design suitable for industry
- PROFINET compliant
- UV protected
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

Technical characteristics

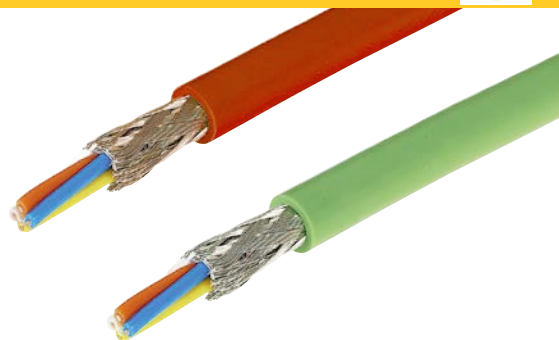
- Cable structure Star quad, double shielding
- Core structure 4 x AWG 22/7, stranded
- Wire insulation PE, Ø 1.56 mm
- Sheath material PVC
- Cable sheath diameter 6.5 mm
- Transmission performance Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Shielding foil and shielding braid
- Operating temperature range -45 °C ... +60 °C
- Colour Black
- Printing HARTING specific printing

Identification	Part number PVC	Drawing	Dimensions in mm
Industrial Cat. 5 stranded cable, 4-wire, Type B, outdoor	Black		
20 m ring 50 m ring 100 m ring 500 m drum	09 45 600 0135 09 45 600 0145 09 45 600 0105 09 45 600 0115		

Other cable lengths on request



Industrial Cat. 5 stranded cable, 4-wire,
useable as trailing cables,
Type C



Features

- Sheath material PUR
- Category Cat. 5
- Number of wires 4
- Wire design AWG 22/7
- Wire diameter 6.5 mm

Application

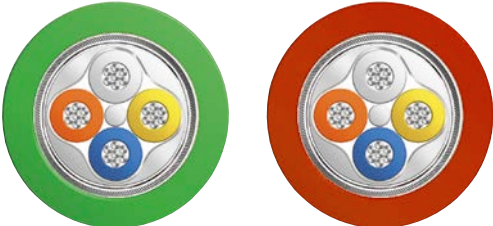
- To connect to mobile equipment
to build-up PROFINET/SERCOS III system cable

Benefits

- Robust design suitable for industry
- PROFINET compliant (Green)
- SERCOS III compliant (Red)
- Useable as trailing cables
- Easy stripping of cable sheath and screening braid
with stripping tool 09 45 800 0000
- RoHS compliant

Technical characteristics

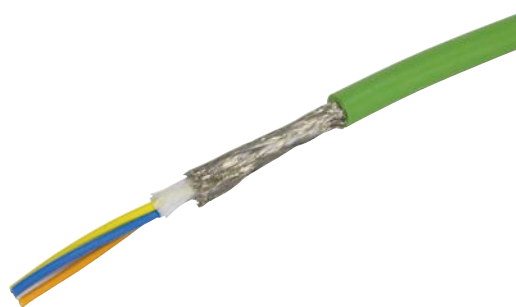
- Cable structure Star quad, double shielding
- Core structure 4 x AWG 22/7, stranded
- Wire insulation PE, Ø 1.5 mm
- Sheath material PUR
- Cable sheath diameter 6.5 mm
- Transmission performance Category 5,
Class D up to 100 MHz
acc. to ISO/IEC 11801,
EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Shielding foil and shielding braid
- Operating temperature range -40 °C ... +70 °C
- Colour Green (PROFINET)
Red (SERCOS III)
- Printing HARTING specific printing

Identification	Part number		Drawing	Dimensions in mm
	PUR	SERCOS III PUR		
Industrial Cat. 5 stranded cable, 4-wire, useable as trailing cables, Type C	Green	Red		
20 m ring	09 45 600 0131	09 45 600 0137		
50 m ring	09 45 600 0141	09 45 600 0147		
100 m ring	09 45 600 0101	09 45 600 0107		
500 m drum	09 45 600 0111	09 45 600 0117		

Other cable lengths on request



Industrial Cat. 5 stranded cable, 4-wire,
useable as torsion cables,
Type C



Features

- Sheath material PUR
- Category Cat. 5
- Number of wires 4
- Wire design AWG 22/19
- Wire diameter 6.5 mm

Application

- To connect to mobile equipment to build-up PROFINET system cable

Benefits

- Robust design suitable for industry
- PROFINET compliant (Green)
- Useable as torsion cables
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

Technical characteristics

- Cable structure Star quad, double shielding
- Core structure 4 x AWG 22/19, stranded
- Wire insulation PE, Ø 1.52 mm
- Sheath material PUR
- Cable sheath diameter 6.5 mm
- Transmission performance Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Shielding foil and shielding braid
- Operating temperature range -40 °C ... +80 °C
- Colour Green (PROFINET)
- Printing HARTING specific printing

Identification

Part number

Drawing

Dimensions in mm

Industrial Cat. 5
stranded cable, 4-wire,
useable as torsion cables,
Type C

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 1110
09 45 600 1120
09 45 600 1130
09 45 600 1140





PROFINET 4 TP type A cable, 8-wire, PVC

Features

- Sheath material PVC
- Category Cat. 6_A
- Number of wires 8
- Wire design AWG 23/1
- Wire diameter 7.9 mm

Application

This data cable can be used for the cabling acc. to type A of the PROFINET cabling standard. The four pair TP construction allows the transmission of IT data and analog signals such as 10 Mbit/s, 100 Mbit/s, 10 Gbit/s, video and audio as well as IP data services.

Benefits

- PROFINET compliant (green)
- For fixed installation
- Flame retardant
- RoHS compliant
- Usable for the Fast Ethernet and Gigabit Ethernet data cabling in industrial applications

Technical characteristics

- Cable structure 4 x 2, Twisted Pair, shielded
- Core structure 4 pairs AWG 23/1
- Wire insulation PE, Ø 1.4 mm
- Sheath material PVC
- Cable sheath diameter 7.9 mm
- Transmission performance Category 6_A, Class E_A up to 500 MHz acc. to EN 50288, IEC 61156
- Data rate 110 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Foil and tinned copper braid
- Operating temperature range
 - fix operation -20 °C ... +60 °C
 - flexible operation 0 °C ... +50 °C
- Colour Green

Identification

PROFINET 4 TP type A cable,
8-wire, Cat. 6_A, PVC

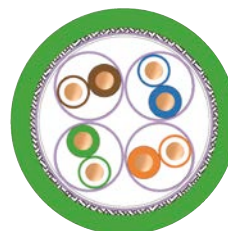
20 m ring
50 m ring
100 m ring
500 m drum

Part number

09 45 600 1200
09 45 600 1210
09 45 600 1220
09 45 600 1230

Drawing

Dimensions in mm



Other cable lengths on request



PROFINET 4 TP type B cable, 8-wire, PVC

Features

- Sheath material PVC
- Category Cat. 6_A
- Number of wires 8
- Wire design AWG 23/7
- Wire diameter 8.7 mm

Application

This data cable can be used for the cabling acc. to type B of the PROFINET cabling standard. The four pair TP construction allows the transmission of IT data and analog signals such as 10 Mbit/s, 100 Mbit/s, 10 Gbit/s, video and audio as well as IP data services.

Benefits

- PROFINET compliant (green)
- Suitable for flexible system cables
- Flame retardant
- RoHS compliant
- Usable for the Fast Ethernet and Gigabit Ethernet data cabling in industrial applications
- UL certified
- UV proof

Technical characteristics

- Cable structure 4 x 2, Twisted Pair, shielded
- Core structure 4 pairs AWG 23/7
- Wire insulation PE, Ø 1.59 mm
- Sheath material PVC
- Cable sheath diameter 8.7 mm
- Transmission performance Category 6_A, Class E_A up to 500 MHz acc. to EN 50288, IEC 61156
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Tinned copper braid
- Operating temperature range –40 °C ... +80 °C
- Colour Green

Identification

Part number

Drawing

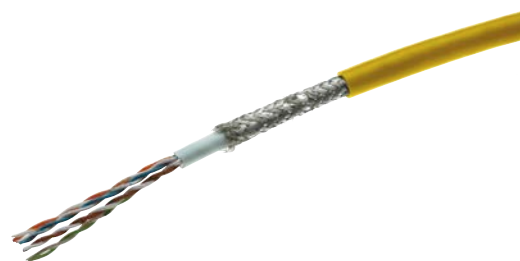
Dimensions in mm

PROFINET 4 TP type B cable,
8-wire, Cat. 6_A, PVC

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 1211
09 45 600 1221
09 45 600 1231
09 45 600 1241





Industrial Cat. 5/Cat. 5e high flexible cable, 8-wire, PUR

Features

- Sheath material PUR
- Category Cat. 5/Cat. 5e
- Number of wires 8
- Wire design AWG 26/19
- Wire diameter 6.8 mm

Application

- Trailing
- Fit for torsion strength

Benefits

- Robust design suitable for industry
- Usable as trailing cables in drag chains and fit for torsion strength
- Usable for transfer rate up to 1 Gigabit Ethernet
- Halogen free
- Flame retardant
- Free silicone oil
- RoHS compliant
- UL certified

Technical characteristics

- Cable structure 4 x 2, Twisted Pair, shielded
- Core structure 4 x 2 x AWG 26/19
- Wire insulation PE, Ø 1.0 mm
- Sheath material PUR
- Cable sheath diameter 6.6 mm
- Transmission performance Category 5/Category 5e, Class D up to 100 MHz acc. to EN 50288-2-2:2004, IEC 61156-6:2002
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s
- Shielding Overall screen of tinned copper braid
- Operating temperature range
 - fix operation -40 °C ... +80 °C
 - flexible operation -30 °C ... +70 °C
 - flexible operation with forced Guidance -20 °C ... +60 °C
- Bending cycles 5 million
- Colour Yellow
- Fit for torsion strength 1 Mio. Zyklen

Cables
8-wire

Identification

Part number

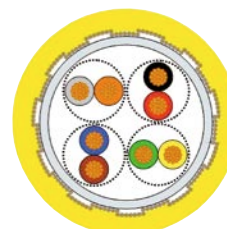
Drawing

Dimensions in mm

Industrial Cat. 5/Cat. 5e
installation cable, 8-wire
PUR

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0236
09 45 600 0246
09 45 600 0206
09 45 600 0256



Other cable lengths on request



Industrial Cat. 5/Cat. 5e stranded cable, 8-wire, PVC, Outdoor

Features

- Sheath material PVC
- Category Cat. 5/Cat. 5e
- Number of wires 8
- Wire design AWG 26/7
- Wire diameter (6.5 ... 6.9) mm

Technical characteristics

- Cable structure 4 x 2, Twisted Pair, shielded
- Core structure 4 x 2 x AWG 26/7
- Wire insulation PE, Ø 1.0 mm
- Sheath material PVC
- Cable sheath diameter 6.5 mm ... 6.9 mm
- Transmission performance Category 5/Category 5e, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s
- Shielding Foil screen and additional plaited cable
- Operating temperature range
fix operation -40 °C ... +80 °C
flexible operation -10 °C ... +60 °C
- Colour Black

Application

- To build-up flexible connections (one- or two-sided assembled system cable)

Benefits

- Robust design suitable for industry
- Applicable also for outside applications
- UL, AWM style 2969
- Flame retardant
- Weather proof
- UV resistant
- RoHS compliant
- With Fast Connect inside shealth

Identification Part number Drawing Dimensions in mm

Industrial Cat. 5/Cat. 5e
stranded cable,
8-wire, outdoor
PVC

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0230
09 45 600 0240
09 45 600 0200
09 45 600 0220



Industrial Cat. 6_A cable, stranded, 8-wire, PVC

Features

- Sheath material PVC
- Category Cat. 6_A
- Number of wires 8
- Wire design AWG 26/7
- Wire diameter (6.3 ... 6.9) mm

Application

- To build-up flexible connections (one- or two-sided assembled system cable)

Benefits

- Robust design suitable for industry
- Optimal performance reserves
-  UL, AWM style 20 276
- Flame retardant
- RoHS compliant
- Best useable for all 8-wire HARTING RJ45 connectors

Technical characteristics

- | | |
|--------------------------------|--|
| Cable structure | 4 x 2, Twisted Pair, shielded, PIMF |
| Core structure | 4 x 2 x AWG 26/7 |
| Wire insulation | PE, Ø 1.05 mm |
| Sheath material | PVC |
| Cable sheath diameter | 6.3 mm ... 6.9 mm |
| Transmission performance | Category 6 _A ,
Class E _A up to 500 MHz
acc. to ISO/IEC 11801,
EN 50 173-1 |
| Data rate | 10 Mbit/s, 100 Mbit/s, 1 Gbit/s,
2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s |
| Shielding | Paired shielded with additional
cable shield |
| Operating
temperature range | -20 °C ... +80 °C |
| Colour | Yellow |

Identification

Part number

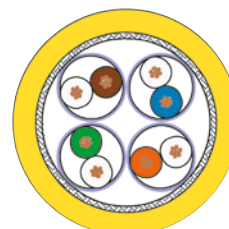
Drawing

Dimensions in mm

Industrial Cat. 6_A cable, stranded,
8-wire
PVC

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0532
09 45 600 0542
09 45 600 0502
09 45 600 0522

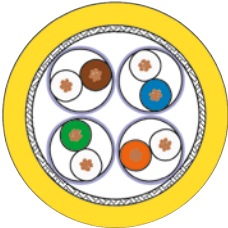


Other cable lengths on request



Industrial Cat. 6_A cable, stranded, 8-wire, PUR

Features		Technical characteristics	
• Sheath material	PUR	Cable structure	4 x 2, Twisted Pair, shielded, PIMF
• Category	Cat. 6 _A	Core structure	4 x 2 x AWG 26/7
• Number of wires	8	Wire insulation	PE, Ø 1.05 mm
• Wire design	AWG 26/7	Sheath material	PUR
• Wire diameter	(6.3 ... 6.9) mm	Cable sheath diameter	6.3 mm ... 6.9 mm
Application		Transmission performance	Category 6 _A , Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50 173-1
• To build-up flexible connections (one- or two-sided assembled system cable)		Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Benefits		Shielding	Paired shielded with additional cable shield
• Robust design suitable for industry		Operating temperature range	-40 °C ... +80 °C
• Optimal performance reserves		Colour	Yellow
• Halogen free			
• RoHS compliant			
• Flame retardant			

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 6 _A cable, stranded, 8-wire PUR 20 m ring 50 m ring 100 m ring 500 m drum	09 45 600 0630 09 45 600 0640 09 45 600 0600 09 45 600 0620		

Other cable lengths on request



Industrial Cat. 6_A cable, stranded, 8-wire, PVC, Outdoor

Features

- Sheath material PVC
- Category Cat. 6_A
- Number of wires 8
- Wire design AWG 26/7
- Wire diameter (6.3 ... 6.9) mm

Application

- To build-up flexible connections (one- or two-sided assembled system cable)

Benefits

- Robust design suitable for industry
- Optimal performance reserves
- Usable for outdoor applications
- UV proof
- RoHS compliant
- UL, AWM style 20 276
- Flame retardant

Technical characteristics

- Cable structure 4 x 2, Twisted Pair, shielded, PIMF
- Core structure 4 x 2 x AWG 26/7
- Wire insulation PE, Ø 1.05 mm
- Sheath material PVC
- Cable sheath diameter 6.3 mm ... 6.9 mm
- Transmission performance Category 6_A, Class E_A up to 500 MHz acc. to ISO/IEC 11 801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Paired shielded with additional cable shield
- Operating temperature range -20 °C ... +80 °C
- Colour Black

Identification

Part number

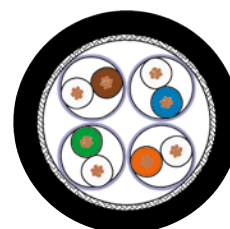
Drawing

Dimensions in mm

Industrial Cat. 6_A stranded cable,
8-wire, Outdoor
PVC

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0531
09 45 600 0541
09 45 600 0501
09 45 600 0521



Other cable lengths on request



Industrial Cat. 7 sea cable, 8-wire, FRNC

Features

- Sheath material FRNC
- Category Cat. 7
- Number of wires 8
- Wire design AWG 26/7
- Wire diameter 7.1 mm

Application

- Especially suitable for data cabling on and below deck of civil ships as well as other offshore applications

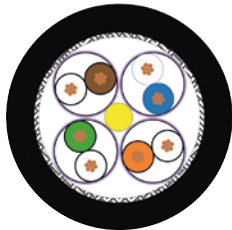
Benefits

- Flame retardant, halogen free and RoHS compliant
- Oil and UV resistant
- Suitable for structured cabling acc. to Cat. 7, class F (ISO/IEC 11801 resp. EN 50173)
- Qualified for the transmission of Gigabit- and 10 Gigabit-Ethernet acc. to IEEE 802.3

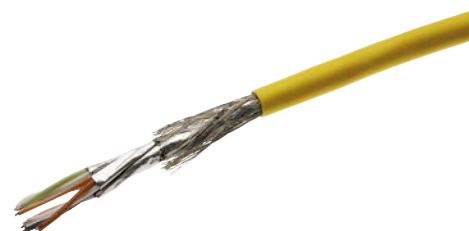
Technical characteristics

- Core structure 4 x 2 x AWG 26/7
- Sheath material FRNC
- Cable sheath diameter 7.1 mm
- Transmission performance Cat. 7, Class F up to 600 MHz
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Operating temperature range -40 ... +80 °C
- Colour Black

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 7 sea cable, 8-wire FRNC			
100 m ring	09 45 600 0525		
500 m reel	09 45 600 0523		
1000 m reel	09 45 600 0524		



Other cable lengths on request



Industrial Cat. 7 cable, 8-wire, PUR

Features

- Sheath material PUR
- Category Cat. 7
- Number of wires 8
- Wire design AWG 23/1
- Wire diameter 8.3 mm

Application

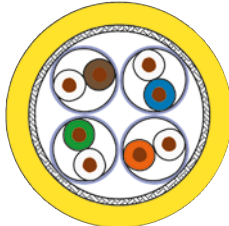
- To realize fixed connections, e.g. between control cabinet and industrial outlet (on-site installation of cabling for production halls, equipment or automation applications)

Benefits

- Robust design suitable for industry
- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- Flame retardant
- Oil retardant
- RoHS conform
- Halogen free

Technical characteristics

- Cable structure 4 x 2, Twisted Pair, shielded, PIMF
- Core structure 4 x 2 x AWG 23/1, solid copper wire
- Wire insulation PE, Ø 1.4 mm
- Sheath material PUR
- Cable sheath diameter 8.3 mm
- Transmission performance Category 7, Class F up to 600 MHz
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Paired shielded with additional cable shield
- Operating temperature range
fix operation -40 °C ... +70 °C
flexible operation -10 °C ... +50 °C
- Colour Yellow

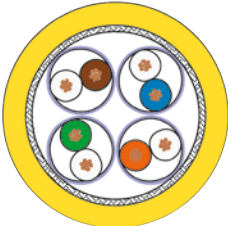
Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 7 installation cable, 8-wire PUR			
100 m ring	09 45 600 0651		
500 m reel	09 45 600 0650		
1000 m reel	09 45 600 0660		

Other cable lengths on request



Industrial data cable, 8-wire, Cat. 7_A, PUR

Features		Technical characteristics	
• Sheath material	PUR	Cable structure	4 x 2, Twisted Pair, shielded, PIMF
• Category	Cat. 7 _A	Core structure	4 x 2 x AWG 26/7
• Number of wires	8	Wire insulation	PE, Ø 1.05 mm
• Wire design	AWG 26/7	Sheath material	PUR
• Wire diameter	(6.3 ... 6.9) mm	Cable sheath diameter	6.3 mm ... 6.9 mm
Application		Transmission performance	Category 7 _A , Class F _A up to 1200 MHz acc. to ISO/IEC 11801, EN 50 173-1
• To build-up flexible connections (one- or two-sided assembled system cable)		Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Benefits		Shielding	Paired shielded with additional cable shield
• Robust design suitable for industry		Operating temperature range	
• Optimal performance reserves		fix operation	–40 °C ... +70 °C
• Flame retardant		flexible operation	–10 °C ... +50 °C
• Halogen free		Colour	Yellow
• RoHS compliant			
• Oil retardant			

Identification	Part number	Drawing	Dimensions in mm
Industrial data cable 8-wire, Cat. 7 _A PUR 100 m ring 500 m reel 1000 m reel	09 45 600 0711 09 45 600 0721 09 45 600 0751		

Other cable lengths on request

Directory Chapter 03

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General information	03.02
M8 connector D-coding	03.06
M12 connector D-coding	03.07
M12 connector X-coding	03.23
RJ45 IP20 connector	03.35
HARTING ix Industrial®	03.59
PushPull RJ45 IP65 / IP67 connector	03.64
Han® 1 A connector	03.88
Han® 3 A RJ45 IP65 / IP67 connector	03.94
Han® 3 A RJ45 Hybrid IP65 / IP67 connector	03.108
Han® 3 A LC duplex Hybrid connector	03.118
Han-Modular® connector	03.119
<i>har</i> -port coupler	03.125

All relevant data connectors that, in conjunction with HARTING's data cables (refer to chapter 02), support Fast Ethernet, Gigabit Ethernet and 10 Gigabit Ethernet are listed in the termination and connection technology chapter.

Housings, junction boxes, 19" rails and DIN rail distribution are also listed along with their complementary connectors.

All HARTING cabling solutions for Ethernet (and the corresponding termination and connection technology), are fully screened so they guarantee reliable data transmissions for all installation locations and under all operating conditions.

The HARTING Ethernet connectivity products come with insulation displacement technology (IDC) as well as with crimp technology; so they can be installed on-site at any time.

The preLink® is a special type of IDC termination technology developed by HARTING which enables you to quickly connect a terminating block in a single operation to all eight cable wires and then attach the desired connector (RJ45 or M12, male or female).

The RJ45 connectors are very important; they are constructed according to IEC 60 603-7-x (where x

indicates the male/female version, so that Category 5 to 100 MHz, shielded → x = 3, Category 6 up to 250 MHz, shielded → x = 5 or Category 6A to 500 MHz, shielded → x = 51).

RJ45 connectors are available in many different variants, especially for IP20 area applications. By adding the corresponding protective housing, the RJ45 connectors can be upgraded for use in IP65 / IP67 environments. These are then:

- RJ45 Han® PushPull (PROFINET interface)
- RJ45 Han® 3 A (a standard in the industry, PROFINET interface)
- RJ45 HARTING PushPull (interface for structured building cabling according to ISO/IEC 11 801), a space-saving variant
- RJ45 hybrid solutions (PROFINET interface)

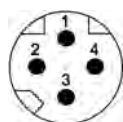
In addition to the RJ45, the M12 mating profile also plays an important role in Ethernet cabling. The M12 D-coded connector has been designed for the transmission of (four wire) Fast Ethernet. The M12 X-coded connector is best suited for transmitting Gigabit or 10 GB (eight wire) Ethernet. M12 connectors with crimp terminations also play a very important role in railway technology. All M12 connectors are IP65 / IP67 compatible.

Specifications

IEC 61076-2-101, IEC 61076-2-109, 

M8-circular connectors

D-coding, mating face acc. to IEC 61076-2-114



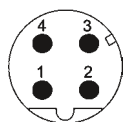
Male, 4-poles



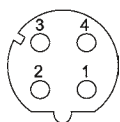
Female, 4-poles

M12-circular connectors

D-coding, mating face acc. to IEC 61076-2-101

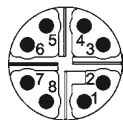


Male, 4-poles

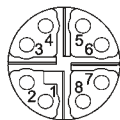


Female, 4-poles

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



Male, 8-poles



Female, 8-poles

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



8 poles pin assignment

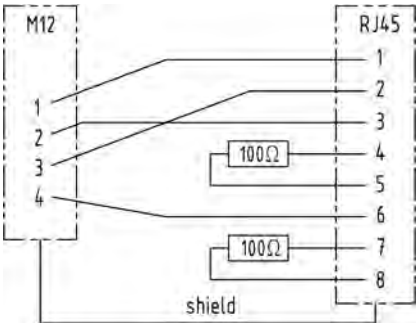
Signals		Pin assignment			Cable		
1/10Gbit	10/100 Mbit	RJ45	M12 D-coded	M12 X-coded	4-wire	568A	568B
BI_DA+	TxData+	1	1	1	yellow	white/green	white/orange
BI_DA-	TxData-	2	3	2	orange	green	orange
BI_DB+	RxData+	3	2	3	white	white/orange	white/green
BI_DC+	-	4	-	8		blue	blue
BI_DC-	-	5	-	7		white/blue	white/blue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

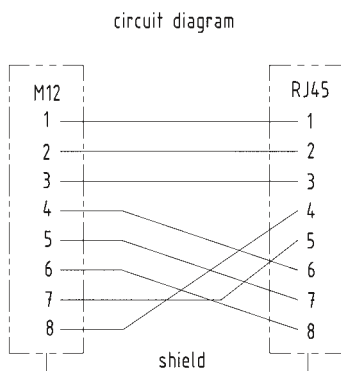
Stromlaufplan
circuit diagram



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

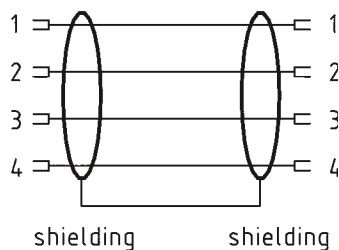


Gender changer

4 poles



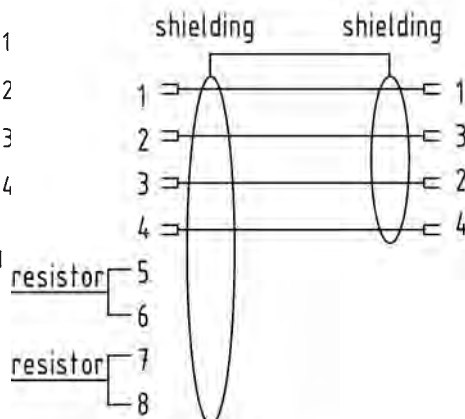
schematic diagram



4 poles / 8 poles



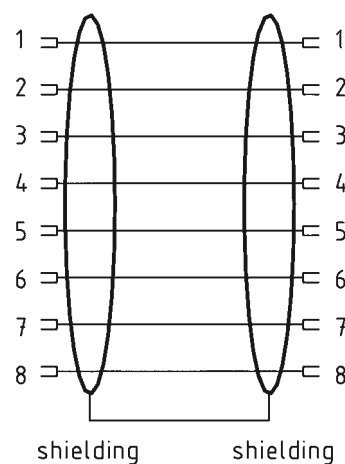
schematic diagram



8 poles



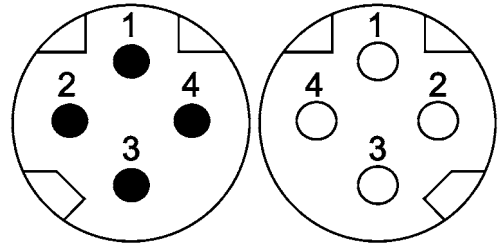
schematic diagram



Number of contacts

4

HARAX® connection technology
Shielded



Technical characteristics

Number of contacts	4
Rated current	4 A
Rated voltage	60 V
Rated impulse voltage	1.5 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Mating cycles	≥ 100
Locking type	Screw locking, PushPull
Degree of protection acc. to IEC 60529	IP65 / IP67, in locked position

Technical characteristics

Cable diameter	6.2 ... 6.8 mm
Transmission characteristics	Cat. 5, Class D up to 100 MHz
Tightening torque	0.4 Nm
Material (insert)	Polyamide (PA)
Material (hood/housing)	Polyamide (PA), Zinc die-cast
Material (contacts)	Copper alloy
Surface (contacts)	Gold plated

Specifications and approvals

IEC 61076-2-114

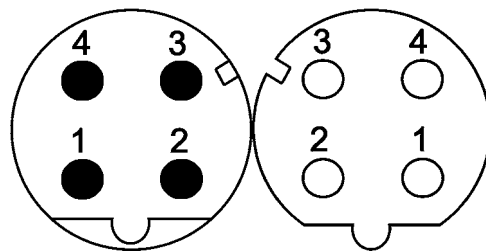
Identification	Part number		Drawing	Dimensions in mm
	Male	Female		
Circular connectors M8, Cable connector, straight, HARAX® connection technology, Shielded, Screw locking	21 02 185 1405	21 02 185 2405		
Circular connectors M8, Cable connector, straight, HARAX® connection technology, Shielded, PushPull locking	21 02 185 1430			



Number of contacts

4

HARAX® connection technology
Shielded



Technical characteristics

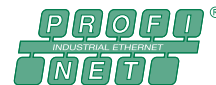
Number of contacts	4
Rated current	4 A
Rated voltage	50 V
Rated impulse voltage	1.5 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Mating cycles	≥ 100
Wire outer diameter	≤ 2 mm
Locking type	Screw locking
Degree of protection acc. to IEC 60529	IP65 / IP67, in when mated position
Conductor cross-section	0.14 ... 0.34 mm ² , 0.34 ... 0.75 mm ²
Conductor cross-section	AWG 26 ... AWG 22, AWG 22 ... AWG 18
Cable diameter	4.5 ... 8.8 mm

Technical characteristics

Transmission characteristics	Cat. 5, Class D up to 100 MHz
Tightening torque	0.6 Nm, 2 Nm Lock nut
Material (insert)	Polyamide (PA)
Material (hood/housing)	Zinc die-cast
Material (contacts)	Brass
Surface (contacts)	Gold plated
RoHS	compliant with exemption

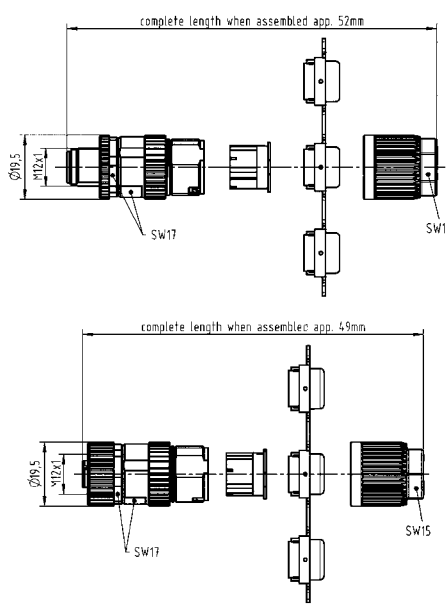
Specifications and approvals

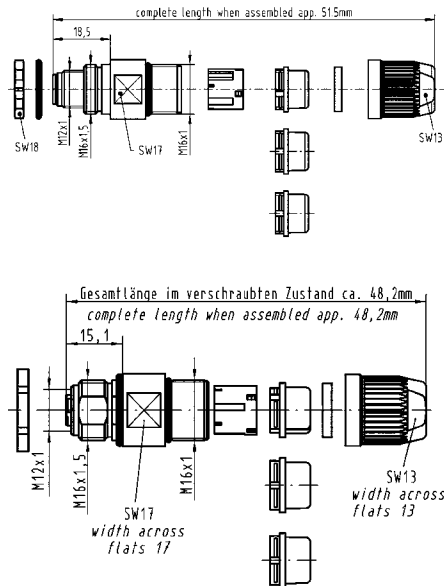
IEC 61076-2-101
UL 1977 ECBT2.E102079
CSA-C22.2 No. 182.3 ECBT8.E102079



Details

Suitable for Fast Ethernet only

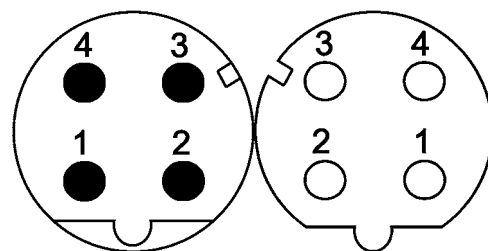
Identification	Conductor cross-section (mm ²)	Path Number		Drawing	Dimensions in mm
		Male	Female		
Circular connectors M12, M12-L, Cable connector, Straight, HARAX® connection technology, Shielded, 	0.14 ... 0.34 0.34 ... 0.75	21 03 281 1405 21 03 282 1405	21 03 281 2405 21 03 282 2405		

Identification	Conductor cross-section (mm²)	Male	Path number	Female	Drawing	Dimensions in mm
Circular connectors M12, M12-L, Cable connector, Panel feed through, for rear mounting, HARAX® connection technology, Shielded 	0.14 ... 0.34	21 03 381 1425		21 03 381 2425	 complete length when assembled app. 515mm Gesamtlänge im verschraubten Zustand ca. 48,2mm complete length when assembled app. 48,2mm width across flats 17 width across flats 13	

Number of contacts

4

HARAX® connection technology
Shielded



Technical characteristics

Number of contacts	4
Rated current	4 A
Rated voltage	50 V
Rated impulse voltage	1.5 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Mating cycles	≥ 500
Wire outer diameter	≤ 2 mm
Locking type	Schraubverriegelung
Degree of protection acc. to IEC 60529	IP65 / IP67, when mated position
Conductor cross-section	0.34 mm ² , 014 mm ²
Conductor cross-section	AWG 22 ... AWG 26,
Cable diameter	5.7 ... 8.8 mm
Transmission characteristics	Cat. 5, Class D up to 100 MHz

Technical characteristics

Tightening torque	0.6 Nm
Material (insert)	Polyamid (PA)
Material (hood/housing)	Zinc die-cast
Material (contacts)	copper alloy
Surface (contacts)	Gold plated
RoHS	compliant

Specifications and approvals

IEC 61076-2-101
UL 2238 CYJV2.E302521
CSA-C22.2 No. 182.3 CYJV8.E302521



Details

Suitable for Fast Ethernet only

Identification	Conductor cross-section (mm ²)	Male	Path number Female	Drawing	Dimensions in mm
Rundsteckverbinder M12, Slim Design, Cable connector, straight, HARAX® connection technology, Shielded	0.14	21 03 382 1410	21 03 382 2410		
	0.34	21 03 382 1400	21 03 382 2400		

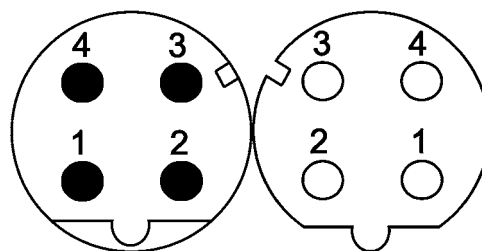


Number of contacts

4

Crimp termination

Shielded



Technical characteristics

Number of contacts	4
Rated current	4 A
Rated impulse voltage	1.5 kV
Pollution degree	3
Rated voltage	48 V AC, 60 V DC
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Mating cycles	≥ 500
Wire outer diameter	≤ 2.3 mm
Verriegelungsart	Screw locking, PushPull
Degree of protection acc. to IEC 60529	IP65 / IP67, when mated position
Conductor cross-section	0.13 ... 0.82 mm ² . 0.09 ... 0.25 mm ² . 0.13 ... 0.33 mm ² . 0.25 ... 0.52 mm ² . 0.33 ... 0.82 mm ²
Conductor cross-section	AWG 26 ... AWG 18, AWG 28 ... AWG 24, AWG 26 ... AWG 22, AWG 24 ... AWG 20, AWG 22 ... AWG 18

Technical characteristics

Cable diameter	5.7 ... 8.8 mm
Transmission characteristics	Cat. 5, Class D up to 100 MHz
Tightening torque	0.6 Nm, 2 Nm Lock nut
Material (insert)	Liquid crystal polymer (LCP)
Material (hood/housing)	Zinc die-cast
Surface (contacts)	copper alloy
RoHS	compliant, compliant with exemption

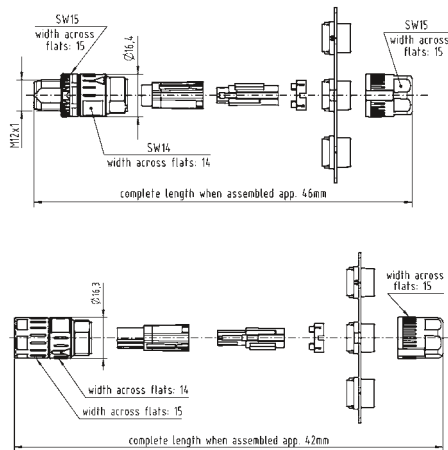
Specifications and approvals

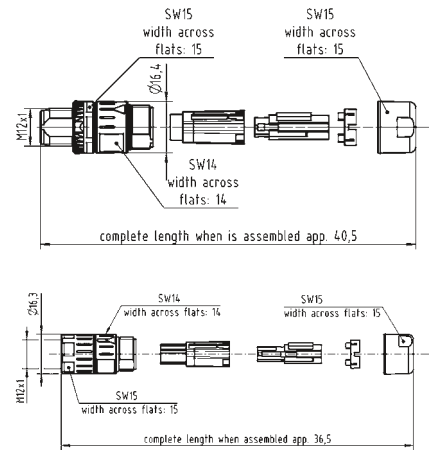
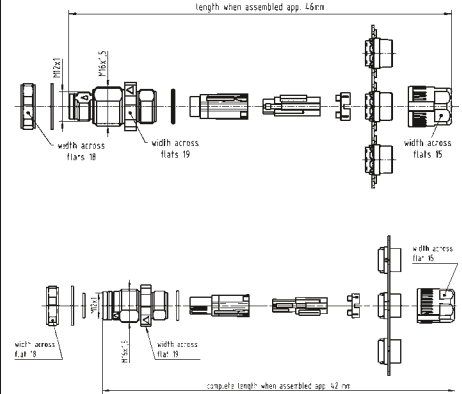
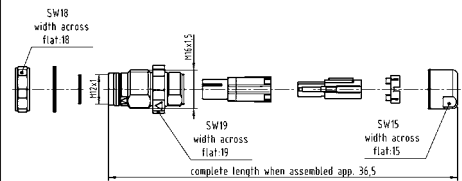
IEC 61076-2-101
UL 2238 CYJV2.E302521
CSA-C22.2 No. 182.3 CYJV8.E302521



Details

Suitable for Fast Ethernet only

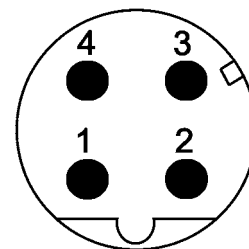
Identification	Conductor cross-section (mm²)	Male	Path number	Female	Drawing	Dimensions in mm
Circular connectors M12, Slim Design, Cable connector, straight, Crimp termination, shielded  Please order crimp contacts separately.	0.13 ... 0.82	21 03 881 1405	21 03 881 2405			

Identification	Conductor cross-section (mm ²)	Male	Path number Female	Drawing	Dimensions in mm
Circular connectors M12, Slim Design, Cable connector, Straight, Crimp termination, Shielded, Shield connection with crimpflange  Please order crimp contacts separately. Please order crimp flange set separately.	0.13 ... 0.82	21 03 881 1407	21 03 881 2407	 Technical drawing showing two views of the M12 Slim Design cable connector assembly. The top view shows the connector with dimensions: SW15 width across flats: 15, SW14 width across flats: 14, and complete length when assembled app. 40,5. The bottom view shows the connector with dimensions: SW14 width across flats: 14, SW15 width across flats: 15, and complete length when assembled app. 36,5.	
Circular connectors M12, M12 Slim Design, Cable connector, Panel feed through, for rear mounting, Crimp termination, Shielded  Please order crimp contacts separately.	0.13 ... 0.82	21 03 881 1426	21 03 881 2425	 Technical drawing showing two views of the M12 Slim Design panel feed through connector assembly. The top view shows the connector with dimensions: length when assembled app. 46mm, width across flats 18, width across flats 19, and width across flats 15. The bottom view shows the connector with dimensions: width across flats 18, width across flats 19, and complete length when assembled app. 42 mm.	
Circular connectors M12, Slim Design, Cable connector, Panel feed through, for rear mounting, Crimp termination, Shielded, Shield connection with crimp flange  Please order crimp contacts separately. Please order crimp flange set separately.	0.13 ... 0.82		21 03 881 2427	 Technical drawing showing two views of the M12 Slim Design panel feed through connector assembly. The top view shows the connector with dimensions: SW18 width across flats: 18, SW19 width across flats: 19, and SW15 width across flats: 15. The bottom view shows the connector with dimensions: width across flats 18, width across flats 19, and complete length when assembled app. 36,5.	

Conductor cross-section	Ø	Stripping length
0.09-0.25 mm²	0.64	4 mm
0.13-0.33 mm²	0.88	4 mm
0.25-0.52 mm²	1.13	4 mm
0.33-0.82 mm²	1.34	4 mm
for stranded wire according IEC 60228 Class 5		

Number of contacts

4



preLink® insulation displacement termination
Shielded

Technical characteristics

Number of contacts	4
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 500
Locking type	Screw locking
Degree of protection acc. to IEC 60529	IP65 / IP67
Conductor cross-section	0.1 ... 0.12 mm², 0.22 ... 0.32 mm²
Conductor cross-section	AWG 27 ... AWG 26, AWG 24 ... AWG 22
Cable diameter	5 ... 9.5 mm
Transmission characteristics	Cat. 5, Class D up to 100 MHz
Data rate	10 Mbit/s, 100 Mbit/s

Technical characteristics

Material (hood/housing)	Zinc die-cast
Surface (hood/housing)	Nickel plated
RoHS	compliant with exemption

Specifications and approvals

UL 1863 DUXR2.E470046
CSA-C22.2 No. 182.4,
No. 233-09 DUXR8.E470046
DNV GL



Details

Suitable for Fast Ethernet only

Identification	Conductor cross-section (mm²)	Path number Male	Drawing	Dimensions in mm
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preLink®, Circular connectors M12,
Screw mounted housing,
Cable connector,
preLink® IDC insulation displacement
termination,
Shielded



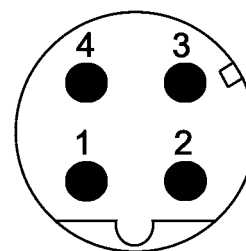
Please order terminal module separately.

0.1 ... 0.12
0.22 ... 0.32

20 82 005 0001

Number of contacts

4



preLink® insulation displacement termination
Shielded

Technical characteristics

Number of contacts	4
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 500
Locking type	Screw locking
Degree of protection acc. to IEC 60529	IP65 / IP67
Conductor cross-section	0.1 ... 0.12 mm², 0.22 ... 0.32 mm²
Conductor cross-section	AWG 27 ... AWG 26, AWG 24 ... AWG 22
Cable diameter	5 ... 9.5 mm
Transmission characteristics	Cat. 5, Class D up to 100 MHz
Data rate	10 Mbit/s, 100 Mbit/s

Technical characteristics

Material (insert)	Zinc die-cast, nickel-plated
Material (hood/housing)	Zinc die-cast
RoHS	compliant with exemption, compliant

Specifications and approvals

UL 1863 DUXR2.E470046
CSA-C22.2 No. 182.4,
No. 233-09 DUXR8.E470046
DNV GL



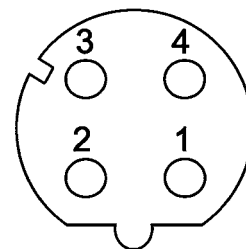
Details

Suitable for Fast Ethernet only

Identification	Conductor cross-section (mm²)	Path number Male	Drawing	Dimensions in mm
preLink®, Circular connectors M12, Connector insert, preLink® IDC insulation displacement termination, Shielded  Please order terminal module separately Please order screw mounted housing separately.	0.1 ... 0.12, 0.22 ... 0.32	20 82 005 1214		
preLink®, Circular connectors M12, Screw mounted housing, Empty housing 	0.1 ... 0.12, 0.22 ... 0.32	20 82 000 1210		

Number of contacts

4

preLink® insulation displacement termination
Shielded

Features

- Ethernet data connector suitable for industry
- Robust design
- 360° shielding
- Category of transmission Cat. 5
- Suitable for termination of massive and flexible wires
- Suitable for all PoE versions
- Very fast preLink® termination technology

Technical characteristics

Conductor cross-section	AWG 27 ... AWG 26, AWG 24 ... AWG 22
Cable diameter	5 ... 9.5 mm
Transmission characteristics	Cat. 5, Class D up to 100 MHz
Data rate	10 Mbit/s, 100 Mbit/s
Material (hood/housing)	Zinc die-cast
Surface (hood/housing)	Nickel plated
RoHS	compliant with exemption

Technical characteristics

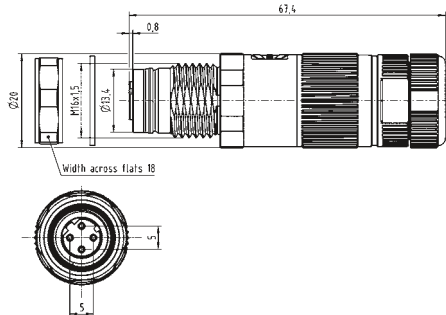
Number of contacts	4
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 500
Locking type	Screw locking, PushPull
Degree of protection acc. to IEC 60529	IP65 / IP67
Conductor cross-section	0.1 ... 0.12 mm², 0.22 ... 0.32 mm²

Specifications and approvals

IEC 61076-2-101
DNV GL

Details

Suitable for Fast Ethernet only

Identification	Conductor cross-section (mm²)	Path number Female	Drawing	Dimensions in mm
preLink®, Circular connectors M12, Cable connector, Panel feed through, for rear mounting, preLink® IDC insulation displacement termination, Shielded  Please order terminal module separately.	0.1 ... 0.12, 0.22 ... 0.32	20 82 005 2001		



preLink® displacement termination

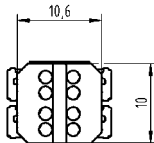
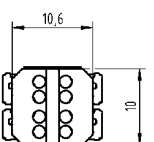
Technical characteristics

Specifications and approvals

Limiting temperature	-40 ... +85 °C	DNV GL	
Mating cycles	≥ 10	UL 1863 DUXR2.E470046	
Wire outer diameter	1.3 ... 1.6 mm, 0.8 ... 1.1 mm	CSA-C22.2 No. 182.4,	
Conductor cross-section	0.22 ... 0.32 mm², 0.1 ... 0.12 mm²	No. 233-09 DUXR8.E470046	
Conductor cross-section	AWG 24 ... AWG 22, AWG 27... AWG 26		
Colour (insert)	Yellow, White, Black		
RoHS	compliant		

Connecting hardware

Identification	Conductor cross-section (mm²)	Path number	Drawing	Dimensions in mm
preLink®, Terminal module, 8-pins, preLink® IDC insulation displacement termination, Conductor diameter 1.3 - 1.6 mm, Pack contents: 10 pieces	0.22 ... 0.32	20 82 000 0001		
preLink®, Terminal module, 8-pins, preLink® IDC insulation displacement termination, Conductor diameter 0,8 - 1,1 mm, Pack contents: 10 pieces	0.1 ... 0.12	20 82 000 0003		

Identification	Conductor cross-section (mm ²)	Path number	Drawing	Dimensions in mm
preLink®, Terminal module, 4-pin, AIDA compliant, preLink® IDC insulation displacement termination, Conductor diameter 1.3 - 1.6 mm, Pack contents: 10 pieces 	0.22 ... 0.32	20 82 000 0005	  	
preLink®, Terminal module, AIDA compliant, preLink® IDC insulation displacement termination, Conductor diameter 1.3 - 1.6 mm, Pack contents: 100 pieces 	0.22 ... 0.32	20 82 000 0005 XL	  	



Technical characteristics

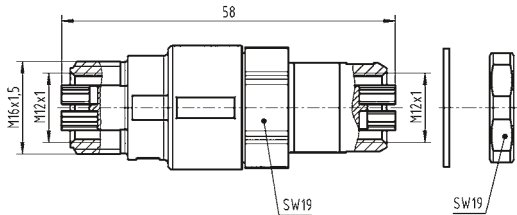
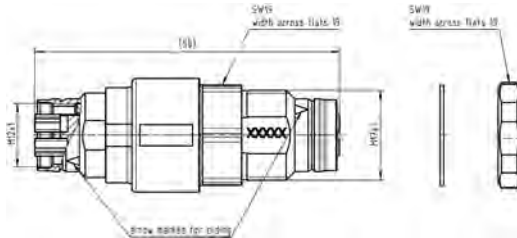
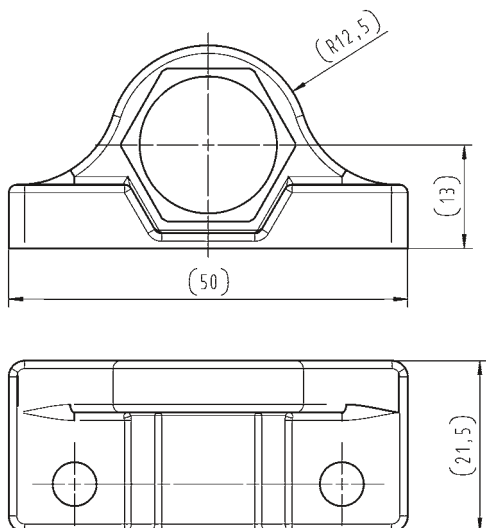
Locking type	PushPull, Screw locking
Material (accessories)	Thermoplastic
Colour (accessories)	Black
RoHS	compliant with exemption, compliant

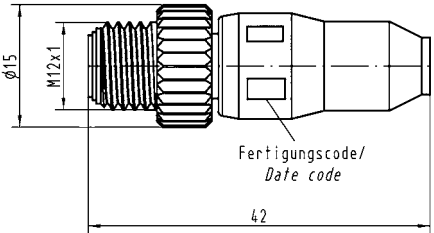
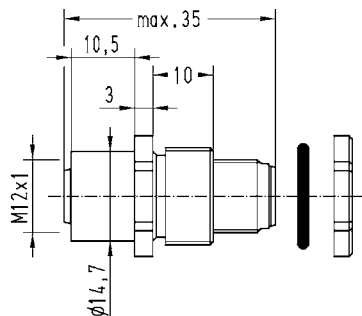
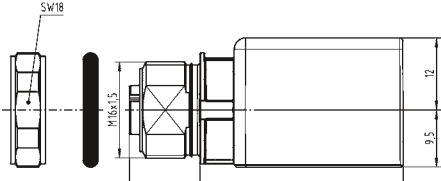
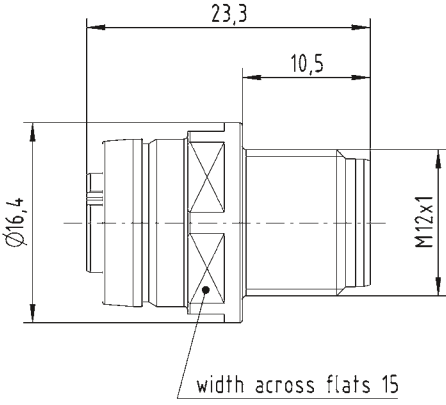
Specifications and approvals

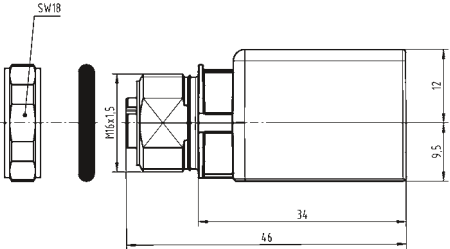
UL 2238 CYJV2.E302521
CSA-C22.2 No. 182.3 CYJV8.E302521



Identification	Path number Female	Drawing	Dimensions in mm
Circular connectors M12, Gender Changer, D-Kodierung, 4-polig, Kat. 5	21 03 381 6401		
Circular connectors M12, Gender Changer, D-Kodierung, 4- / 8-polig	21 03 381 6402		
Circular connectors M12, Gender Changer, D-Kodierung, mit PushPull, 4-polig, Kat. 5	21 03 381 6403		
Circular connectors M12, Gender Changer, D-Kodierung / X-Kodierung, mit PushPull, 4- / 8-polig	21 03 381 6404		

Identification	Path number Female	Drawing	Dimensions in mm
Circular connectors M12, Gender changer, X-coding, Cat. 6_A 	21 03 381 6815		
Circular connectors M12, Gender changer, X-coding, With PushPull, Cat. 6_A 	21 03 381 6816		
Circular connectors M12, Panel mounting parts 	21 01 000 0036		

Identification	Path number		Drawing	(dimensions in mm)
	Male	Female		
Circular connectors M12, M12-male moving load, B-coding 	21 03 030 1300			
Circular connectors M12, M12-male/female panel feed through, B-coding 		21 03 330 1300		
Circular connectors M12, M12 female-RJ45 panel feed through, D-coding, 4-pin, Straight 		21 03 381 2401		
Circular connectors M12, M12 PushPull adapter, D-coding, 4-pin 		21 03 381 2403		

Identification	Path number		Drawing	(dimensions in mm)
	Male	Female		
Circular connectors M12, M12 female-RJ45 panel feed through, D-coding, 4-pin, Angled 		21 03 381 4401		

Identification

Part number

Drawing

Crimping tool
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

AWG 24-20/0.25-0.52 mm²

AWG 26-22/0.13-0.33 mm²

AWG 28-24/0.09-0.25 mm²



turned female contacts

AWG 22-18/0.33-0.82 mm²

AWG 24-20/0.25-0.52 mm²

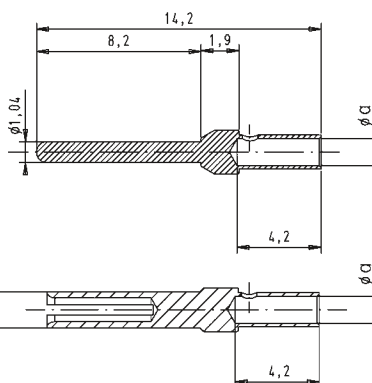
AWG 26-22/0.13-0.33 mm²

AWG 28-24/0.09-0.25 mm²



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

M12
dynamometric screwdriver

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 Slim Design

for 4.5 - 8.8 mm cable Ø

for 5.7 - 8.8 mm cable Ø

21 01 010 2038

21 01 010 2028

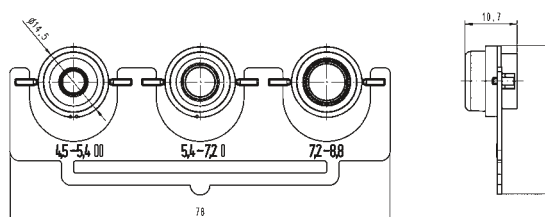
Set of seals M12-L shielded

for 4.5 - 5.4 mm cable Ø

for 5.4 - 7.2 mm cable Ø

for 7.2 - 8.8 mm cable Ø

21 01 010 2017



Accessories M12

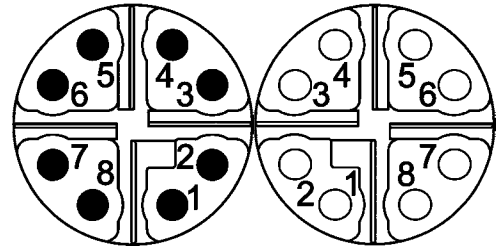
Lock nut

21 01 000 0018



Number of contacts

8

Crimp termination
Shielded

Technical characteristics

Number of contacts	8
Rated current	0.5 A
Rated voltage	48 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Mating cycles	≥ 500
Wire outer diameter	≤ 1.4 mm
Locking type	Screw locking, PushPull
Degree of protection acc. to IEC 60529	IP65 / IP67, when mated
Conductor cross-section	0.08 ... 0.25 mm ² , 0.13 ... 0.25 mm ² , 0.08 ... 0.22 mm ²
Conductor cross-section	AWG 28 ... AWG 23, AWG 26 ... AWG 23, AWG 28 ... AWG 24
Cable diameter	5.7 ... 8.8 mm,

Technical characteristics

Transmission characteristics	Cat. 6A, Class EA up to 500 MHz
Tightening torque	0.6 Nm, 2 Nm Lock nut
Material (insert)	Liquid crystal polymer (LCP)
Material (hood/housing)	Zinc die-cast
Material (contacts)	Copper alloy
Surface (contacts)	Gold plated
RoHS	compliant, compliant with exemption

Specifications and approvals

IEC 61076-2-109
UL 2238 CYJV2.E302521
CSA-C22.2 No. 182.3 CYJV8.E302521

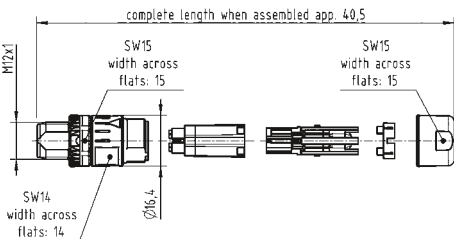
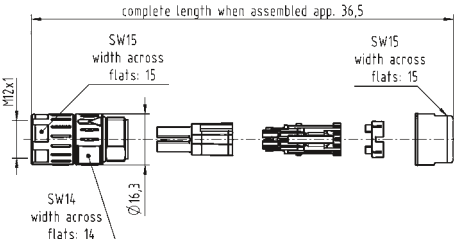
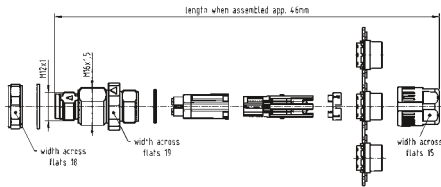
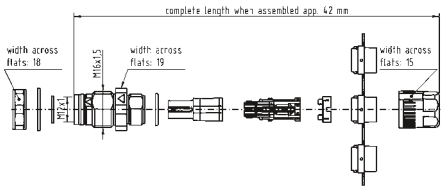
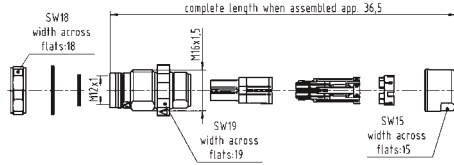


Details

Suitable for 10 Gbit Ethernet only

Connecting hardware

Identification	Conductor cross-section (mm ²)	Male	Path number	Female	Drawing	Dimensions in mm
Circular connectors M12, Cable connector, Straight, Crimp termination, Shielded	0.08 ... 0.25	21 03 881 1805		21 03 881 2805		Please order crimp contacts separately.

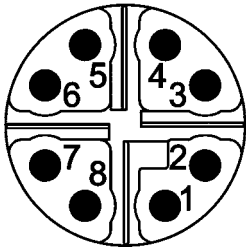
Identification	Conductor cross-section (mm ²)	Male	Path number	Female	Drawing	Dimensions in mm
Circular connectors M12, M12 Slim Design, Cable connector, Straight, Crimp termination, Shielded, Shield connection with crimp flange  Please order crimp contacts separately. Please order crimp flange set separately.	0.08 ... 0.25	21 03 881 1807		21 03 881 2807	 	complete length when assembled app. 40,5 SW15 width across flats: 15 SW14 width across flats: 14 Ø16,4 M12x1 complete length when assembled app. 36,5 SW15 width across flats: 15 SW14 width across flats: 14 Ø16,3 M12x1
Circular connectors M12, M12 Slim Design, Cable connector, Panel feed through, for rear mounting, Crimp termination, Shielded  Please order crimp contacts separately.	0.08 ... 0.25	21 03 881 1825		21 03 881 2825	 	length when assembled app. 45mm width across flats 18 M12x1 width across flats 19 width across flats 15 complete length when assembled app. 42 mm width across flats 18 M12x1 width across flats 19 width across flats 15
Circular connectors M12, M12 Slim Design, Cable connector, Panel feed through, for rear mounting, Crimp termination, Shielded, Shield connection with crimp flange  Please order crimp contacts separately. Please order crimp flange set separately.	0.08 ... 0.25			21 03 881 2827		complete length when assembled app. 36,5 SW18 width across flats: 18 M12x1 SW19 width across flats: 19 SW15 width across flats: 15 M12x1,5

Identification	Conductor cross-section (mm ²)	Male	Female	Drawing	Dimensions in mm
Circular connectors M12, M12 Slim Design, Cable connector, Angled, Crimp termination, Shielded	0.08 ... 0.25	21 03 881 3805	21 03 881 4805		
Please order crimp contacts separately.					
Circular connectors M12, M12 Slim Design, Cable connector, Angled, Crimp termination, Shielded, Shield connection with crimp flange	0.08 ... 0.25	21 03 881 3807	21 03 881 4807		
Please order crimp contacts separately. Please order crimp flange set separately.					
har-speed, Crimp contact, Turned contacts	0.08 ... 0.22 0.13 ... 0.25	21 01 100 9014 21 01 100 9019	21 01 100 9023 21 01 100 9021		



Number of contacts

8



preLink® displacement termination
Shielded

Technical characteristics

Number of contacts	8
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 500
Locking type	Screw locking
Degree of protection acc. to IEC 60529	IP65 / IP67
Conductor cross-section	0.1 ... 0.12 mm², 0.22 ... 0.32 mm²
Conductor cross-section	AWG 27 ... AWG 26, AWG 24 ... AWG 22
Cable diameter	5 ... 9.5 mm
Transmission characteristics	Cat. 6A, Class EA up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2.5 Gbit/s, 5 Gbit/s, 10 Gbit/s

Technical characteristics

Material (hood/housing)	Zinc die-cast
Surface (hood/housing)	Nickel plated
RoHS	compliant with exemption

Specifications and approvals

UL 1863 DUXR2.E470046 CSA-C22.2 No. 182.4, No. 233-09 DUXR8.E470046 DNV GL	
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Details

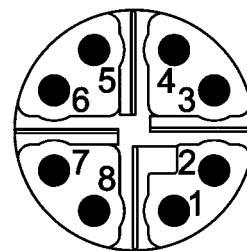
Suitable for 10 Gbit Ethernet only

Identification	Conductor cross-section (mm²)	Path number Male	Drawing	Dimensions in mm
preLink®, Circular connectors M12, Einschraubgehäuse, Screw mounted housing, Cable connector, preLink® IDC insulation displacement termination, Shielded  Please order terminal module separately.	0.1 ... 0.12 0.22 ... 0.32	20 82 005 0002		

Connecting hardware

Number of contacts

8



preLink® displacement termination
Shielded

Technical characteristics

Number of contacts	8
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 500
Locking type	Screw locking
Degree of protection acc. to IEC 60529	IP65 / IP67
Conductor cross-section	0.1 ... 0.12 mm², 0.22 ... 0.32 mm²
Conductor cross-section	AWG 27 ... AWG 26, AWG 24 ... AWG 22
Cable diameter	5 ... 9.5 mm
Transmission characteristics	Cat. 6A, Class EA up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2.5 Gbit/s, 5 Gbit/s, 10 Gbit/s

Technical characteristics

Material (insert)	Zinc die-cast, nickel-plated
Material (hood/housing)	Zinc die-cast
RoHS	compliant with exemption, compliant

Specifications and approvals

UL 1863 DUXR2.E470046
CSA-C22.2 No. 182.4,
No. 233-09 DUXR8.E470046
DNV GL



Details

Suitable for 10 Gbit Ethernet only

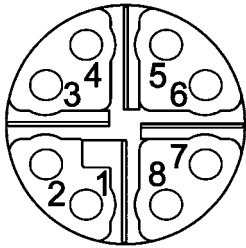
Connecting
hardware

Identification	Conductor cross-section (mm²)	Path number Male	Drawing	Dimensions in mm
preLink®, Circular connectors M12, Connector insert, preLink® IDC insulation displacement termination, Shielded  Please order terminal module separately Please order screw mounted housing separately.	0,1 ... 0,12, 0,22 ... 0,32	20 82 006 1218		
preLink®, Rundsteckverbinder M12, Screw mounted housing, Empty housing 	0,1 ... 0,12, 0,22 ... 0,32	20 82 000 1210		



Number of contacts

8



preLink® displacement termination
Shielded

Features

- Ethernet data connector suitable for industry
- Robust design
- 360° shielding
- Category of transmission Cat. 6A
- Suitable for termination of massive and flexible wires
- Suitable for all PoE versions
- Very fast preLink® termination technology

Technical characteristics

Conductor cross-section	AWG 27 ... AWG 26, AWG 24 ... AWG 22
Cable diameter	5 ... 9.5 mm
Transmission characteristics	Cat. 6A, Class EA up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2.5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Material (hood/housing)	Zinc die-cast
Surface (hood/housing)	Nickel plated
RoHS c	ompliant with exemption

Technical characteristics

Number of contacts	8
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 500
Locking type	Screw locking, PushPull
Degree of protection acc. to IEC 60529	IP65 / IP67
Conductor cross-section	0.1 ... 0.12 mm², 0.22 ... 0.32 mm²

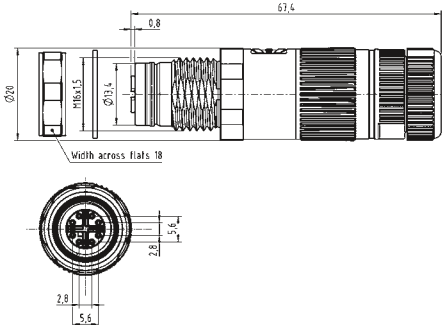
Specifications and approvals

IEC 61076-2-109
DNV GL



Details

Suitable for 10 Gbit Ethernet only

Identification	Conductor cross-section (mm²)	Part number Female	Drawing	Dimensions in mm
preLink®, Circular connectors M12, Cable connector, Panel feed through, for rear mounting, preLink® IDC insulation displacement termination, Shielded  Please order terminal module separately.	0.1 ... 0.12, 0.22 ... 0.32	20 82 006 2001		



preLink® displacement termination

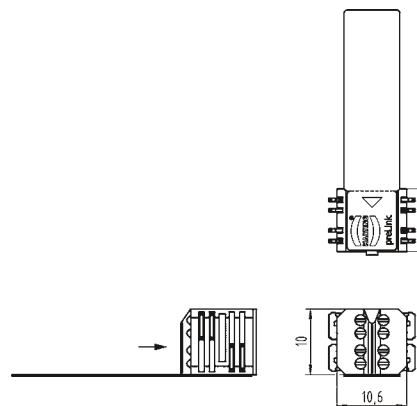
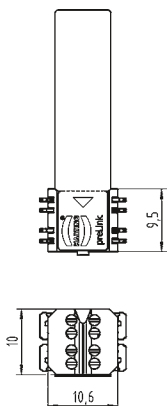
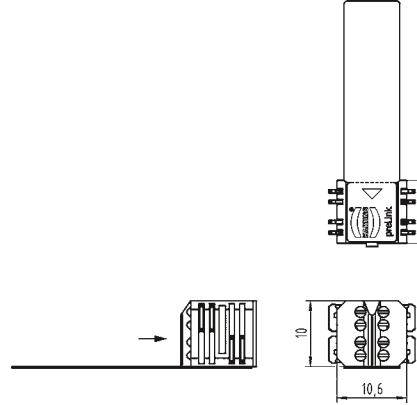
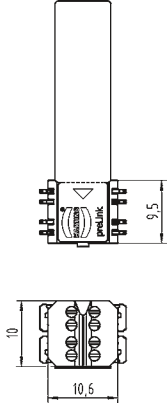
Technical characteristics

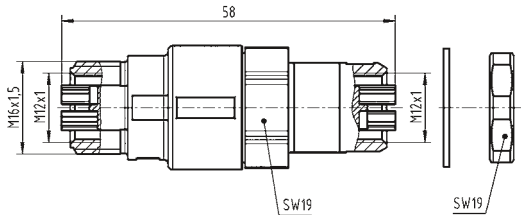
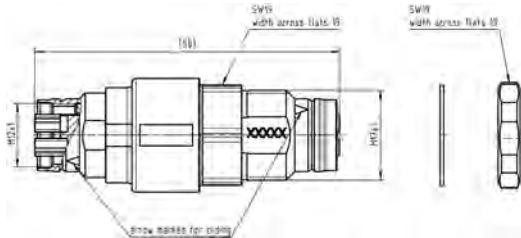
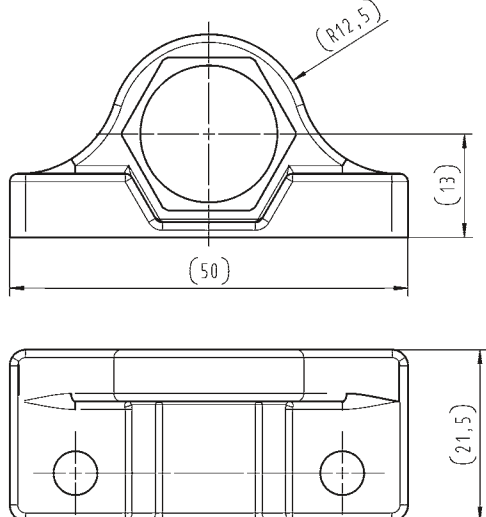
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 10
Wire outer diameter	1.3 ... 1.6 mm, 0.8 ... 1.1 mm
Conductor cross-section	0.22 ... 0.32 mm ² , 0.1 ... 0.12 mm ²
Conductor cross-section	AWG 24 ... AWG 22, AWG 27... AWG 26
Colour (insert)	Yellow, White, Black
RoHS	compliant

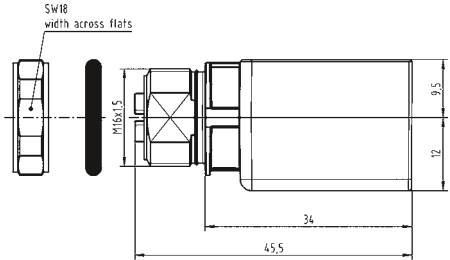
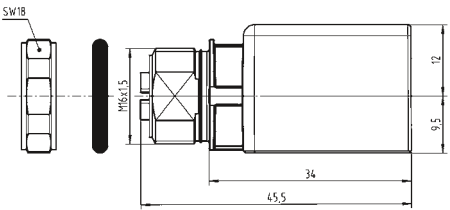
Specifications and approvals

DNV GL
UL 1863 DUXR2.E470046
CSA-C22.2 No. 182.4,
No. 233-09 DUXR8.E470046



Identification	Conductor cross-section (mm ²)	Path number	Drawing	Dimensions in mm
preLink®, Terminal module, 8-pins, preLink® IDC insulation displacement termination, Conductor diameter 1.3 - 1.6 mm, Pack contents: 10 pieces 	0.22 ... 0.32	20 82 000 0001		
preLink®, Terminal module, 8-pins, preLink® IDC insulation displacement termination, Conductor diameter 0.8 - 1.1 mm, Pack contents: 10 pieces 	0.1 ... 0.12	20 82 000 0003		

Identification	Path number Female	Drawing	Dimensions in mm
Circular connectors M12, Gender changer, X-coding, Cat. 6_A 	21 03 381 6815		
Circular connectors M12, Gender changer, X-coding, With PushPull, Cat. 6_A 	21 03 381 6816		
Circular connectors M12, Panel mounting parts 	21 01 000 0036		

Identification	Path number		Drawing	Dimensions in mm
	Male	Female		
Circular connectors M12, <i>har</i>-speed M12 adapter M12-RJ45, X-coding, Straight, Cat. 6A 		21 03 381 2800		
Circular connectors M12, <i>har</i>-speed M12 adapter M12-RJ45, X-coding, Angled, Cat. 6A 		21 03 381 4800		

Identification

Part number

Drawing

Crimping tool
for *har-speed* M12

09 99 000 0501



Accessories *har-speed* M12

Locator

09 99 000 0525



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

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

Accessories M12

Lock nut

21 01 000 0018



M12
dynamometric screwdriver

Tightening torque 0.6 Nm

for M12 Slim design SW 15

09 99 000 0646



Technical characteristics

Degree of protection
acc. to IEC 60529 IP65 / IP67

Material (accessories) Thermoplastic

Technical characteristics

Colour (accessories) Black

RoHS compliant

Identification

Part number

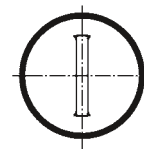
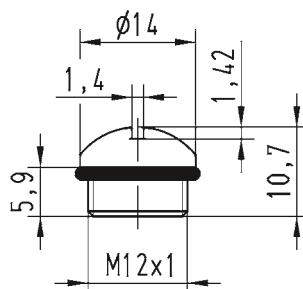
Drawing

Dimensions in mm

Circular connectors M12,
Cap,
IP65 / IP67



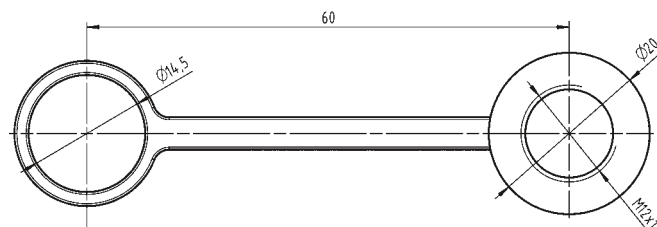
21 01 000 0003



Circular connectors M12,
Cap,
for male inserts,
with cord,
IP67



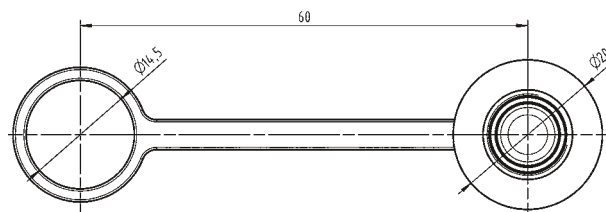
21 41 000 0001



Circular connectors M12,
Cap,
for female inserts,
with cord,
IP67



21 41 000 0002



Technical characteristics

Degree of protection
acc. to IEC 60529

IP65 / IP67

Technical characteristics

Material (accessories)

Metal

RoHS

compliant with exemption

Identification

Part number

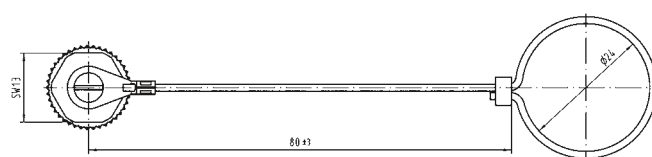
Drawing

Dimensions in mm

Circular connectors M12,

Cap,
for female inserts,
with cord

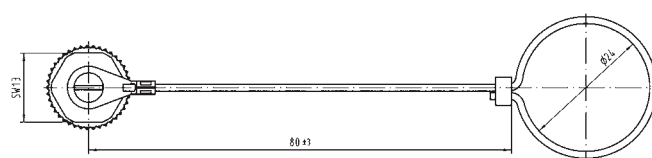
21 01 000 0030



Circular connectors M12,

Cap,
for female inserts,
with cable clip

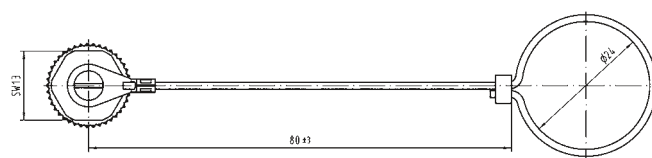
21 01 000 0031



Circular connectors M12,

Cap,
for male inserts,
with cord

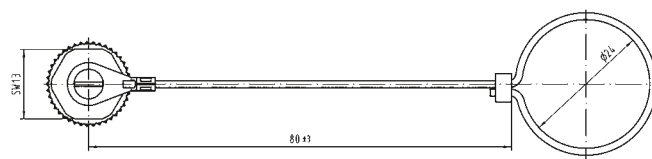
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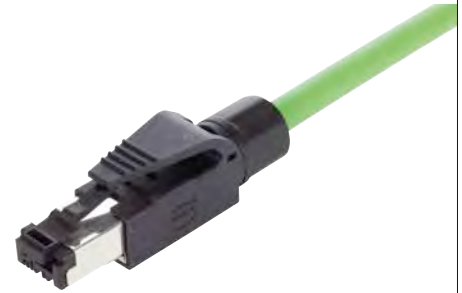


Circular connectors M12,

Cap,
for male inserts,
with cable clip

21 01 000 0038





HARTING RJ Industrial® connector set RJ45, 4 poles

Advantages

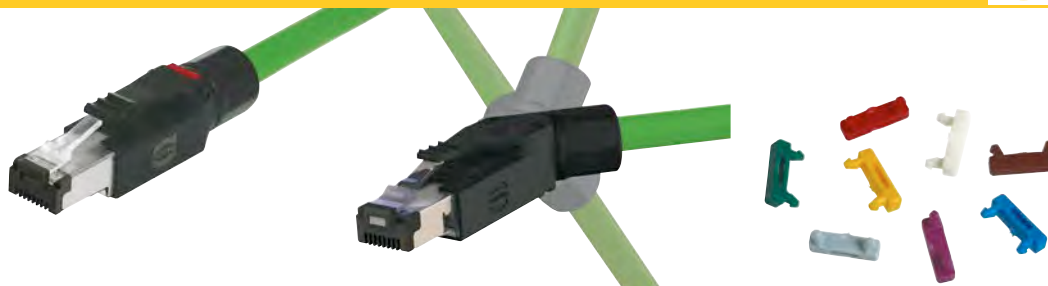
- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Compact design
- Ergonomical unlocking clip
- Less weight assures shock- and vibration-resisting connection
- Category of transmission Cat. 5
- Suitable for termination 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 60603-7
Number of contacts	4
Transmission performance	Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 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) AWG 23/1 ... AWG 22/1 (solid) AWG 26/7 (09 45 151 1109)
- Conductor diameter	max. 1.6 mm (09 45 151 1100/09 45 151 1108) max. 1.2 mm (09 45 151 1109)
- 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
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® connector set RJ45, 4 poles incl.: housing with shielding, splicing element, cable gland and instruction manual like 09 45 151 1100 but for AWG 26	09 45 151 1100 09 45 151 1108¹⁾ 09 45 151 1109	Mating face acc. to IEC 60603-7 Max. 60 13,97 maxi 11,3 10,3 7,7 contact N°6 contact N°3 contact N°1 contact N°2	

¹⁾ Packaging with 100 sets



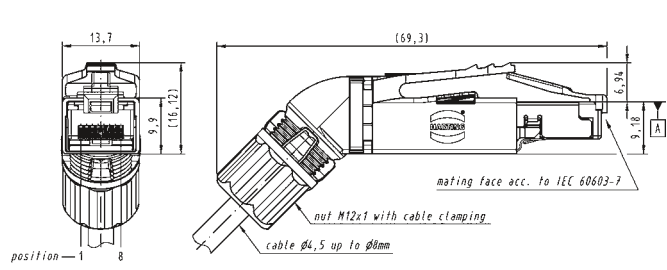
HARTING RJ Industrial® PN connector set RJ45, 4 poles

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. 5e
- 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 5e, Class D, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 5e, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 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) 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	White	09 45 850 0001
If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.	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



HARTING RJ Industrial® PN Compact connector set, 4 poles

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- 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 60603-7
Number of contacts	4
Transmission performance	Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	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

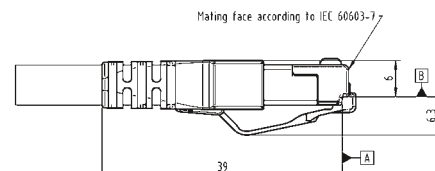
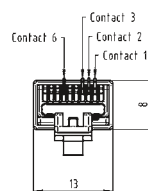
HARTING RJ Industrial®
PN Compact connector set, 4
poles

Compact version

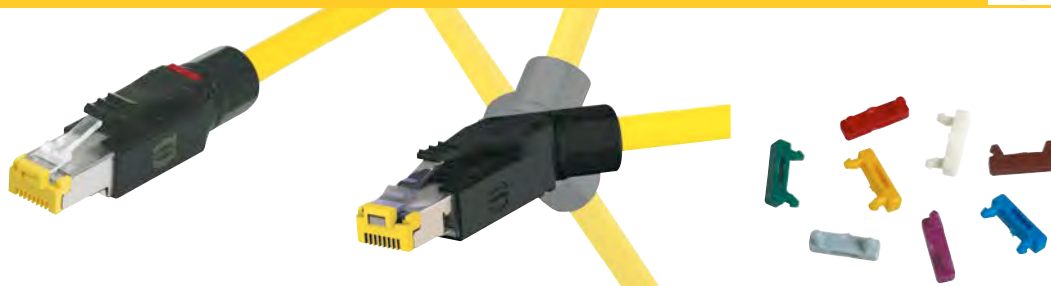
09 45 151 1130¹⁾

Assembly tool

09 45 800 0530



¹⁾ Packaging with 100 sets



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, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 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) 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
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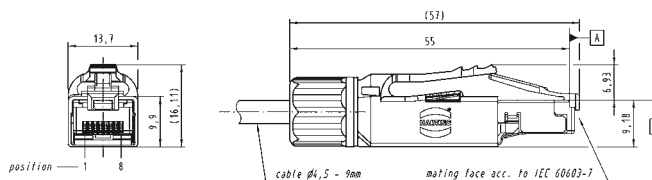
HARTING RJ Industrial® 10G connector set RJ45, 8 poles

straight version

09 45 151 1560
09 45 151 1560 XL¹⁾

45° angled version
(four different cable outlets possible)

09 45 151 1561



Identification	Colour	Part number
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Colour clips for colour coding the HARTING RJ Industrial® 10G connector

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



HARTING RJ Industrial® Gigalink connector set RJ45, 8 poles

Advantages

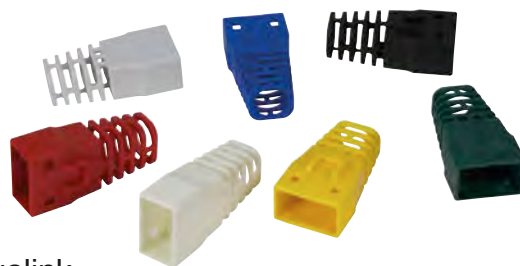
- RJ45 Ethernet-Data connector suitable for industry
- Assembly with piercing contacts
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 6_A
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	8
Transmission performance	Category 6 _A , Class E _A up to 500 MHz acc. to ISO/IEC 11 801, EN 50 173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	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	4.5 ... 9 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C ... +70 °C
Housing material	polycarbonate, UL 94-V0
Colour	Black, yellow
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® Gigalink Cat. 6_A connector set RJ45, 8 poles incl.: housing with shielding, cable gland and instruction manual Assembly tool for 09 45 151 1520 Compact version Assembly tool for 09 45 151 1525	09 45 151 1520 09 45 151 1520 XL ¹⁾ 09 45 800 0520 09 45 151 1525 ¹⁾ 09 45 800 0025	 	

¹⁾ Packaging with 100 sets



HARTING RJ Industrial® Gigalink connector set RJ45, 8 poles

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- 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)

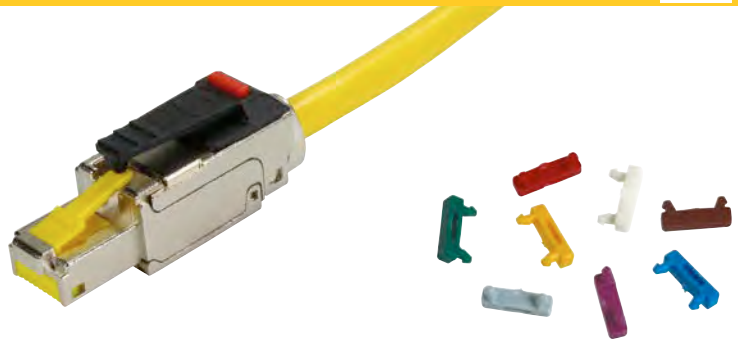
Technical characteristics

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, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	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	5.0 ... 6.5 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® Gigalink Cat. 6 _A Compact connector set RJ45, 8 poles without cable grommet	09 45 151 1524 ¹⁾		
Suitable assembly tool	09 45 800 0025		
Cable grommet			
yellow	09 45 151 0010 ¹⁾		
green	09 45 151 0021 ¹⁾		
black	09 45 151 0022 ¹⁾		
light grey	09 45 151 0023 ¹⁾		
red	09 45 151 0024 ¹⁾		
white	09 45 151 0025 ¹⁾		
blue	09 45 151 0026 ¹⁾		

¹⁾ Packaging with 100 sets



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

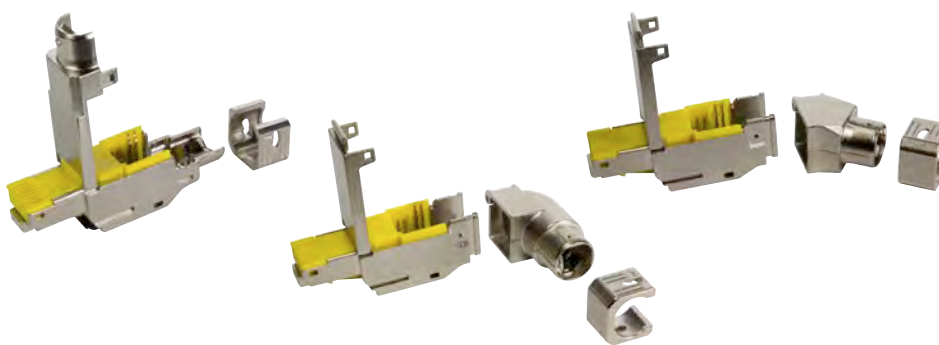
Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission performance	Category 6 _A , Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	preLink® 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
preLink® RJ45 connector	20 82 101 0010		
preLink® RJ45 terminal module			
AWG 22/23, yellow ¹⁾	20 82 000 0001		
AWG 26/27, white ¹⁾	20 82 000 0003		
AWG 22/23, black ¹⁾ , 4 poles	20 82 000 0005		
AWG 22/23, black ²⁾ , 4 poles	20 82 000 0005 XL		
preLink® assembly tool	20 82 000 9901		

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

¹⁾ Packaging with 10 pieces

²⁾ Packaging with 100 pieces



preLink® RJ45 connector

Advantages

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

Technical characteristics

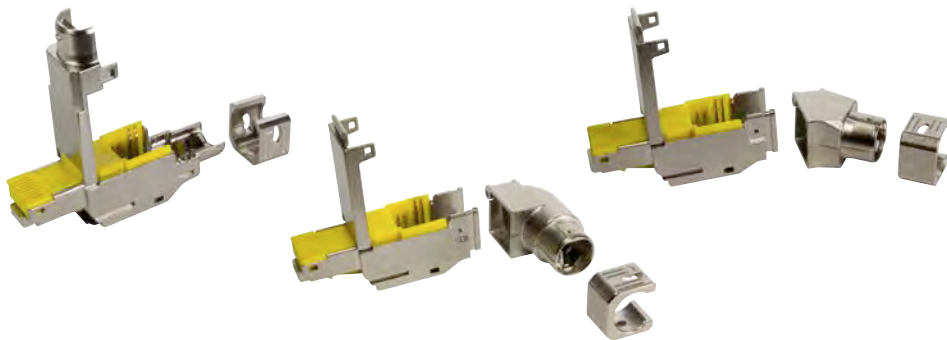
Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6A, Class EA, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6A, Class EA up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	preLink® 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
preLink® RJ45 terminal module			
AWG 22/23, yellow ¹⁾	20 82 000 0001		
AWG 26/27, white ¹⁾	20 82 000 0003		
AWG 22/23, black ¹⁾ , 4 poles	20 82 000 0005		
AWG 22/23, black ²⁾ , 4 poles	20 82 000 0005 XL		
preLink® assembly tool	20 82 000 9901		

¹⁾ Packaging with 10 pieces

²⁾ Packaging with 100 pieces

RJ45 IP20 connectors



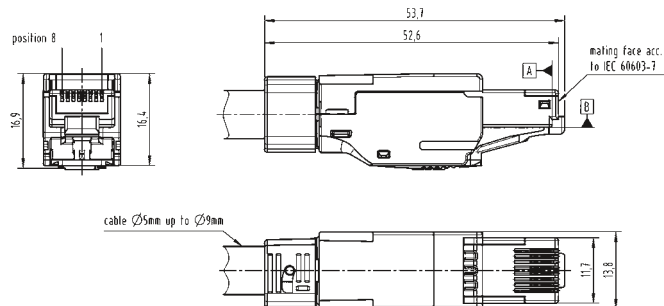
preLink® RJ45 connector

Identification	Part number	Drawing	Dimensions in mm
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preLink® RJ45 connector

IP20 Kat. 6_A L-0°

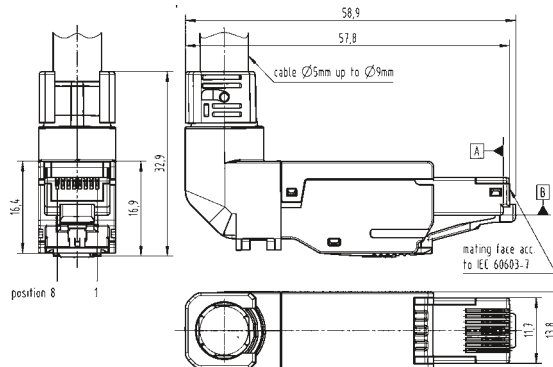
20 82 101 0020



preLink® RJ45 connector

IP20 Kat. 6_A L-90°

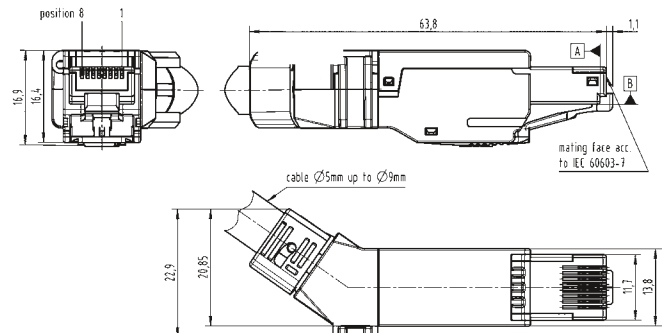
20 82 101 0021



preLink® RJ45 connector

IP20 Kat. 6_A L-30°

20 82 101 0022



Number of contacts

4



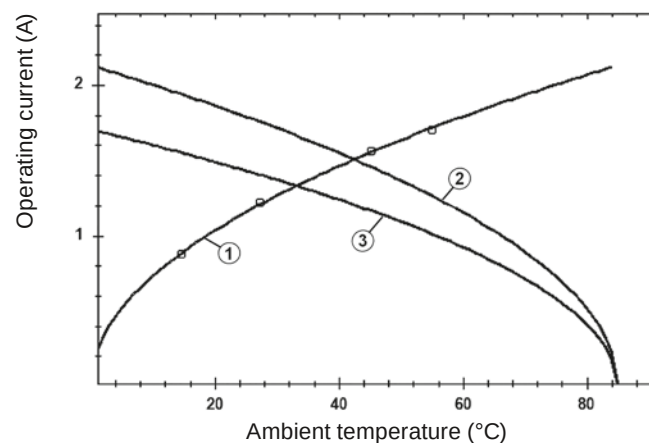
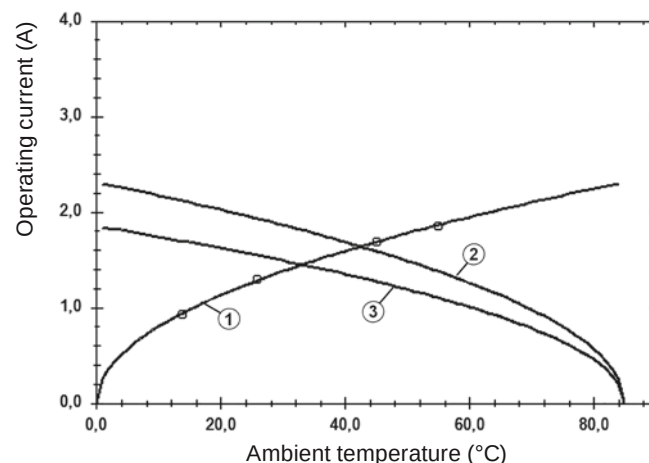
Features

- Very robust full metal housing
- Wide range IDC for solid and stranded wires from AWG 26 to AWG 22
- No side cutter needed anymore – integrated cutting blades behind the IDC contacts cut the wires to the correct length
- Very robust and patent pending cable fixing
- 35° + 90° angled version with variable cable outlet in 4 different cable outlet directions
- Simple mounting
- Suitable for all PoE versions

Technical characteristics

Rated current	1.76 A
Rated voltage	50 V AC, 60 V DC
Transmission characteristics	Cat. 5, Class D up to 100 MHz
Data rate	10 Mbit/s, 100 Mbit/s
Test voltage U_{DC}	1 kV (contact-contact) 1.5 kV (contact-ground)
Insulation resistance	$> 5 \times 10^9 \Omega$
Contact resistance	$\leq 20 \text{ m}\Omega$
Contact resistance, shielding	$\leq 100 \text{ m}\Omega$
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 750
Conductor cross-section	0.12 ... 0.32 mm ² Stranded 0.12 ... 0.32 mm ² Solid
Conductor cross-section	AWG 26/7 ... AWG 22/7 Stranded AWG 26/1 ... AWG 22/1 Solid
Wire outer diameter	0.8 ... 1.6 mm
Degree of protection acc. to IEC 60529	IP20
Cable diameter	4.5 ... 9 mm
Insertion force	$\leq 25 \text{ N}$
Withdrawal force	$\leq 25 \text{ N}$
Material (insert)	Polycarbonate (PC)
Material (hood/housing)	Zinc die-cast
Surface (hood/housing)	Nickel plated
Colour (hood/housing)	Silver
Material (contacts)	Copper alloy
Surface (contacts)	Au over Ni, Mating side Tin plated, Termination side
RoHS	compliant with exemption

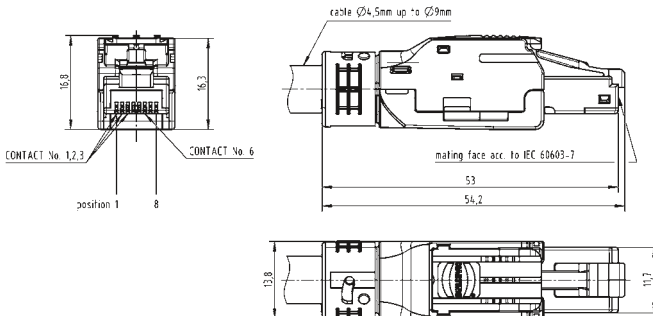
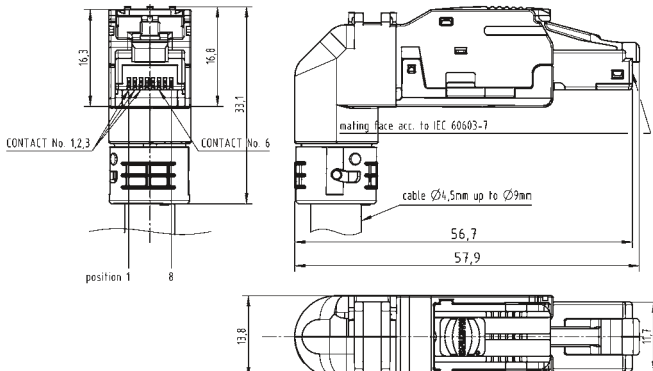
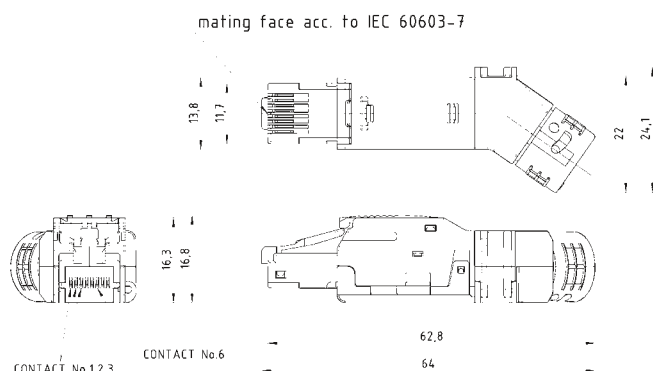
Derating



Specifications and approvals

IEC 60603-7 Mating face
IEC 11801
EN 50173-1
DNV GL



Identification	Part number	Drawing	(dimensions in mm)
HARTING RJ Industrial®, Connector, Multi Feature RJ45, Straight, IDC termination, Fully shielded, 360° shielding contact 	09 45 151 1140		
HARTING RJ Industrial®, Connector, Multi Feature RJ45, 90° angled, IDC termination, Fully shielded, 360° shielding contactt 	09 45 151 1141		
HARTING RJ Industrial®, Connector, Multi Feature RJ45, 35° angled, IDC termination, Fully shielded, 360° shielding contactt	09 45 151 1142		

Number of contacts

8



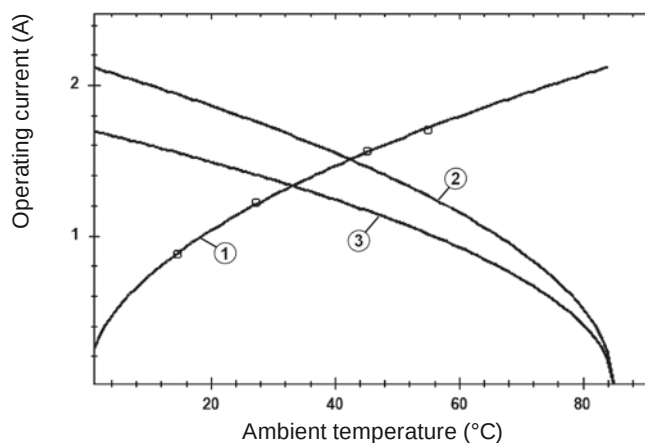
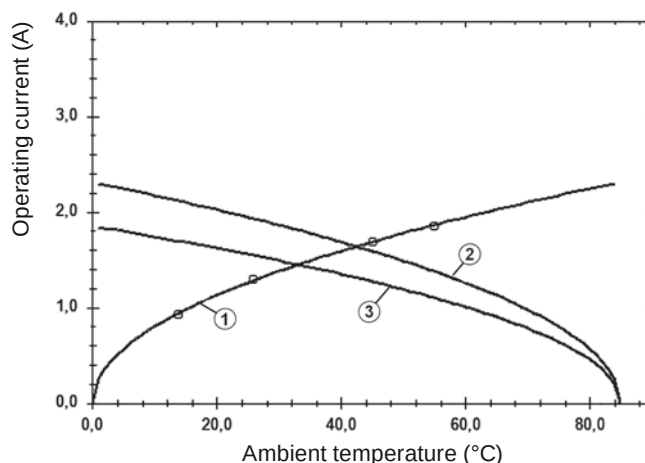
Features

- Very robust full metal housing
- Wide range IDC for solid and stranded wires from AWG 26 to AWG 22
- No side cutter needed anymore – integrated cutting blades behind the IDC contacts cut the wires to the correct length
- Very robust and patent pending cable fixing
- 35° + 90° angled version with variable cable outlet in 4 different cable outlet directions
- Simple mounting
- Suitable for all PoE versions

Technical characteristics

Number of contacts	8
Rated current	1.76 A
Rated voltage	50 V AC, 60 V DC
Transmission characteristics	Cat. 6A, Class E _A up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2.5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Test voltage U _{DC}	1 kV (contact-contact) 1.5 kV (contact-ground)
Insulation resistance	> 5 x 10 ⁹ Ω
Contact resistance	≤ 20 mΩ
Contact resistance, shielding	≤ 100 mΩ
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 750
Conductor cross-section	0.12 ... 0.32 mm ² Stranded 0.12 ... 0.32 mm ² Solid
Conductor cross-section	AWG 26/7 ... AWG 22/7 Stranded AWG 26/1 ... AWG 22/1 Solid
Wire outer diameter	0.8 ... 1.6 mm
Degree of protection acc. to IEC 60529	IP20
Cable diameter	4.5 ... 9 mm
Insertion force	≤ 25 N
Withdrawal force	≤ 25 N
Material (insert)	Polycarbonate (PC)
Material (hood/housing)	Zinc die-cast
Surface (hood/housing)	Nickel plated
Colour (hood/housing)	Silver
Material (contacts)	Copper alloy
Surface (contacts)	Au over Ni, Mating side Tin plated, Termination side
RoHS	compliant with exemption

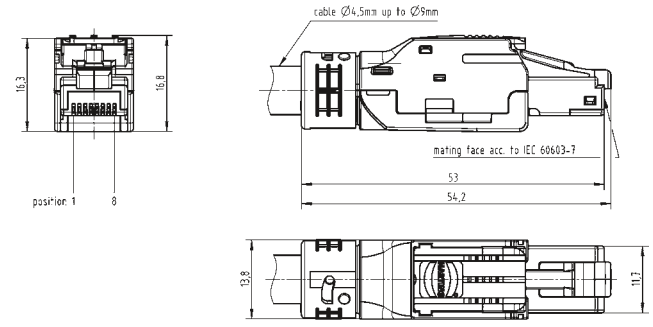
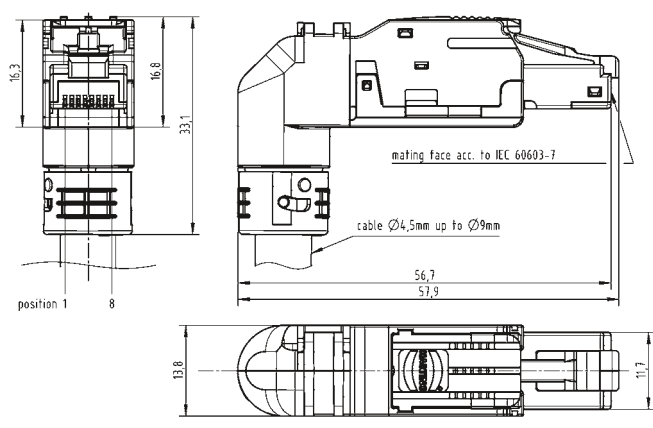
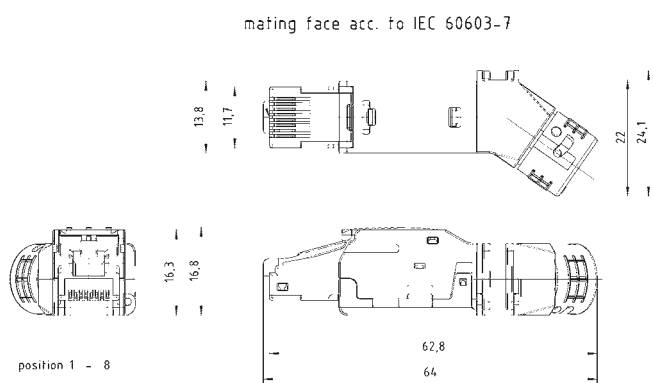
Derating

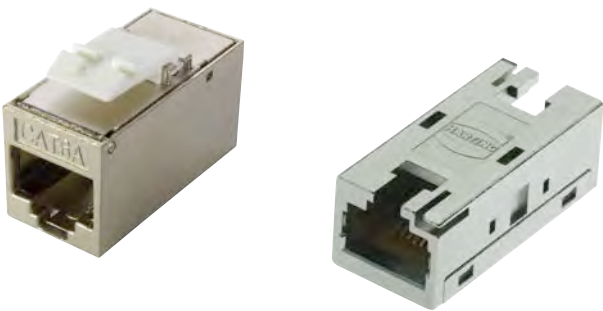


Specifications and approvals

IEC 60603-7 Mating face
IEC 11801
EN 50173-1
DNV GL



Identification	Part number	Drawing	(dimensions in mm)
HARTING RJ Industrial® , Connector, Multi Feature RJ45, Straight, IDC termination, Fully shielded, 360° shielding contact 	09 45 151 1570		
HARTING RJ Industrial® , Connector, Multi Feature RJ45, 90° angled, IDC termination, Fully shielded, 360° shielding contact 	09 45 151 1571		
HARTING RJ Industrial® , Connector, Multi Feature RJ45, 35° angled, IDC termination, Fully shielded, 360° shielding contact 	09 45 151 1572		



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
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

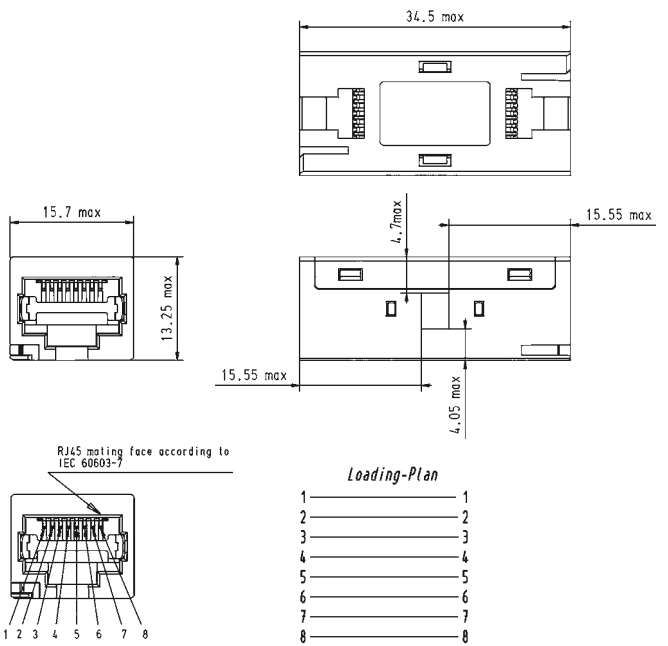
Technical characteristics

Mating face	RJ45 acc. to IEC 60603-7
Number of contacts	8
Transmission performance	Cat. 6, performance Class E _A , 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
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
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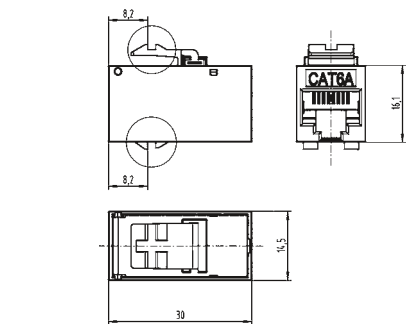
HARTING RJ Industrial® 10G
RJ45 bulkhead
(HIFF version)

09 45 545 1560



HARTING RJ Industrial® 10G
RJ45 bulkhead
(keystone version)

09 45 545 1568





HARTING RJ Industrial® cable jack (HIFF version)

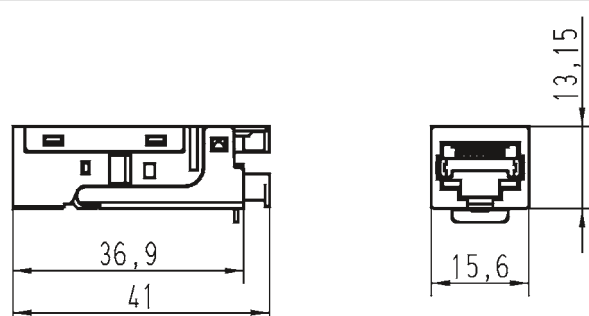
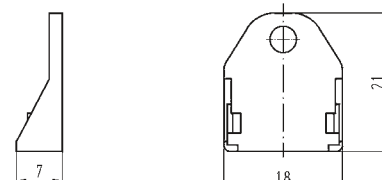


Advantages

- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Field-assembly with 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 performance	Category 6, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 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) ¹⁾ max. 1.2 mm (incl. insulation) ²⁾
- 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	Drawing	Dimensions in mm
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		

¹⁾ For part number 09 45 545 1561

²⁾ For part number 09 45 545 1562 and 09 45 545 1120



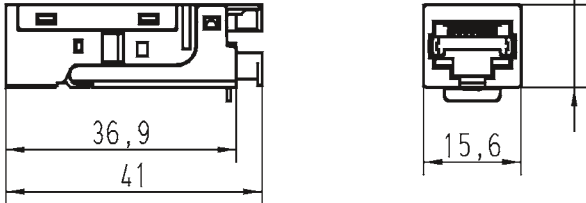
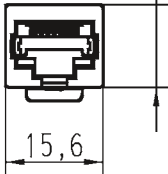
preLink® RJ45 jacks (HIFF)

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 60603-7
Number of contacts	8
Transmission performance	Category 6A, Class EA up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	preLink® 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
preLink® set RJ45 jack consists of: • 1x RJ45 module • 1x terminal module • 1x cable tie AWG 22/23 AWG 26/27	20 82 001 0001 20 82 001 0002		
preLink® RJ45 jack module	20 82 000 0002		
preLink® RJ45 terminal module AWG 22/23, yellow ¹⁾ AWG 26/27, white ¹⁾ AWG 22/23, black ¹⁾ , 4 poles AWG 22/23, black ²⁾ , 4 poles	20 82 000 0001 20 82 000 0003 20 82 000 0005 20 82 000 0005 XL		
preLink® assembly tool	20 82 000 9901		

¹⁾ Packaging with 10 pieces

²⁾ Packaging with 100 pieces



HARTING RJ Industrial® cable jack (keystone version)



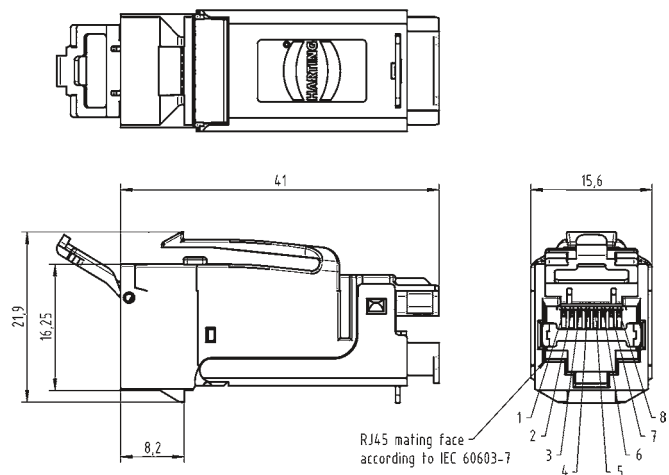
Advantages

- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6A
- Suitable for solid and stranded wires
- Field-assembly with quick termination in IDC technology
- Keystone form factor – useable 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 60603-7
Number of contacts	8
Transmission performance	Category 6A, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 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 28 ... AWG 24 (solid/stranded) ¹⁾
- Conductor diameter	AWG 24 ... AWG 22 (solid/stranded) ²⁾ max. 1.6 mm (incl. insulation) ¹⁾ max. 1.2 mm (incl. insulation) ²⁾
- 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	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 1563

²⁾ For part number 09 45 545 1564 and 09 45 545 1122



preLink® RJ45 jack
(keystone version)

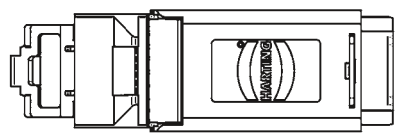
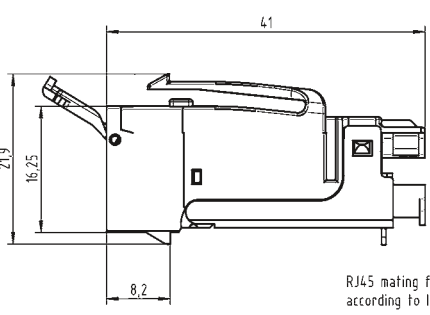
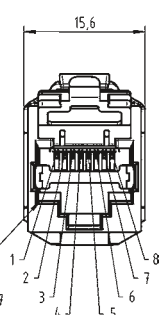


Advantages

- 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 60603-7
- 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, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	preLink® 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
preLink® set RJ45 keystone jack consists of: • 1x RJ45 module • 1x terminal module • 1x cable tie AWG 22/23	20 82 501 0001		
preLink® RJ45 keystone jack module	20 82 500 0001		
preLink® RJ45 angled keystone jack module	20 82 500 0002 ¹⁾		
preLink® RJ45 terminal module AWG 22/23, yellow ²⁾ AWG 26/27, white ²⁾ AWG 22/23, black ²⁾ , 4 poles AWG 22/23, black ³⁾ , 4 poles	20 82 000 0001 20 82 000 0003 20 82 000 0005 20 82 000 0005 XL		
preLink® assembly tool	20 82 000 9901		

¹⁾ Packaging with 24 pieces

²⁾ Packaging with 10 pieces

³⁾ Packaging with 100 pieces



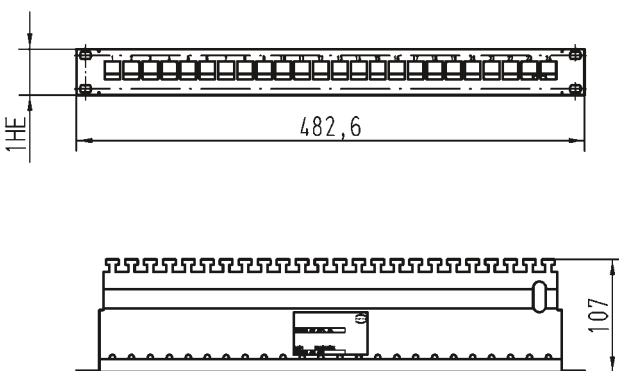
preLink®
19" patch panel, Keystone

Advantages

- Suitable for 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 11801, EN 50173-1
Data rate	up to 10 Gbit/s
Module design	Keystone size acc. to EN 60603-7:2009
Assembly	in 19" racks acc. to IEC/DIN EN 60297-3-100 (DIN 41494-1)
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
preLink® 19" patch panel, Keystone 20 82 405 0001 Range of delivery:: 24 pieces of: • preLink® RJ45 Keystone jack • terminal modules for AWG 22/23 • strain relief	20 82 405 0001		
preLink® 19" patch panel, Keystone empty	20 82 400 0002		

HARTING Cabinet Outlet RJ45, 8 poles
RJ45 distribution module for IP20 environments
(top-hat rail mounting)

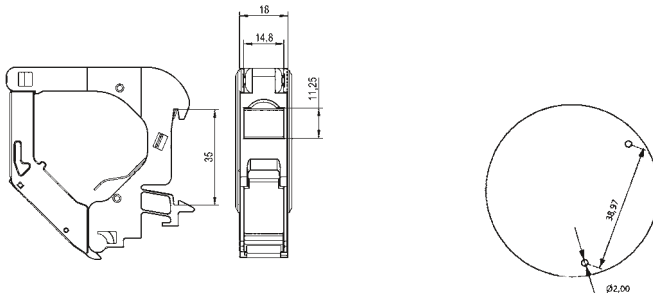
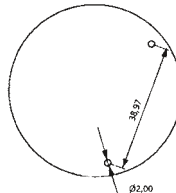


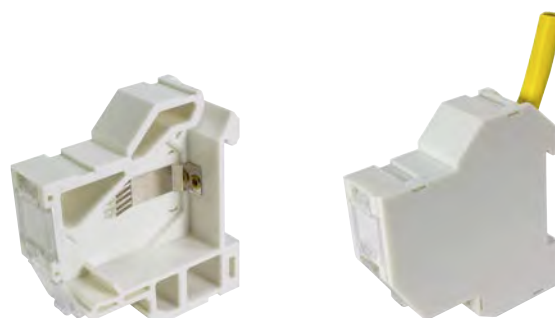
Advantages

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

Technical characteristics

Number of ports, Copper/Termination	1/RJ45 (Twisted Pair)
Transmission performance	Category 6A, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Mounting	To 35 mm top-hat mounting rail acc. to DIN EN 60715, 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			
• preLink® keystone set AWG 22/23 (with preLink® terminal block)	20 82 501 0001		
• preLink® keystone set (without preLink® terminal block)	20 82 500 0001		
Usable with preLink® terminal blocks			
• preLink® terminal block AWG 22/23 (24)	20 82 000 0001		
• preLink® terminal block AWG 26/27	20 82 000 0003		
Usable RJ45 cable jacks			
• RJ45 keystone module IDC AWG 24 – AWG 22	09 45 545 1564		
• RJ45 keystone module IDC AWG 28 – AWG 24	09 45 545 1563		



HARTING Cabinet Outlet RJ45, 8 poles
RJ45 distribution module for IP20 environments
(top-hat rail mounting)

Advantages

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

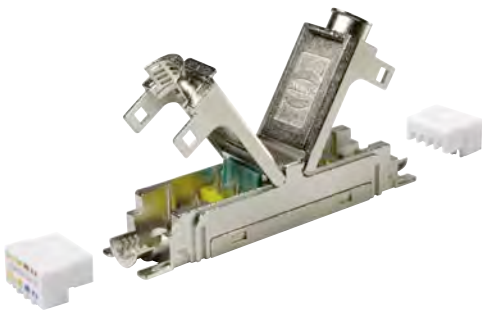
Technical characteristics

Number of ports, Copper / Termination	1 / RJ45 (Twisted Pair)
Transmission performance	Category 6A / Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Mounting	To 35 mm top-hat mounting rail acc. to DIN EN 60715, alignable
Dimensions (H x W x D)	70 x 18 x 70 mm, compatible for DIN 43880 distribution boxes
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 0002		
Lateral cover for 09 45 851 0002	09 45 851 0003		
Usable RJ45 cable jacks			
• preLink® keystone set AWG 22/23 (with preLink® terminal block)	20 82 501 0001		
• preLink® keystone set (without preLink® terminal block)	20 82 500 0001		
Usable with preLink® terminal blocks			
• AWG 22/23, yellow ¹⁾	20 82 000 0001		
• AWG 26/27, white ¹⁾	20 82 000 0003		
• AWG 22/23, black ¹⁾ , 4 poles	20 82 000 0005		
• AWG 22/23, black ²⁾ , 4 poles	20 82 000 0005 XL		
Usable RJ45 cable jacks			
• RJ45 keystone module IDC AWG 24 – AWG 22	09 45 545 1564		
• RJ45 keystone module IDC AWG 28 – AWG 24	09 45 545 1563		

¹⁾ Packaging with 10 pieces

²⁾ Packaging with 100 pieces



HARTING RJ Industrial® 10G Extender

Advantages

- Simple, fast and reliable connection of data cables
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6A
- 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 60603-7
Number of contacts	8
Transmission performance	Category 6A, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field assembly
Connectable cables	
– Conductor cross section	AWG 23 ... AWG 22 (solid and stranded)
– Conductor diameter	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® 10G Extender	09 45 545 1569		



preLink® Extender

Advantages

- Simple, fast and reliable connection of data cables
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6A
- 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 60603-7
Number of contacts	8
Transmission performance	Category 6A, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	preLink® 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
preLink® Extender	20 82 101 0001		
preLink® RJ45 terminal module			
AWG 22/23, yellow ¹⁾	20 82 000 0001		
AWG 26/27, white ¹⁾	20 82 000 0003		
AWG 22/23, black ¹⁾ , 4 poles	20 82 000 0005		
AWG 22/23, black ²⁾ , 4 poles	20 82 000 0005 XL		
preLink® assembly tool	20 82 000 9901		

¹⁾ Packaging with 10 pieces

²⁾ Packaging with 100 pieces



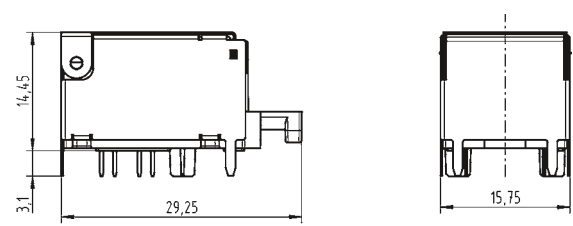
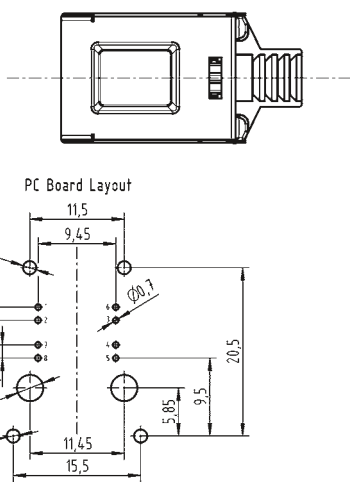
preLink® PCB jack

Advantages

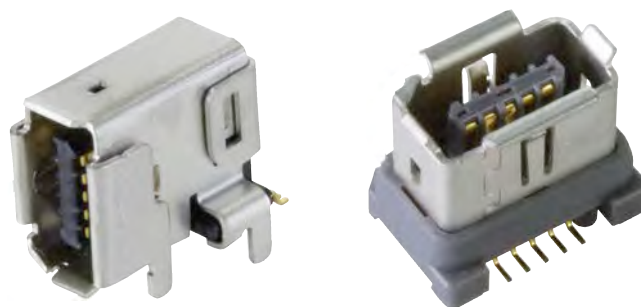
- Easy device integration
- Robust design
- 360° shielding
- Suitable for wave and reflow soldering (PSL RO and MSL 1)
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Very fast **preLink®** termination technology

Technical characteristics

Connector type	PCB jack 8 poles THR
Number of contacts	8
Shielding	fully shielded, 360° shielding contact
Mounting	preLink® IDC termination
Cable termination for preLink® terminal module, yellow, 20 82 000 0001 and black, 20 82 000 0005 resp. 20 82 000 0005 XL	
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	5.0 ... 9.5 mm
Degree of protection	IP20
Mating cycles	min. 10
Temperature range	-40 °C ... +85 °C

Identification	Part number	Drawing	Dimensions in mm
preLink® PCB jack	20 82 007 1100		
preLink® terminal module	20 82 000 0001 20 82 000 0003 20 82 000 0005 20 82 000 0005 XL	 PC Board Layout	
preLink® assembly tool	20 82 000 9901		

Further information and data sheets see www.HARTING.com¹⁾ Packaging with 10 pieces²⁾ Packaging with 100 pieces



HARTING ix Industrial® jack type A, Cat. 6A

Advantages

- Ethernet-Data jack suitable for industry
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6A
- 5000 mating cycles
- 70 % reduced size compared to RJ45

Technical characteristics

Connector type	HARTING ix Industrial® jack type A, angled acc. to IEC 61076-3-124
Number of contacts	10 (8 data + 2 GND)
Transmission performance	Category 6A / Class EA up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Rated current	1.5 A
Rated voltage	50 V
Contact resistance	≤ 30 mΩ
Insertion and withdrawal force	≤ 25 N
Test voltage $U_{r.m.s.}$	500 V
Flammability	UL 94 V-0
Degree of protection	IP20
Mating cycles	min. 5000
Temperature range	-40 °C ... +80 °C
Material insert	LCP, black

Identification

Part number

Drawing

Dimensions in mm

HARTING ix Industrial®
jack type A, angled,
angled horizontal

Delivery range:
1 piece
400 pieces on reel

09 45 281 2560 333
09 45 281 2560

HARTING ix Industrial® 10A-1
jack type A, angled,
angled vertical

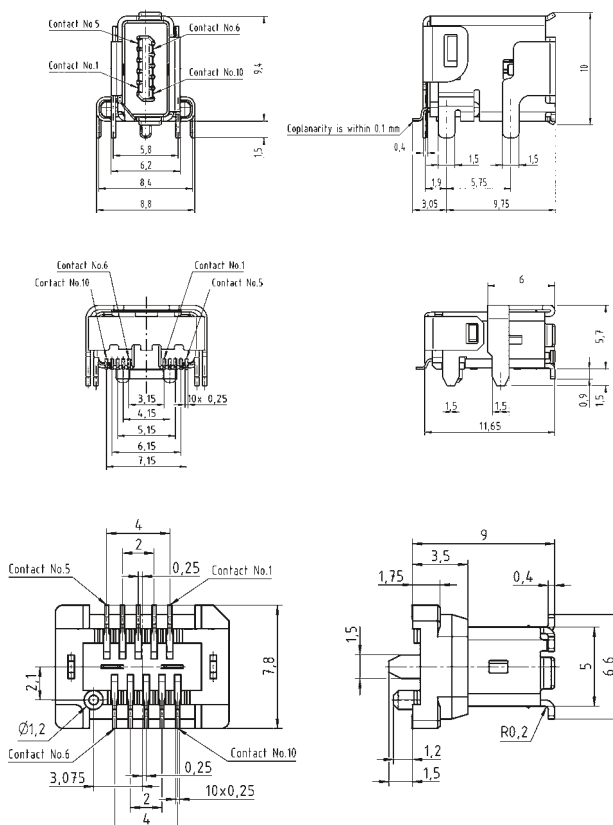
Delivery range:
1 piece
500 pieces on reel

09 45 281 2561 333
09 45 281 2561

HARTING ix Industrial® 10A-1
jack type A, straight

Delivery range:
1 piece
450 pieces on reel

09 45 281 2562 333
09 45 281 2562



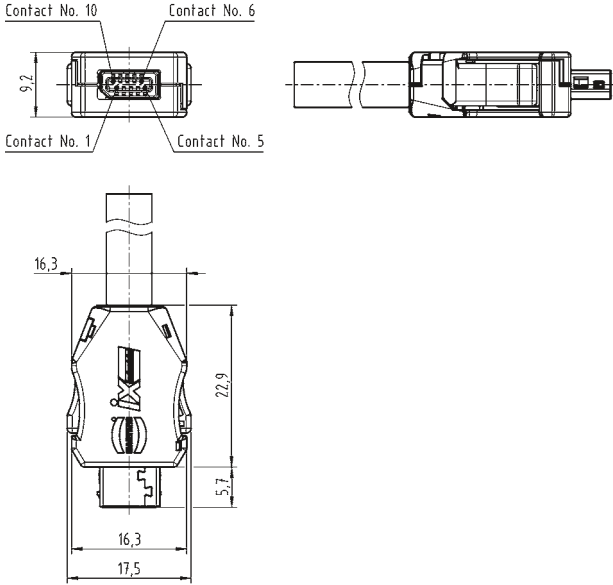


HARTING ix Industrial® connector type A, Cat. 6A

Advantages

Technical characteristics

• Ethernet-Data jack suitable for industry • Compact and robust design • 360° shielding • Category of transmission Cat. 6A • 5000 mating cycles • 70 % reduced size compared to RJ45	Connector type	HARTING ix Industrial® connector type A, angled, acc. to IEC 61076-3-124
	Number of contacts	10 (8 data + 2 GND)
	Transmission performance	Category 6A / Class EA up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
	Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
	Shielding	fully shielded, 360° shielding contact
	Rated current	1.5 A
	Rated voltage	50 V
	Contact resistance	≤ 30 mΩ
	Insertion and withdrawal force	≤ 25 N
	Test voltage $U_{r.m.s.}$	500 V
	Flammability	UL 94 V-0
	Degree of protection	IP20
	Mating cycles	min. 5000
	Temperature	-40 °C ... +85 °C
	Material	PA (isolation body), PC (housing)
	Cable diameter	5,5 ... 7,2 mm

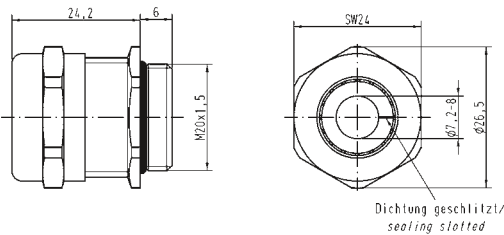
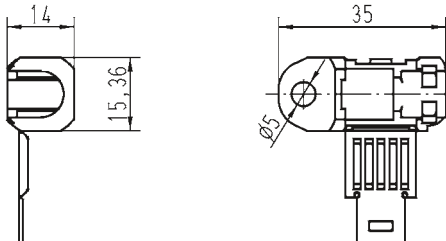
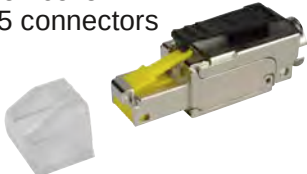
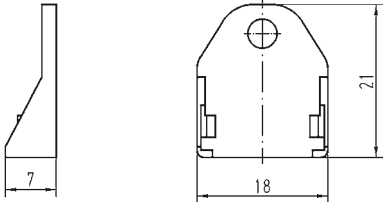
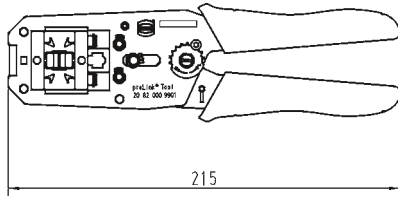
Identification	Part number	Drawing	Dimensions in mm
HARTING ix Industrial® type A connector with solder termination for AWG 28/7 - 22/7 and conductor diameters up to 1.55 mm with IDC termination for AWG 28/7 - 26/7 and conductor diameters from 0.95 - 1.05 mm with IDC termination for AWG 28/7 - 24/7 and conductor diameters von 0,95 - 1,05 mm with IDC termination AWG 28/7 - 22/7 and conductor diameters von 1,4 - 1,6 mm	 09 45 181 2560 XL ¹⁾ 09 45 181 2561 XL ¹⁾ 09 45 181 2562 XL ¹⁾ 09 45 181 2563 XL ¹⁾		

¹⁾ Packaging with 100 pieces



Identification	Part number	Drawing	Dimensions in mm
HARTING ix Industrial® connector type A angled bottom entry with solder termination for AWG 28/7 - 22/7 and conductor diameter of max. 1.55 mm with IDC termination for AWG 28/7 - 26/7 and conductor diameter of 1.1 - 1.25 mm with IDC termination for AWG 28/7 - 24/7 and conductor diameter of 0.95 - 1.05 mm with IDC termination for AWG 28/7 - 22/7 and conductor diameter of 1.4 - 1.6 mm	 09 45 181 2580 XL ¹⁾ 09 45 181 2581 XL ¹⁾ 09 45 181 2582 XL ¹⁾ 09 45 181 2583 XL ¹⁾		
HARTING ix Industrial® connector type A angled top entry with solder termination for AWG 28/7 - 22/7 and conductor diameter of max. 1.55 mm with IDC termination for AWG 28/7 - 26/7 and conductor diameter of 1.1 - 1.25 mm with IDC termination for AWG 28/7 - 24/7 and conductor diameter of 0.95 - 1.05 mm with IDC termination for AWG 28/7 - 22/7 and conductor diameter of 1.4 - 1.6 mm	 09 45 181 2585 XL ¹⁾ 09 45 181 2586 XL ¹⁾ 09 45 181 2587 XL ¹⁾ 09 45 181 2588 XL ¹⁾		

¹⁾ Packaging with 100 pieces

Identification	Part number	Drawing	Dimensions in mm
Cable gland M20x1.5 for pre-terminated preLink® cable assemblies with slotted seal Cable-sheath 7.2 mm ... 8.0 mm Cable-sheath 4.0 mm ... 6.5 mm 	19 00 000 5020 19 00 000 5079		
Protection cover for pre-terminated preLink® cable assemblies Set of 10 pieces 	20 82 000 9915		
Protection cover for RJ45 connectors 	09 45 852 0000		
Protection cover for RJ45 jacks 	09 45 852 0001		
Unlocking tool for preLink® RJ45 module Set of 5 pieces 	20 82 000 9916		
HARTING Assembly tool for preLink® terminal module 	20 82 000 9901		

Identification	Part number	
HARTING RJ Industrial® Stripping Tool Stripping tool for Ethernet cables including blade cassette Spare blade cassette	09 45 800 0000 09 45 800 0001	 The RJ Industrial Stripping Tool is ready to remove insulation from Ethernet 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 M12 dynamometric screwdriver SW 18 or 13	09 99 000 0382	
Crimping tool for M12 Crimp	09 99 000 0501	
Cable shear	09 45 800 0004	
Wire cutter	09 45 800 0005	
HARTING RJ Industrial® Gigalink assembly tool	09 45 800 0520	



Han® PushPull, type acc. to IEC 61076-3-117 variant 14 RJ45 connector

Advantages

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

Technical characteristics

Locking	PushPull technology acc. to IEC 61076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60603-7
Shielding	Fully shielded, 360° shielding contact
Number of contacts	4 respectively 8
Transmission performance	acc. to ISO/IEC 11801, EN 50173-1, Category 5, Class D up to 100 MHz, Category 6, Class E _A up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s
Termination for Cat. 5	with IDC contacts, no tools needed/field-assembly
Conductor cross section	AWG 24/7 - 22/7 (stranded) AWG 23/1 - 22/1 (solid)
Cable diameter	1.6 mm
Conductor cross section for Cat. 6	AWG 22/7 - 27/7 (stranded) 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 incl. housing and male insert Han® RJ Industrial Category 5, 4 poles, IDC contacts 6.5 - 9.5 mm clamp range 5 - 8 mm clamp range	09 35 221 0421 09 35 222 0421		
Han® RJ Industrial PN Category 5, 4 poles, IDC contacts 6.5 - 9.5 mm clamp range PROFINET-Identification: PROFINET O-Plug RJ45	09 35 226 0421		
Han® RJ Industrial 10G Category 6, 8 poles, IDC contacts 6.5 - 9.5 mm clamp range 5 - 8 mm clamp range	09 35 225 0421 09 35 228 0421		



Han® PushPull, type acc. to IEC 61076-3-117 variant 14 RJ45 connector

Advantages

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

Technical characteristics

Locking	PushPull technology acc. to IEC 61076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60603-7
Shielding	Fully shielded, 360° shielding contact
Number of contacts	4 respectively 8
Transmission performance	acc. to ISO/IEC 11801, EN 50173-1, Category 5, Class D up to 100 MHz Category 6, Class E _A up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s
Termination	with IDC contacts, no tools needed / field-assembly
for Cat. 5	
Conductor cross section	AWG 24/7 - 22/7 (stranded) AWG 23/1 - 22/1 (solid)
Cable diameter	1.6 mm
for Cat. 6	
Conductor cross section	AWG 22/7 - 27/7 (stranded) 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 incl. housing and male insert Han® RJ Industrial Category 5, 4 poles, IDC contacts 6.5 - 9.5 mm clamp range	09 35 221 0401		
Han® RJ Industrial PN Category 5, 4 poles, IDC contacts 5 - 8 mm clamp range	09 35 222 0401		
Han® RJ Industrial PN Category 5, 4 poles, IDC contacts PROFINET-Identification: PROFINET O-Plug RJ45 6.5 - 9.5 mm clamp range	09 35 226 0401		
Han® RJ Industrial 10G Category 6, 8 poles, IDC contacts 4 - 11 mm clamp range	09 35 225 0401		



Han® PushPull, type acc. to IEC 61076-3-117 variant 14
RJ45 connector angled

Advantages

- 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 61076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60603-7
Shielding	Fully shielded, 360° shielding contact
Number of contacts	4 respectively 8
Transmission performance	acc. to ISO/IEC 11801, EN 50173-1, Category 5, Class D up to 100 MHz Category 6, Class E _A up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s
Termination	with IDC contacts, no tools needed / field-assembly
for Cat. 5	
Conductor cross section	AWG 24/7 - 22/7 (stranded) AWG 23/1 - 22/1 (solid)
Cable diameter	1.6 mm
for Cat. 6	
Conductor cross section	AWG 22/7 - 27/7 (stranded) 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 incl. housing and male insert Han® RJ Industrial PN Category 5, 4 poles, IDC contacts, 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 Category 6, 8 poles, IDC contacts, 6.5 - 9.5 mm clamp range			
Cable exit bottom side	09 35 225 0402		
Cable exit top side	09 35 225 0403		



Han® PushPull, type acc. to IEC 61076-3-117 variant 14
RJ45 connector

Advantages

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

Technical characteristics

Locking	PushPull technology
Degree of protection	acc. to IEC 61076-3-117
Mating face	IP65 / IP67
Shielding	RJ45 acc. to IEC 60603-7
Number of contacts	Fully shielded, 360° shielding contact
Transmission performance	8
	acc. to ISO/IEC 11801,
	EN 50173-1, Category 6A, Class EA
	up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s,
	2,5 Gbit/s, 5 Gbit/s, 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
	Plastic, black, UL 94 V0

Identification	Part number	Drawing	Dimensions in mm
Connector set, metal incl. housing and male insert 4 - 11 mm clamp range Han® RJ Industrial Category 6, 8 poles, piercing contacts	09 35 227 0401		
Connector set, plastic incl. housing and male insert 5 - 8 mm clamp range Han® RJ Industrial Category 6A, 8 poles, piercing contacts	09 35 227 0421		
suitable assembly tool	09 45 800 0520	Gesamtlänge montiert ca. 69/ complete length assembled acc. to 69	



Han® PushPull, type acc. to IEC 61076-3-117 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. 6A
- 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 61076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60603-7
Number of contacts	8
Transmission performance	Category 6A, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	preLink® 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		
Han® PushPull preLink® RJ45 connector plastic, straight	20 82 204 0001		
preLink® RJ45 terminal module			
AWG 22/23, yellow ¹⁾	20 82 000 0001		
AWG 26/27, white ¹⁾	20 82 000 0003		
AWG 22/23, black ¹⁾ , 4 poles	20 82 000 0005		
AWG 22/23, black ²⁾ , 4 poles	20 82 000 0005 XL		
preLink® assembly tool	20 82 000 9901		

Further information and data sheets see www.HARTING.com

¹⁾ Packaging with 10 pieces

²⁾ Packaging with 100 pieces



Han® PushPull, type acc. to IEC 61076-3-117 variant 14
RJ45 10G panel feed through

Advantages

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

Technical characteristics

Locking	PushPull technology acc. to IEC 61076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60603-7
Transmission performance	acc. to ISO/IEC 11801, EN 50173-1, Category 5, Class D up to 100 MHz resp. Category 6, Class E _A up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 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 Zinc die-cast, nickel-plated
Flammability acc. to UL 94	V0

Identification

Part number

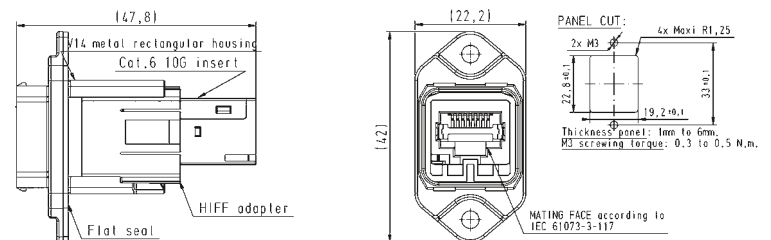
Drawing

Dimensions in mm

Han® PushPull RJ45 10G

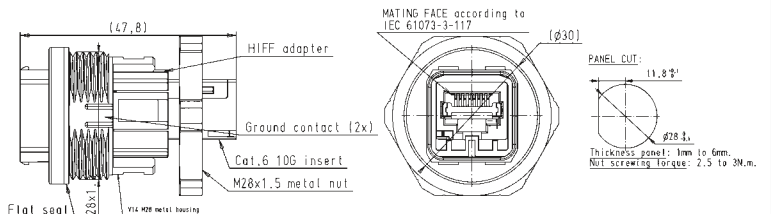
Panel feed through, Cat. 6 including bulkhead housing for rectangular panel cut out, flat seal and HARTING RJ Industrial® 10G RJ45 bulkhead, isolated bulkhead fixture

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

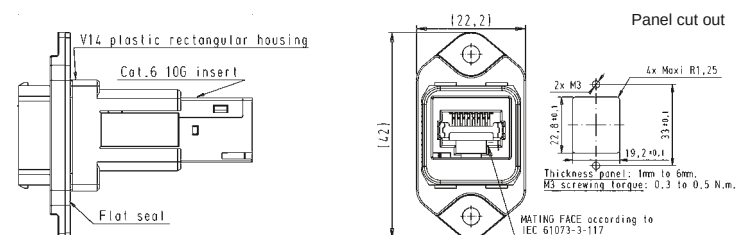
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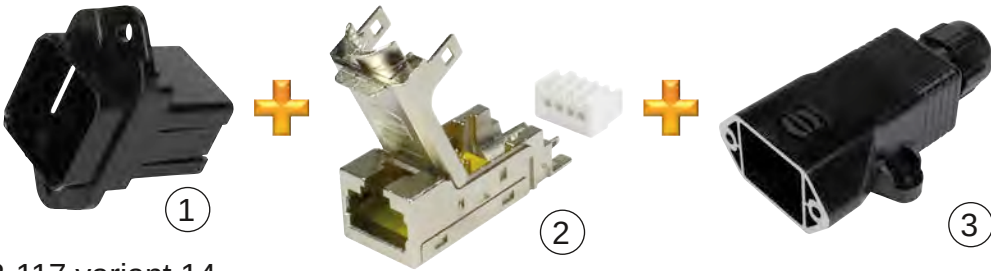


Han® PushPull RJ45

Panel feed through Cat. 6 including housing and HARTING RJ Industrial® 10G RJ45 bulkhead

09 35 225 0331

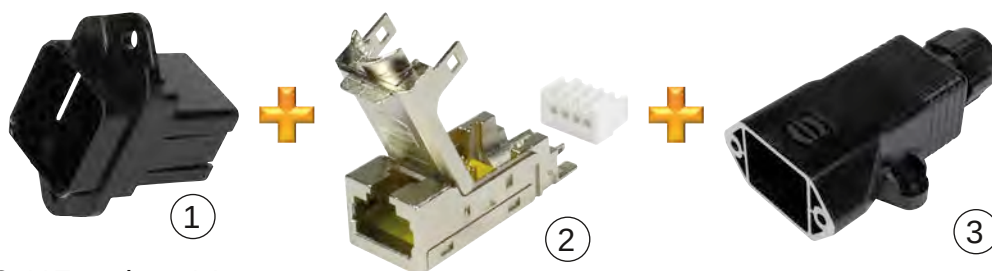




Han® PushPull,
type acc. to IEC 61076-3-117 variant 14
Housing bulkhead mounting and housing cable-to-cable combinations

Advantages		Technical characteristics	
• Type / Material	RJ45 / plastic or metal	Connector type	PushPull technology acc. to IEC 61076-3-117 variant 14
• Category	Cat. 5 / Cat. 6A	Number of contacts	4 or 8 depending on type
• Number of wires	4 / 8	Transmission performance	Category 5 / 6A depending on type
• Termination	IDC	Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
• Cable diameter	5 - 9 mm	Shielding	fully shielded, 360° shielding contact
Application		Cable termination	tool-less with IDC contacts or preLink® IDC
• Industrial cabling		Degree of protection	IP65 / IP67
• On machines and control units		Temperature range	-40 °C ... +70 °C
Benefits		Housing material	plastic / metal
• HARTING PushPull technology			
• Compact design			
• High packing density			
• Device integration via RJ45 PCB connectors			

Identification	Part number	Drawing	Dimensions in mm
Han® PushPull V14 Housing bulkhead mounting			
panel feed-through plastic, black	09 35 012 0331		
panel feed-through metal for angular panel cut out, incl. plastic mounted adapter	09 35 012 0311		
panel feed-through metal for round panel cut out, incl. plastic mounted adapter and fixing nut (Not combinable with ③ !)	09 35 012 0312		



Han® PushPull,
type acc. to IEC 61076-3-117 variant 14
Housing bulkhead mounting and housing cable-to-cable combinations

Identification	Part number	Drawing	Dimensions in mm
RJ45 female inserts (2) Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 28-24 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 27/26 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003)	09 45 545 1120 09 45 545 1561 09 45 545 1562 20 82 001 0001 20 82 001 0002 20 82 000 0002		
Han® PushPull Housing cable-to-cable (3) plastic, black (not in combination with Housing bulkhead mounting 09 35 012 0312!) for cable outer diameter 6.5 ... 9.5 mm for cable outer diameter 9 ... 13 mm	09 35 002 0431 09 35 002 0433		

Number of contacts

4



Features

- HARTING PushPull (V14) technology
- 360° shielding
- Field assembly
- No side cutter needed anymore – integrated cutting blades behind the IDC contacts cut the wires to the correct length
- Wide range IDC for solid and stranded wires from AWG 26 to AWG 22
- Suitable for all PoE versions

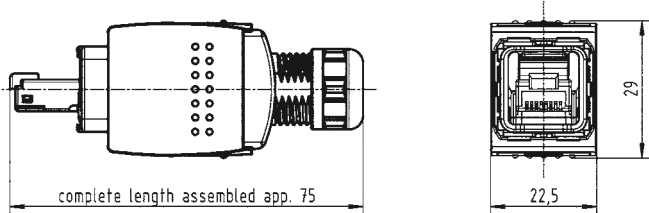
Technical characteristics

Number of contacts	4
Transmission characteristics	Cat. 5, Class D up to 100 MHz
Data rate	10 Mbit/s, 100 Mbit/s
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 750
Conductor cross-section	0.12 ... 0.32 mm ² Stranded 0.12 ... 0.32 mm ² Solid
Conductor cross-section	AWG 26/7 ... AWG 22/7 Stranded AWG 24/1 ... AWG 22/1 Solid
Wire outer diameter	0.8 ... 1.6 mm
Degree of protection acc. to IEC 60529	IP65 / IP67
Cable diameter	5 ... 8 mm
Material (hood/housing)	Zinc die-cast
Surface (hood/housing)	Nickel plated

Specifications and approvals

IEC 60603-7 Mating face
IEC 11801
EN 50173-1
IEC 61076-3-117 Variant 14
DNV GL



Identification	Part number	Drawing	(dimensions in mm)
Han® PushPull (V14), Connector, AIDA compliant, PROFINET, Straight, IDC termination, Fully shielded, 360° shielding contact 	09 35 229 0401		
When installing a PROFINET system, observe the PROFINET installation guideline.			

Number of contacts

8



Features

- HARTING PushPull (V14) technology
- 360° shielding
- Category of transmission Cat. 6_A
- Field assembly
- No side cutter needed anymore – integrated cutting blades behind the IDC contacts cut the wires to the correct length
- Wide range IDC for solid and stranded wires from AWG 26 to AWG 22
- Suitable for all PoE versions

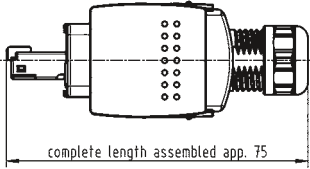
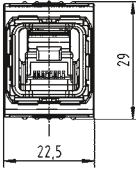
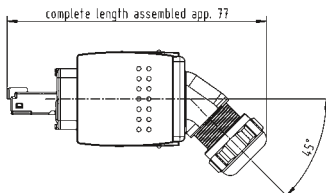
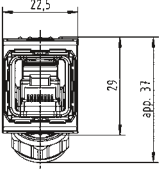
Technical characteristics

Number of contacts	8
Transmission characteristics	Cat. 6 _A , Class E _A up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2.5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 750
Conductor cross-section	0.12 ... 0.32 mm ² Stranded 0.12 ... 0.32 mm ² Solid
Conductor cross-section	AWG 26/7 ... AWG 22/7 Stranded AWG 24/1 ... AWG 22/1 Solid
Wire outer diameter	0.8 ... 1.6 mm
Degree of protection acc. to IEC 60529	IP65 / IP67
Cable diameter	6.5 ... 9.5 mm
Material (hood/housing)	Zinc die-cast
Surface (hood/housing)	Nickel plated

Specifications and approvals

IEC 60603-7 Mating face
IEC 11801
EN 50173-1
IEC 61076-3-117 Variant 14
DNV GL



Identification	Part number	Drawing	(dimensions in mm)
Han® PushPull (V14), Connector, AIDA compliant, PROFINET, Straight, IDC termination, Fully shielded, 360° shielding contact 	09 35 220 0401		
Han® PushPull (V14), Connector, AIDA compliant, PROFINET, angled bottom, IDC termination, Fully shielded, 360° shielding contact 	09 35 220 0402		



Han® PushPull RJ45 Gender changer Metal
Cat. 6, Class E_A



Advantages

- 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 11801 Chapter 10.2.4

Technical characteristics

Transmission performance	Cat. 6, Class E _A up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Connector	Han® PushPull RJ45 (PROFINET conform)
Locking	PushPull technology acc. to IEC 61076-3-117 variant 14
Mating face	RJ45 acc. to IEC 60603-7
Mating cycles	min. 750
Housing material	Aluminium anodized
Dimensions	61.2 x 62 x 25.2 mm (unmated)
Degree of protection acc. to DIN 60529	IP65 / IP67 (mated)
Mounting	Wall mountable with 4 screws (type M5)
Temperature range	-40 °C ... +70 °C
Maximum permissible humidity	30 % ... 95 % (no condensation)

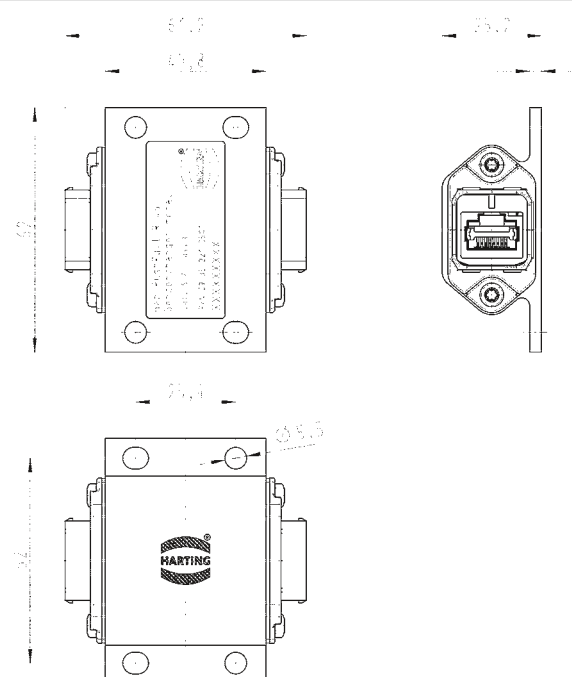
Identification

Han® PushPull RJ45
Gender changer metal

Part number

09 35 221 0501

Drawing



Dimensions in mm



Han® PushPull RJ45 Coupling Metal
Cat. 6, Class E_A

Advantages

- 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 up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Locking	PushPull technology acc. to IEC 61076-3-117 variant 14
Mating face	RJ45 acc. to IEC 60603-7
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 60529	IP65 / IP67
Temperature range	-40 °C ... +70 °C

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



Han® PushPull Metal Outlet acc. to IEC 61076-3-117 variant 14
Cat. 6_A, 8 poles

Advantages	Technical characteristics	
- 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	Number of ports, Copper / Termination	2 x Han® PushPull (V14) RJ45 (IP65 / IP67) or Han® 3 A RJ45
	Transmission performance	Category 6, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
	Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
	Termination	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
preLink® Han® PushPull Metal Outlet consists of: 1x Housing including protection covers 2x preLink® Set RJ45 jack AWG 22/23 2x Cable gland with slotted seal 1x Assembly instruction	20 82 104 0101		

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

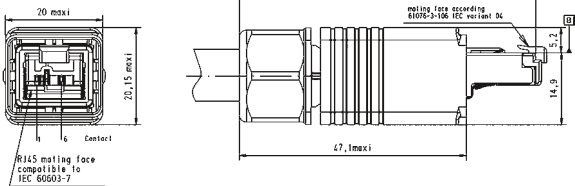
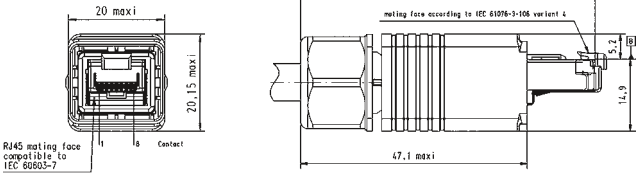
Identification	Part number	
Han® PushPull protection cover IP65 / IP67 for device side without fixing cord with fixing cord with nylon fixing cord	 09 35 002 5403 XL ¹⁾ 09 35 002 5402 09 35 002 5402 XL ¹⁾ 09 35 002 5404 09 35 002 5404 XL ²⁾	
Han® PushPull protection cover IP65 / IP67 for cable side without fixing cord with nylon fixing cord	 09 35 002 5411 09 35 002 5413	

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



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

Advantages		Technical characteristics	
• 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)		Locking	PushPull Technology 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 (metal version) 4.5 ... 10 mm (plastic version)
		Termination cross section	
		Cat. 5	AWG 24/7 ... AWG 22/7 (stranded) 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 Zinc die-cast, shining
		Flammability acc. to UL 94	V0
			UL approval (E102079)

Identification	Part number	Drawing		Dimensions in mm
Connector, 4 poles Cat. 5 incl. housing with RJ45 connector, shielding and cable gland	09 45 145 1106 09 45 195 1100 (metal version)			
Connector, 8 poles Cat. 6 _A incl. housing with RJ45 connector, shielding and cable gland	09 45 145 1521 09 45 145 1521 XL ¹⁾ 09 45 195 1520 (metal version)			
suitable assembly tool	09 45 800 0520			

1) Packaging with 100 sets



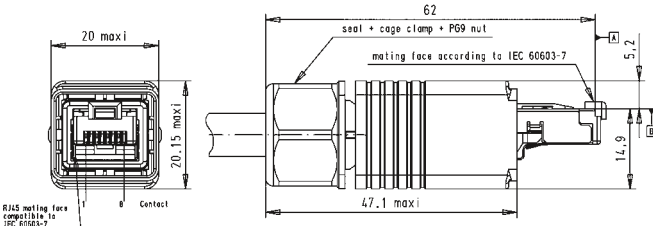
HARTING PushPull acc. to IEC 61076-3-106 variant 4
RJ45 connector

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 acc. to IEC 61076-3-106 variant 4
Mating face	RJ45 acc. to IEC 60603-7
Cable diameter	4.9 ... 8.6 mm (metal version) 4.5 ... 10 mm (plastic version)
Termination cross section	AWG 27/7 ... AWG 22/7 (stranded) 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 Zinc die-cast, shining
Flammability acc. to UL 94	V0
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
Connector, 8 poles Cat. 6 incl. housing with RJ45 connector, shielding and cable gland	09 45 145 1561 09 45 195 1560 (metal version)		
Colour clips for colour coding the HARTING PushPull connectors	Blue 09 45 840 0008 Violet 09 45 840 0007 Green 09 45 840 0006 Red 09 45 840 0005 Yellow 09 45 840 0004		



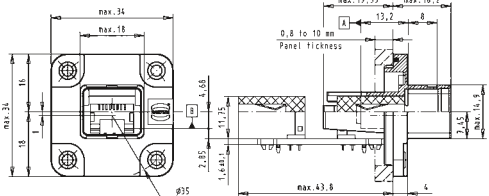
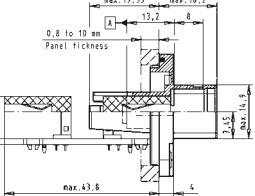
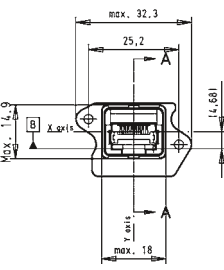
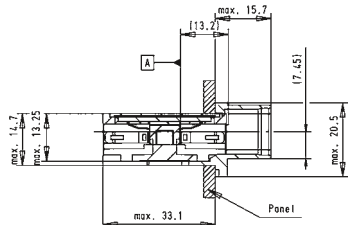
HARTING PushPull acc. to IEC 61076-3-106 variant 4
RJ45 panel feed-throughs

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
Data rate Cat. 5 versions	10 Mbit/s, 100 Mbit/s, 1000 Mbit/s
Data rate Cat. 6 versions	10 Mbit/s, 100 Mbit/s 1 Gbit/s, 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 Zinc die-cast, shining
Flammability acc. to UL 94	V0
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
Panel feed-through set category of transmission Cat. 5 incl. housing bulkhead mounting EasyInstall metal with integrated seal, 2 x RJ45-jack board drillings for M3	09 45 295 1130		
Panel feed-through set category of transmission Cat. 6 incl. housing bulkhead mounting Compact, with integrated seal, 2 x RJ45-jack	09 45 245 1561		



HARTING PushPull acc. to IEC 61076-3-106 variant 4
RJ45 – bulkhead

Advantages

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

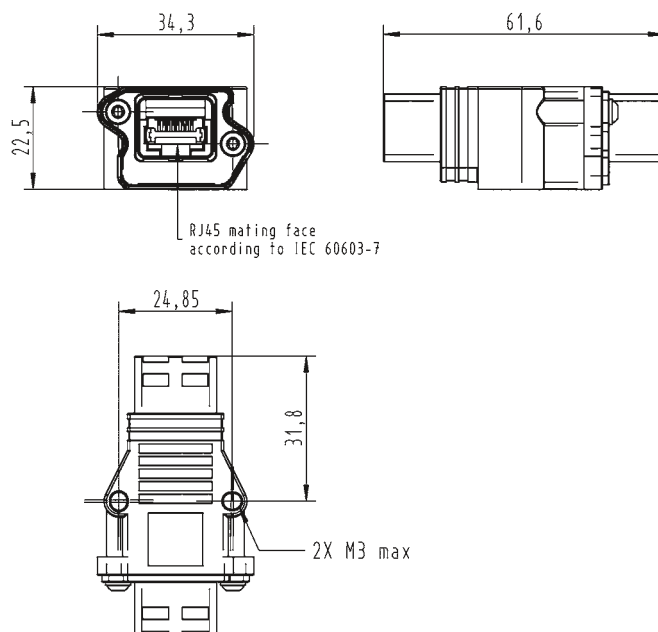
Technical characteristics

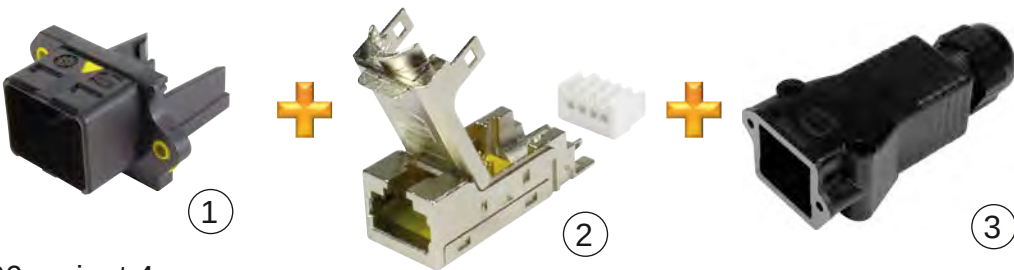
Locking	PushPull Technology acc. to IEC 61076-3-106 variant 4
Number of contacts	8
Transmission category	Cat. 6, performance class E _A , suitable for 1/10 Gigabit Ethernet
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mating cycles	min. 750
Degree of protection	IP65 / IP67
Temperature range	-40 °C ... +70 °C
Housing material	Plastic, black
Flammability acc. to UL 94	V0
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
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HARTING PushPull RJ45 –
bulkhead

09 45 345 1560





HARTING PushPull
acc. to IEC 61076-3-106 variant 4
Housing bulkhead mounting and housing cable-to-cable combinations

Advantages		Technical characteristics	
• Type / Material	RJ45 plastic	Connector type	HARTING PushPull (V4) RJ45 connector acc. to IEC 61076-3-106 variant 4
• Category	Cat. 5 / Cat. 6A	Number of contacts	4 or 8 depending on type
• Number of wires	4 / 8	Transmission performance	Category 5 / 6A depending on type
• Termination	IDC	Data rate	10 Mbit/s, 100 Mbit/s 1 Gbit/s, 10 Gbit/s depending on type
• Outer diameter	5 - 9 mm	Shielding	fully shielded, 360° shielding contact
Application		Cable termination	tool-less with IDC contacts or preLink® IDC
• Industrial cabling		Degree of protection	IP65 / IP67
• On machines and control units		Temperature range	-40 °C ... +70 °C
• Outdoor		Housing material	polycarbonate, UL 94 V0, black
Benefits			
• HARTING PushPull technology			
• Compact design			
• High packing density			
• Device integration via RJ45 PCB connectors			

Identification	Part number	Drawing	Dimensions in mm
HARTING PushPull V4 Housing bulkhead mounting Housing bulkhead mounting – Compact with integrated seal, mounting drills for M2.5 plastic, black	09 45 545 0041		



HARTING PushPull,
type acc. to IEC 61076-3-106 variant 4
Housing bulkhead mounting and housing cable-to-cable combinations

Identification	Part number	Drawing	Dimensions in mm
RJ45 female inserts ② Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 28-24 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 27/26 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003)	09 45 545 1120 09 45 545 1561 09 45 545 1562 20 82 001 0001 20 82 001 0002 20 82 000 0002		
HARTING PushPull Housing cable-to-cable ③ plastic, black for cable outer diameter 6.5 ... 9.5 mm HARTING PushPull Housing bulkhead mounting extern, plastic, black (Not combinable with EasyInstall Housing bulkhead mounting 09 45 545 0032!)	09 45 345 0000 09 45 345 0001		



Identification	Part number	Drawing	Dimensions in mm
Transport protection for device side IP40	09 45 845 0003		
Protection cover for device side IP65 / IP67			
Version with passive locking without cord	09 45 845 0009 024		
Version with passive locking with plastic cord for fixing screw M3	09 45 845 0009		
Version with passive locking with nylon cord for fixing screw M2.5/M3	09 45 845 0011 024		
Version with active locking without cord	09 45 845 0015		
Version with active locking with plastic cord for fixing screw M3	09 45 845 0014		
Version with active locking with nylon cord for fixing screw M2.5/M3	09 45 845 0013		
Protection cover for connectors IP65 / IP67	09 45 845 0010		
Blinding plate to close PushPull Compact panel cuttings	09 45 845 0019		



Technical characteristics

Limiting temperature	-20 ... +70 °C
Degree of protection acc. to IEC 60529	IP65 / IP67
Cable diameter	6 ... 9 mm
Fixing	Wall mounting

Technical characteristics

Material (hood/housing)	Polycarbonate (PC) Fibre-glass reinforced
Colour (hood/housing)	Black
Material flammability class acc.to UL 94	V-0

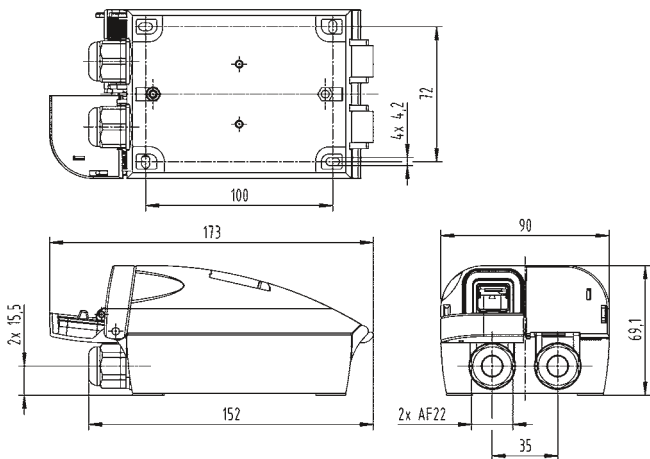
Identification	Part number	Drawing	Dimensions in mm
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HARTING PushPull (V4),
Outlet,
Empty,
for fixture of 2x RJ45 female inserts,
Black



Please order insert separately.

09 45 845 1560





Ethernet ports copper
2x HARTING PushPull (V4) RJ45 (IP65 / IP67)

Features

- Simple mounting
- Cable entering optionally from bottom or from topside
- Self-closing protection caps in IP65 / IP67
- IP65 / IP67 Label
- Compatible with RJ45 female inserts (HIFF-version)

Technical characteristics

Transmission characteristics	Cat. 6A, Class EA up to 500 MHz
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 10 Gbit/s
Limiting temperature	-20 ... +70 °C
Conductor cross-section	0.22 ... 0.32 mm ² Solid 0.22 ... 0.32 mm ² Stranded
Conductor cross-section	AWG 24 ... AWG 22
Wire outer diameter	1.7 mm
Degree of protection acc. to IEC 60529	IP65 / IP67
Cable diameter	6 ... 9 mm
Fixing Wall	mounting
Material (hood/housing)	Polycarbonate (PC) Fibre-glass reinforced
Colour (hood/housing)	Black White
Material flammability class acc. to UL 94	V-0

Identification

Part number

Drawing

Dimensions in mm

HARTING PushPull (V4),

IDC termination,
Fully shielded, 360° shielding contact,
Outlet,
Black,

Pack contents:

2-port outlet housing with protection caps,
Cable management,
Cable gland,
Label,
2x RJ45 jack,
Dummy plugs,
Assembly instructions



09 45 845 1562

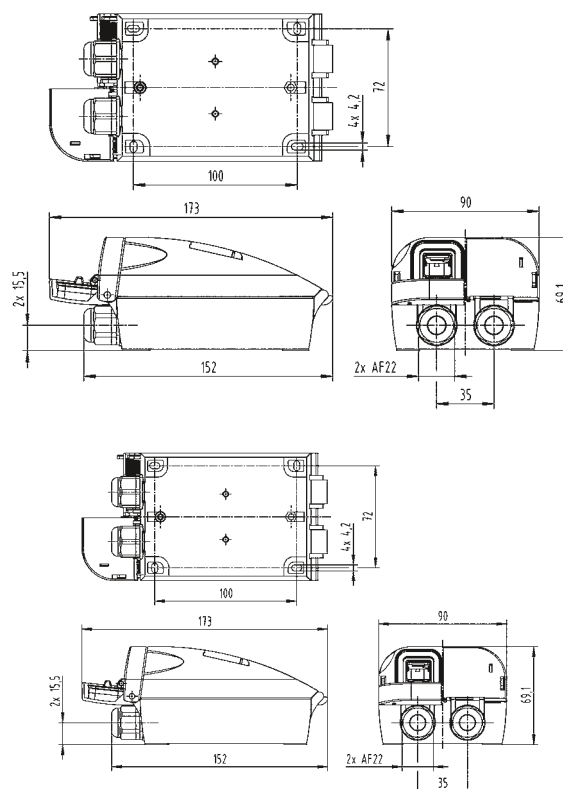
HARTING PushPull (V4),

IDC termination,
Fully shielded, 360° shielding contact,
Outlet,
White,

Pack contents:

2-port outlet housing with protection caps,
Cable management,
Cable gland,
Label,
2x RJ45 jack,
Dummy plugs,
Assembly instructions

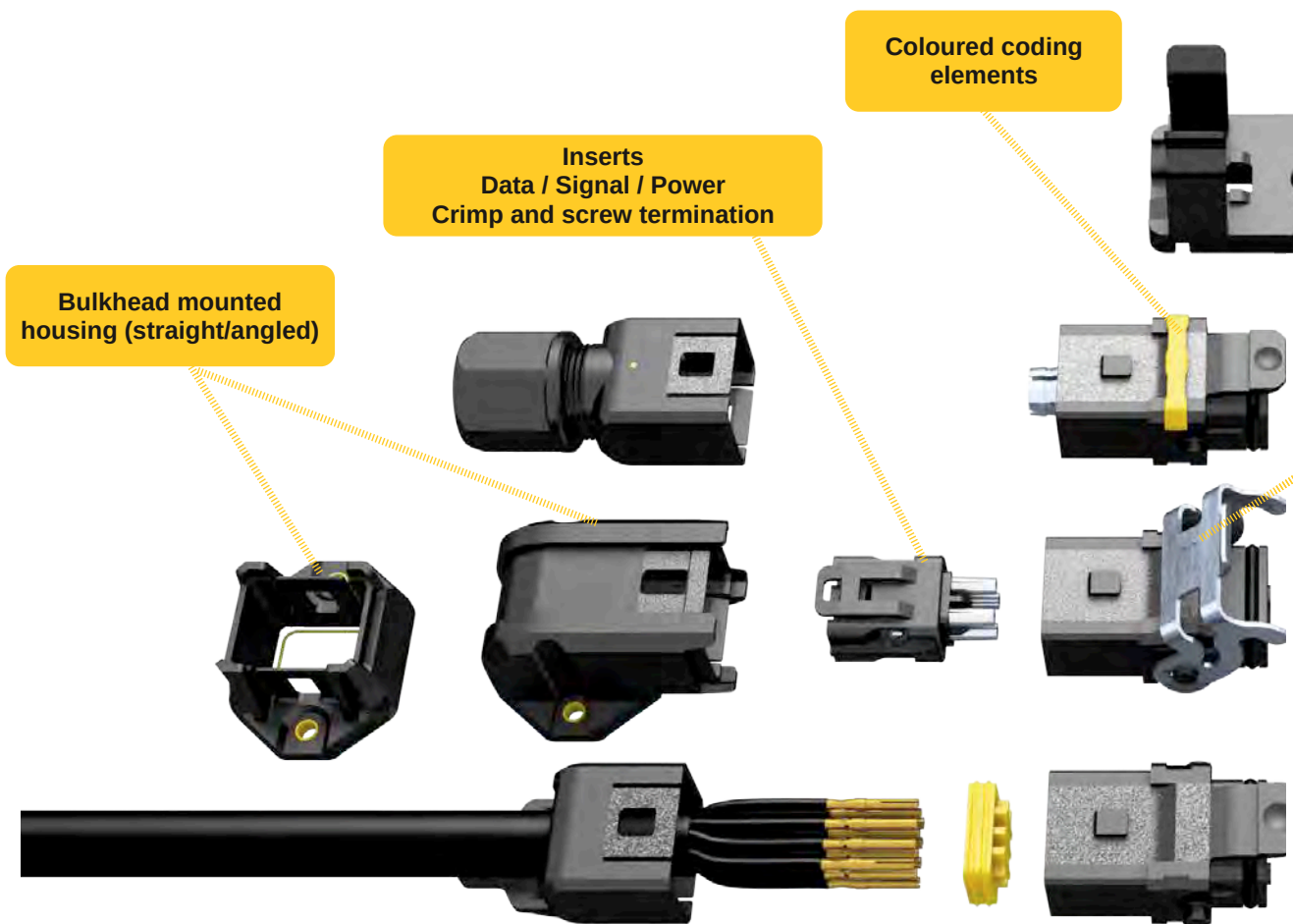
09 45 845 1563



Description of the Han® 1A System

Your configuration:

The right connectivity solution for every application!



Light weight

Thanks to the used material the Han® 1A has a weight advantage in comparison to connectors that are e.g. made of metal.



Shock and vibration resistant

The Han® 1A product series provides a high reliable connection even under shock and vibration conditions.



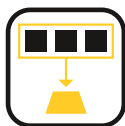
Versatile concept

Build your own connectivity solution by using the modularity advantage of the Han® 1A with inserts covering power, signal and data transmission. Together with all accessory parts the Han® 1A is a very flexible system usable for a broad range of applications.



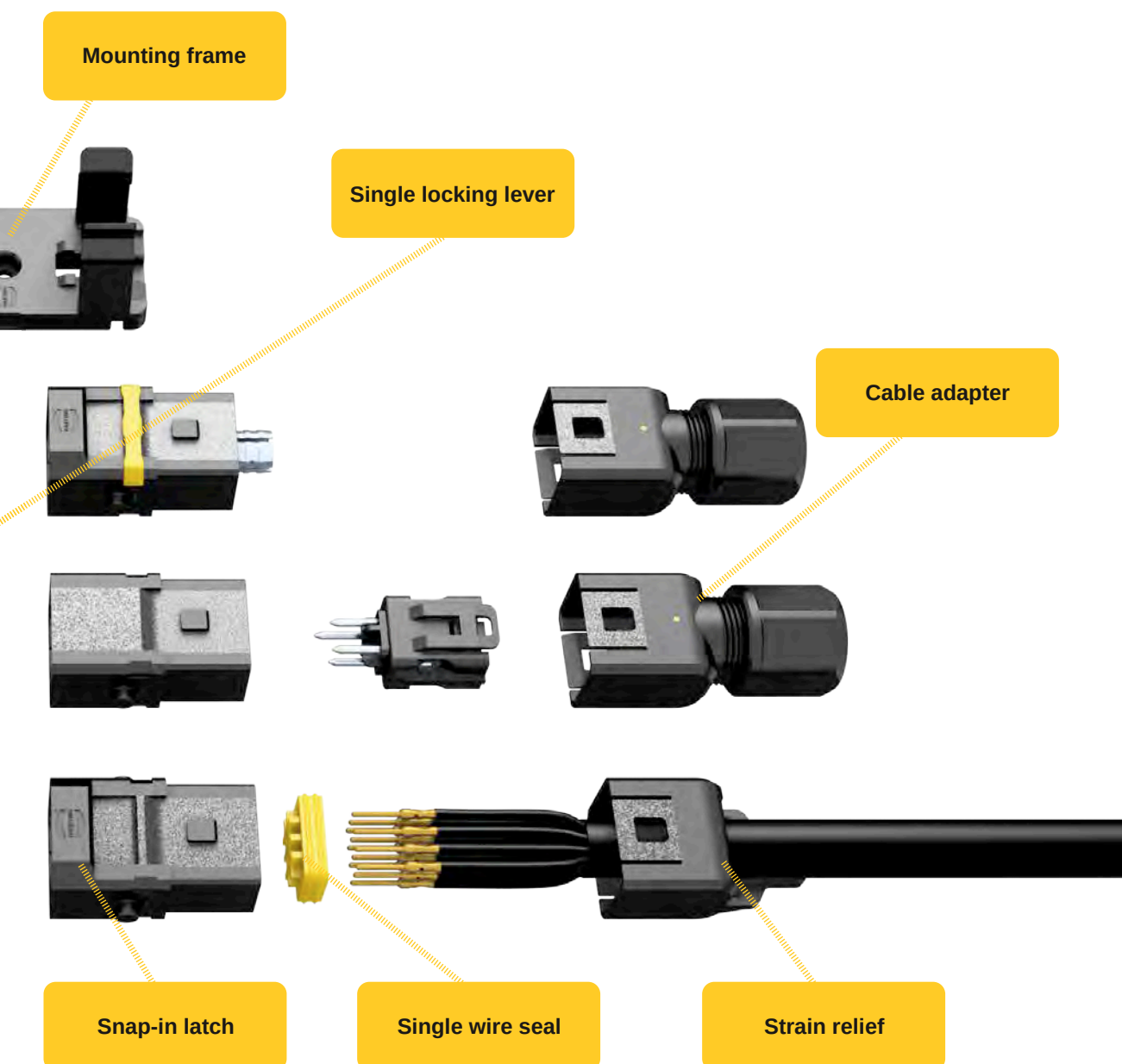
Time saving

Due to the easy mate and click design of all single components the assembly of the connector is done within seconds – and there are no tools needed.



Space saving

The Han® 1A components are designed to fulfil the trend of miniaturisation – while being still a robust Han® connector also for harsh environments.



Chemical resistance

Although the Han® 1A is made of plastic, the connector is resistant to chemicals and other aggressive influences.



Cost saving

Limited storage costs due to a versatile system – almost unlimited combinations possible.



Data transmission up to Cat. 6A

The modularity of the new connector offers a complete system which also includes the possibility of highspeed data transmission.



IIP protected where needed

By usage of hood and housing elements or single wire seals IP65 protection degree can be realised in an easy way.

Technical characteristics

Material characteristics

Material (insert, hood, housing)	Polyamide, TPE
Material seal	NBR
Material single wire seal	Silicone
	Halogen free
	High chemical resistance
Flammability UL94	V-0
Fire protection on railway vehicles (EN 45545-2)	R22: HL1, HL2, HL3 R23: HL1, HL2, HL3 R24: HL1, HL2, HL3
Limiting temperatures	-30 ... +90 °C

Mechanical characteristics

Mating cycles	
With snap-in latch	≥ 100
With metal locking lever	≥ 100
Shock and vibration (IEC 61373)	Cat. 1B
IP protection	IP20 - IP65

Inserts

Signal	Up to 12 pole
Power	Up to 16 A
Data	Cat. 5; Cat. 6A

Approvals

UL/CSA	UL 1977 ECBT2. E235076 CSA-C22.2 No. 182.3 ECBT8.E235076
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Locking mechanism with snap-in latch or robust metal locking lever.

Locking lever needs to be ordered separately



IP65 protection by single wire seal.

Single wire seal for IP 65 protection is not required if a cable adapter (09 10 000 0400) or a bulkhead mounted housing (09 10 000 0300 / 09 10 000 0800) is used.

Please contact your local HARTING Subsidiary for further information.

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. No part of this catalogue may be reproduced in any form (print, photocopy, microfilm or any other process) or pro-cessed, duplicated or distributed by means of electronic systems without the prior written consent of © HARTING Electric GmbH & Co. KG, Espelkamp.



- Door systems and ramps
- Illumination
- Headlights
- Speakes
- Indicating lights
- Warning lights
- Screens
- Door opener
- Push buttons
- Buzzers
- Windscreen wiper systems



- Tower lighting
- Emergency stops
- Sensors
- Indicating sounds
- Ventilators



- Battery storage systems
- Solar inverters
- Power plant control systems and cabinets
- Power generator sets
- Sensors



- Heater
- Fans
- Control terminals
- Industrial lighting
- Small drivers
- Vibratory conveyors
- Connections inside cabinets

Han® 3 A RJ45 IP65/IP67 connectors



Data		Cat. 5	Cat. 6A	Cat. 5	Cat. 6A
					
		With snap-in latch	With snap-in latch	For locking lever	For locking lever
	Number of contacts	4	8	4	8
	Electrical data	4 A / 48 VAC/60 VDC	0,5 A / 48 V	4 A / 48 VAC/60 VDC	0,5 A / 48 V
	Data transmission rate	100 Mbit/s	10 Gbit/s	100 Mbit/s	10 Gbit/s
	Termination	Crimp	Crimp	Crimp	Crimp
	Conductor cross-section	0.13 ... 0.82 mm ²	0.08 ... 0.25 mm ²	0.13 ... 0.82 mm ²	0.08 ... 0.25 mm ²
	Details	D-Sub contacts please order separately	har-speed M12 contacts please order separately	D-Sub contacts please order separately	har-speed M12 contacts please order separately
	Male insert	09 10 004 3001	09 10 008 3001	09 10 004 3006	09 10 008 3006
	Female insert	09 10 004 3101	09 10 008 3101	09 10 004 3106	09 10 008 3106

Han® 1 A Housings and Accessories



Connecting hardware	Housing components	Bulkhead mounted housing, straight	Bulkhead mounted housing, angled	Cable adapter	Strain relief
					
		Cable diameter		5.7 - 10 mm	
		Protection degree	IP65	IP65	IP20
		Path number	09 10 000 0300	09 10 000 0400	09 10 000 5300
Accessories		Mounting frame	Dummy plugs	Locking lever	Colour coding elements
					
	Path number	09 10 000 9908	09 10 000 9909	09 10 000 5200	09 10 000 9901 (red)
					09 10 000 9902 (blue)
					09 10 000 9903 (green)
					09 10 000 9904 (yellow)
					09 10 000 9905 (violet)

Han® 3 A RJ45 IP65/IP67 connectors



6,5 A – D-Sub / 0,5 A / 4 A-M12	Conductor cross-section		har-speed M12 Male (gold plated)	har-speed M12 Female (gold plated)	D-Sub Male (gold plated)	D-Sub Female (gold plated)
	(mm²)	(AWG)				
						
	0.13 - 0.25	26 - 23	21 01 100 9019	21 01 100 9021		
	0.09 - 0.25	28 - 24	21 01 100 9014	21 01 100 9023	09 67 000 7576	09 67 000 7476
	0.13 - 0.33	26 - 22			09 67 000 5576	09 67 000 5476
	0.25 - 0.52	24 - 20			09 67 000 8576	09 67 000 8476
	0.33 - 0.82	22 - 18			09 67 000 3576	09 67 000 3476

Crimping tool	Crimpzangen nach IEC 60352-2					
						
	Contacts / Conductor cross-section (mm²)	D-Sub / 0.09 ... 0.52	Positioner for M12 Male	Positioner for M12 Female	Positioner for D-Sub Male and Female	Han® 1 A D-Sub Insertion / Removal Tool
	Path number	09 99 000 0501	09 99 000 0525	09 99 000 0635	09 99 000 0531	09 99 000 0809



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 acc. to IEC 61076-3-106 variant 5
Number of contacts	4
Transmission performance	Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 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	5 mm – 9 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

Drawing

Dimensions in mm

Han® 3 A connector set RJ45, 4 poles
incl. housing, cable gland
and instruction manual

Plastic version, black

straight
angled

09 45 125 1100
09 45 125 1104

Metal version Standard, grey

straight
angled

09 45 115 1100
09 45 115 1104

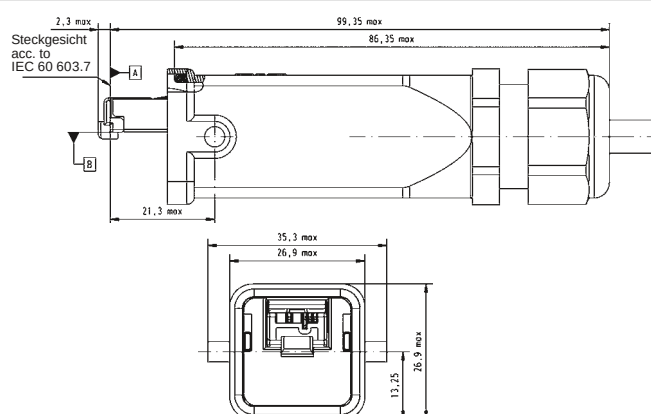
Metal version M, black

straight
angled

09 45 115 1102
09 45 115 1106

Coding pin set

09 45 820 0000



Dimensions valid for plastic version, straight



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 acc. to IEC 61076-3-106 variant 5
Number of contacts	8
Transmission performance	Category 6, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 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	5 mm – 9 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	Drawing	Dimensions in mm
Han® 3 A RJ45 connector, 8 poles, Cat. 6 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 straight	09 45 100 1560		
can be combined with Han® 3 A housing			
Coding pin set	09 45 820 0000		
Dimensions valid for plastic version, straight			



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 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 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	5 mm – 9 mm
Degree of protection	IP65 / IP67
Temperature range	-40 °C ... +70 °C
Housing material	polycarbonate, UL 94 V0, black
Plastic version	
Metal versions	
Standard	Zinc die-cast, powder coating grey
M-version	Zinc die-cast, powder coating black

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A connector set RJ45, 8 poles, Cat. 6 _A incl. housing, cable gland and instruction manual		Mating face acc. to IEC 60603-7	
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	Dimensions valid for metal version Standard	



Han® 3 A RJ45 connector

Advantages

- | | |
|-------------------|----------------------------|
| • Type/Material | RJ45
plastic, metal |
| • Category | Cat. 5/Cat. 6 _A |
| • Number of wires | 4/8 |
| • Termination | IDC |
| • Outer diameter | 5 - 13 mm |

Application

- Industrial cabling
- On machines, devices and control units

Benefits

- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- 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 acc. to IEC 61076-3-106 variant 5 |
| Number of contacts | 4/8 depending on type |
| Transmission performance | Category 5/6 _A depending on type |
| Data rate | 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s |
| Shielding | fully shielded, 360° shielding contact |
| Cable termination | tool-less with IDC contacts or preLink® IDC |
| Degree of protection | IP65 / IP67 |
| Temperature range | -40 °C ... +70 °C |
| Housing material | |
| plastic version | polycarbonate, UL 94 V0, black |
| metal version | |
| Standard | Zinc die-cast, powder coating grey |
| M version | Zinc die-cast, powder coating black |



Han® 3 A RJ45 connector

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 connector inserts 1 Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 24-22 solid and stranded Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 26-24 solid and stranded Cat. 6, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 27-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s piercing termination for AWG 28-26 stranded Cat. 6A, 4/8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003)	09 45 100 1100 09 45 100 1110 09 45 100 1560 09 45 100 1520 20 82 002 0001		
Han® 3 A connector housing M20 (with glued seal) 2 straight cable entry: – metal, grey – metal, black – plastic, grey – plastic, black – metal, EMC – stainless steel angled cable entry: – metal, grey – metal, black – plastic, grey – plastic, black – metal, EMC – stainless steel	19 20 003 1443 19 37 003 1443 19 20 003 0423 19 20 003 0426 19 62 003 1443 19 44 003 1443 19 20 003 1643 19 37 003 1643 19 20 003 0623 19 20 003 0626 19 62 003 1643 19 44 003 1643		



Han® 3 A RJ45 connector

Identification	Part number	Drawing	Dimensions in mm
M20 cable glands metal: – 5 ... 9 mm – 5 ... 12 mm – 6 ... 12 mm – 10 ... 14 mm plastic, grey: – 5 ... 9 mm – 6 ... 12 mm – 10 ... 14 mm plastic, black: – 5 ... 9 mm – 6 ... 12 mm – 10 ... 14 mm metal, EMC version: – 6.5 ... 9.5 mm – 4.0 ... 6.5 mm – 7.0 ... 10.5 mm – 9.0 ... 13.0 mm stainless steel: – 6 ... 13 mm	19 00 000 5080 19 00 000 5081 19 00 000 5082 19 00 000 5084 19 00 000 5180 19 00 000 5182 19 00 000 5184 19 00 000 5181 19 00 000 5183 19 00 000 5185 19 62 000 5080 19 62 000 5081 19 62 000 5082 19 62 000 5084 19 44 000 5082		
Accessories coding pin set for 4 different codings	09 45 820 0000		



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 angled 09 45 225 1108 Metal version Standard, grey angled 09 45 215 1108 Metal version M, black angled 09 45 215 1109 Coding pin set for 4 different codings 09 45 820 0000		Dimensions valid for plastic version	
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	



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) 1x RJ45 (IP20)
Transmission performance	Category 6, Class E _A acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 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
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Panel feed-through set, 8 poles

Plastic version, black
Metal version Standard, grey
Metal version M, black

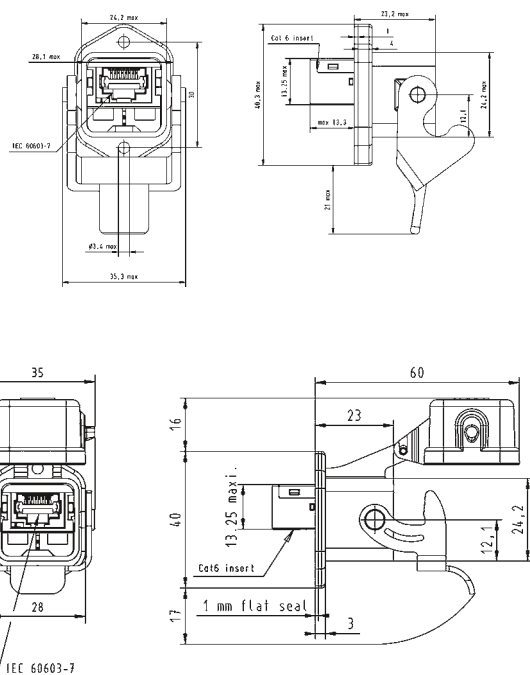
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09 45 215 1560
09 45 215 1561

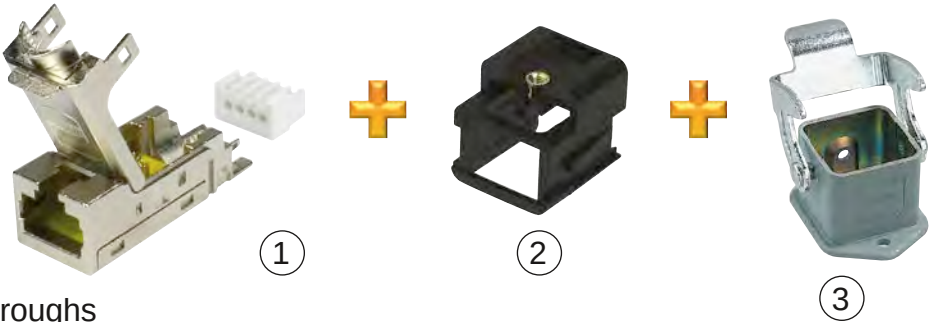
Metal version Standard, grey,
with self-closing protective cap

09 45 215 1562

Han® 3 A RJ45 10G insert Cat. 6 (for Han® 3 A housings)

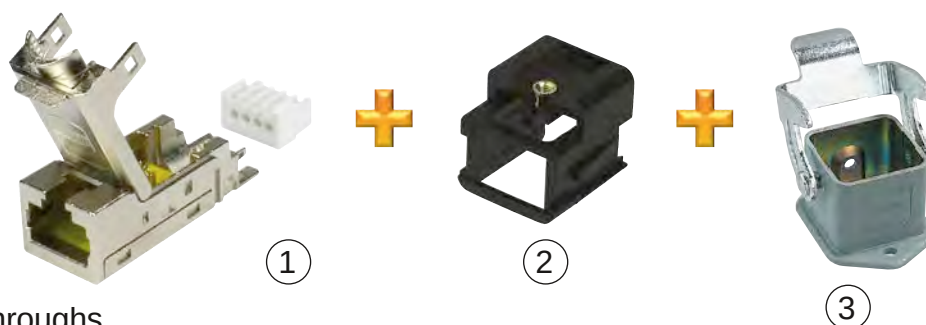
09 45 200 1560



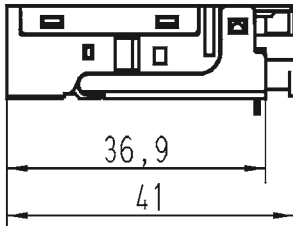
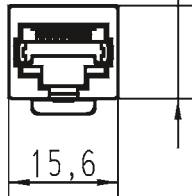
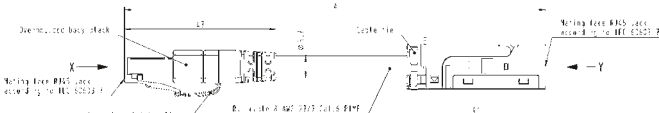


Han® 3 A RJ45 panel feed-throughs

Advantages		Technical characteristics	
Connecting hardware	• Type / Material RJ45 plastic, metal • Category Cat. 5 / Cat. 6A • Number of wires 4 / 8 • Termination IDC • Outer diameter 5 - 9 mm	Connector type	Han® 3 A connector RJ45 acc. to IEC 61076-3-106 variant 5
		Number of contacts	4 / 8 depending on type
Application		Transmission performance	Category 5 / 6A depending on type
• Industrial cabling • On machines, devices and control units		Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Benefits		Shielding	fully shielded, 360° shielding contact
• Compact and robust design • 360° shielding • Easy mounting • RJ45 mating compatible • Coding (4 variants) possible		Cable termination	tool-less with IDC contacts or preLink® IDC
		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 version	
		Standard	Zinc die-cast, powder coating grey
		M version	Zinc die-cast, powder coating black



Han® 3 A RJ45 panel feed-throughs

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 female inserts 1 Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s 10 Gbit/s IDC for AWG 28-24 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s 10 Gbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 4/8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s 10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003) Cat. 6, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s RJ45 system cable jack on connector 0.15 m ... 10.0 m Cat. 6, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s RJ45 coupler with Han® 3 A adapter 	09 45 545 1120 09 45 545 1561 09 45 545 1562 20 82 001 0001 09 45 545 1500 ... 09 45 545 1518 09 45 200 1560	  	13,15 15,6
Han® 3 A adapter for HIFF inserts 2	09 45 515 0024		



Han® 3 A
Metal Outlet, Cat. 6A, 8 pole

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® 3 A (V5) RJ45 (IP65 / IP67)
Transmission performance	Category 6, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Termination	preLink® IDC
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

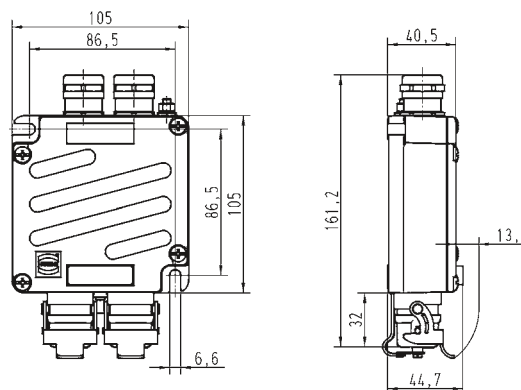
Dimensions in mm

preLink®
Han® 3 A Metal Outlet

20 82 102 0101

consists of:

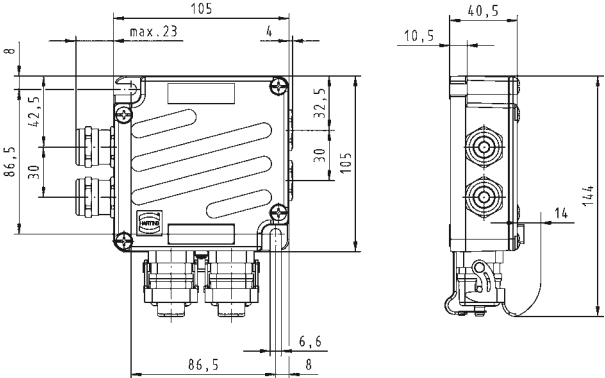
- 1x Housing including protection covers
- 2x preLink® Set RJ45 jack AWG 22/23
- 2x Cable gland with slotted seal
- 1x Assembly instruction



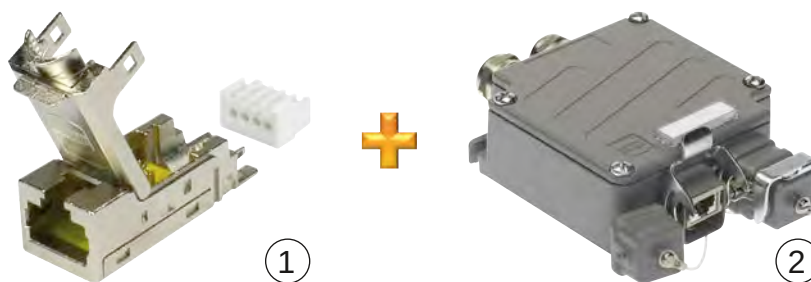


Han® 3 A RJ45
Metal Outlet, Cat. 6A, 8 pole

Advantages		Technical characteristics	
• Robust metal housing for use in harsh industrial environments • Simple mounting • Cable feeding optionally from the left or from the right side • Lockable Han® 3 A connector ports		Number of ports, Copper / Termination	2 x Han® 3 A (V5) RJ45 (IP65 / IP67)
		Transmission performance	Category 6A, Class E up to 500 MHz according to ISO/IEC 11801, EN 50173-1
		Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
		Termination	IDC
		Strand diameter	AWG 24 ... 22 solid and stranded
		Strand insulation	0.7 mm ... 1.6 mm
		Cable diameter	5 mm ... 9 mm
		Shielding	Fully shielded, 360° shielding contact
		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	Grey RAL 7037

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 Metal Outlet, Cat. 6A consisting of: 2-port metal housing with protection caps, cable glands and blanking plug, 2 x RJ45 cable jack 09 45 545 1562 Label Assembly instructions	09 45 815 1560		

Connecting hardware



Han® 3 A RJ45 Metal Outlet

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 junction box empty ① For fixture of 2x RJ45 female inserts	09 45 815 0000		
RJ45 female inserts ② Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 24-22 solid and stranded 09 45 545 1120 Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 28-24 solid and stranded 09 45 545 1561 Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 24-22 solid and stranded 09 45 545 1562 Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 solid and stranded 20 82 001 0001 Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 27/26 solid and stranded 20 82 001 0002 Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001 / 20 82 000 0003) 20 82 000 0002			



Han® 3 A RJ45, Hybrid

Advantages

• Type/Material	Han® 3 A RJ45 Hybrid (V5), plastic, metal
• Category	Cat. 5/Cat. 6/Cat. 6A
• Number of contacts	4/8 data + 4 power
• Termination	IDC
• Cable diameter	5 - 14 mm

Application

- Industrial cabling
- Within switch cabinets
- On machines and control units

Benefits

- Robust design
- Use on-site made possible via IP65 / IP67 protection
- Easy handling for applications with additional power supply
- PROFINET compliant

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, prEN 50173-1
Data rate	10 Mbit/s, 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, prEN 50173-1
Data rate	10 Mbit/s, 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	6 mm – 12 mm
Power	
Number of contacts	4 for cable diameter 1.5 mm ² stranded
Working voltage	48 V/DC
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 mm ²

Han® 3 A RJ45 Hybrid IP65/IP67 connectors



Han® 3 A RJ45, Hybrid

Identification	Part number	Drawing	Dimensions in mm
Connector, Cat. 5, 4 + 4 poles (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 (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 (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 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		

Dimensions valid for plastic version



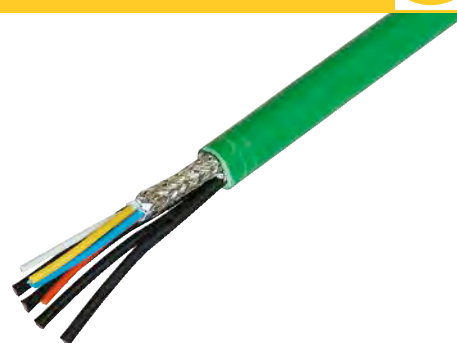
Han® 3 A RJ45 Hybrid connectors

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 connector inserts ① Cat. 6, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 27-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s piercing termination for AWG 28-26 stranded	09 45 100 1760 09 45 100 1720		
Han® 3 A connector housing M20 ② (with glued seal) straight cable entry: – metal, grey – metal, black – plastic, grey – plastic, black – metal, EMC – stainless steel angled cable entry: – plastic, grey – plastic, black	19 20 003 1443 19 37 003 1443 19 20 003 0423 19 20 003 0426 19 62 003 1443 19 44 003 1443 19 20 003 0623 19 20 003 0626		
M20 cable glands ③ metal: – 5 ... 9 mm – 5 ... 12 mm – 6 ... 12 mm – 10 ... 14 mm plastic, grey: – 5 ... 9 mm – 6 ... 12 mm – 10 ... 14 mm plastic, black: – 5 ... 9 mm – 6 ... 12 mm – 10 ... 14 mm metal, EMC version: – 6.5 ... 9.5 mm – 4.0 ... 6.5 mm – 7.0 ... 10.5 mm – 9.0 ... 13.0 mm stainless steel: – 6 ... 13 mm	19 00 000 5080 19 00 000 5081 19 00 000 5082 19 00 000 5084 19 00 000 5180 19 00 000 5182 19 00 000 5184 19 00 000 5181 19 00 000 5183 19 00 000 5185 19 62 000 5080 19 62 000 5081 19 62 000 5082 19 62 000 5084 19 44 000 5082		

Connecting hardware



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 mm ² (conductor 84 x 0.15 mm ²)
Sheath material	FRNC, halogen free
Cable outer diameter	9.7 mm
Transmission performance	Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s
Shielding	Shielding foil and shielding braid
Temperature range	-20 °C ... +70 °C
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
20 m ring
50 m ring
100 m ring
500 m reel

09 45 600 0310
09 45 600 0330
09 45 600 0340
09 45 600 0300
09 45 600 0320





Industrial Cat. 6 Hybrid
Installation cable, 8-wire

Advantages		Technical characteristics	
Connecting hardware	• Robust design for industrial environment • PROFINET-conform • Additional power supply • Hybrid Cat. 6 cable, 4-wire + 4x Power	Cable structure	4 x 2, Twisted Pair, shielded, PIMF 4 power cores
		Core structure	4 x 2 x AWG 26/7, stranded 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 11801, EN 50173-1
		Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s
		Shielding	Paired shielded with additional cable shield
		Operating temperature range	-20 °C ... +80 °C
		Colour	Black

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 6 Hybrid installation cable, 8-wire PUR 20 m ring 50 m ring 100 m drum	09 45 600 0332 09 45 600 0342 09 45 600 0302		



Han® 3 A, Hybrid, panel feed-throughs



Identification	Part number	Drawing	Dimensions in mm
Panel feed-through set Plastic version, black, Cat. 6 Metal version Standard, grey, Cat. 6 Metal version M, black, Cat. 6 Metal version EMC, Cat. 6 Metal version EMC, Cat. 6 with anti-interference capacitor	09 45 225 1760 09 45 215 1760 09 45 215 1761 09 45 215 1762 09 45 215 1765		
Protection cover for panel feed-through IP65 / IP67 Plastic version, black Metal version Standard, grey Metal version M, black	09 20 003 5449 09 20 003 5425 09 37 003 5405		



Han® 3 A RJ45 Hybrid IP65 / IP67 connectors

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 female inserts 1 Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 24-22 solid and stranded Cat. 6, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 28-24 solid and stranded Cat. 6, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 4/8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003) Cat. 6, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s RJ45 system cable jack on connector 1 m*	 09 45 545 1120 09 45 545 1561 09 45 545 1562 20 82 001 0001 09 45 545 1509	 	
Han® 3 A RJ45 Hybrid adapter for HIFF inserts with power modules 2	 09 45 200 1760		
Han® housing 3 Housing bulkhead mounting: – metal, grey – metal, black – metal, EMC	 10 12 005 1004 09 45 515 0027 09 45 515 0028		
Han® 3 A RJ45 Hybrid adapter for HIFF inserts with power modules and black Han® 3 A plastic housing 2 + 3	 09 45 225 1761		

*other lengths see page 01.28



Han® 3 A RJ45 Hybrid

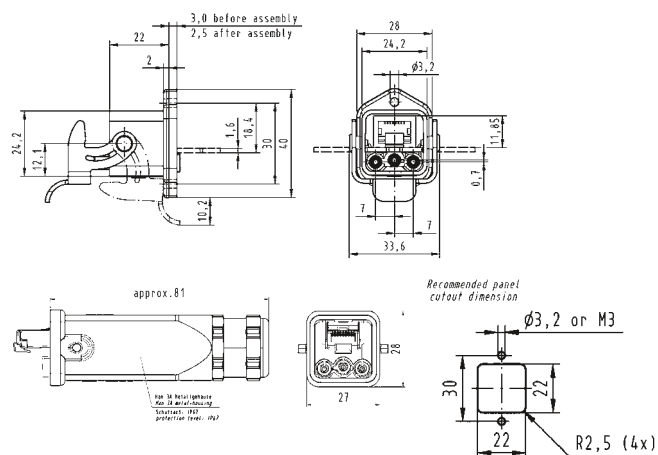
Advantages

- 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

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, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/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 0512 000		
DC version	09 57 368 0513 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		





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 Length: 1 m AC version DC version Length: 5 m AC version DC version Length: 10 m AC version DC version Length: 20 m AC version DC version	33 57 211 0010 001 33 57 211 0010 002 33 57 211 0050 001 33 57 211 0050 002 33 57 211 0100 001 33 57 211 0100 002 33 57 211 0200 001 33 57 211 0200 002	double ended a = length 	
Hybrid cable, single ended, 4 x 2 x AWG 26/7 + 3 x 2.5 mm² Length: 1 m AC version DC version Length: 5 m AC version DC version Length: 10 m AC version DC version Length: 20 m AC version DC version	33 57 111 0010 002 33 57 111 0010 001 33 57 111 0050 002 33 57 111 0050 001 33 57 111 0100 002 33 57 111 0100 001 33 57 111 0200 002 33 57 111 0200 001	Protection level: IP65 / IP67 Data part: Transmission properties in accordance with ISO/IEC 11 801: Class D single ended a = length	

Industrial Cat. 5 hybrid cable,
8-wire + 3 x 2.5 mm², PVC



Features

- Sheath material PVC
- Category Cat. 5
- Number of wires 8 + 3 x 2.5 mm²
- Wire diameter 11.9 mm

Application

- Suitable for industrial communications for outdoor applications
- Usable for transfer rate up to 1 Gigabit Ethernet 1 GBase-T acc. to IEEE 802.3ab

Benefits

- Robust design suitable for industry
- Good EMC characteristics

Technical characteristics

- Cable structure 4 x 2, Twisted Pair, shielded, SF/UTP plus 3 x 2.5 mm²
- Core structure 4 x 2 x AWG 26/7, stranded 3 x 2.5 mm²
- Sheath material PVC
- Cable sheath diameter 11.9 ± 0.4 mm
- Transmission performance Category 5, Class D up to 100 MHz acc. to EN 50288-2-2:2004
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s
- Shielding Aluminium foil overlapped tinned copper braid
- Operating temperature range
 - fix operation -40 °C ... +80 °C
 - flexible operation -40 °C ... +80 °C
- Colour Black

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 5 hybrid cable, 8-wire + 3 x 2.5 mm ² PVC			
10 m ring	33 57 851 0100 001		
20 m ring	33 57 851 0200 001		
30 m ring	33 57 851 0300 001		
100 m reel	33 57 851 1000 001		
500 m reel	33 57 851 5000 001		

Other cable lengths on request



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

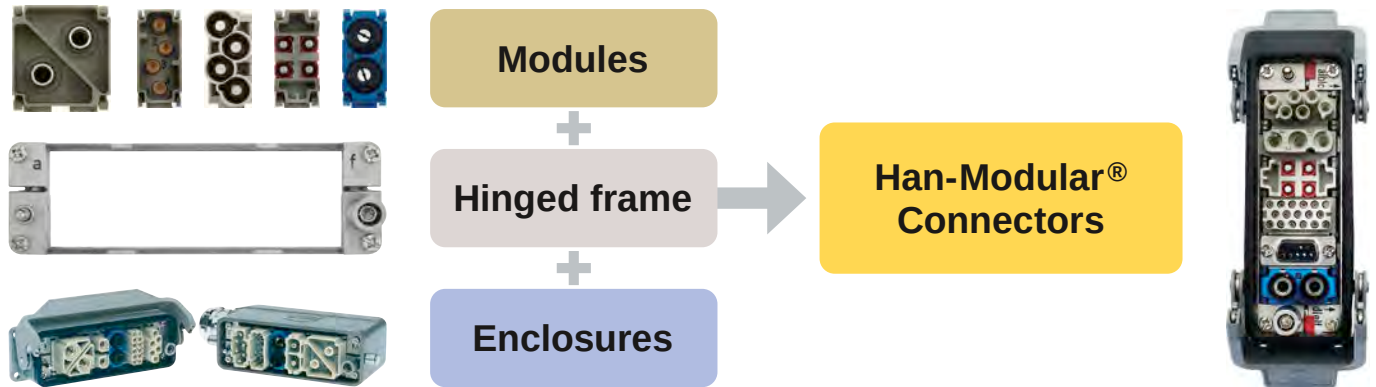
Technical characteristics

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: Multi mode GOF AC 09 57 568 0500 000 DC 09 57 568 0510 000 Data: Single mode GOF AC 09 57 568 0501 000 DC 09 57 568 0511 000			
Connector Power: 3x Han D® female contacts Data: Multi mode GOF AC 09 57 508 0500 000 DC 09 57 508 0510 000 Data: Single mode GOF AC 09 57 508 0501 000 DC 09 57 508 0511 000			

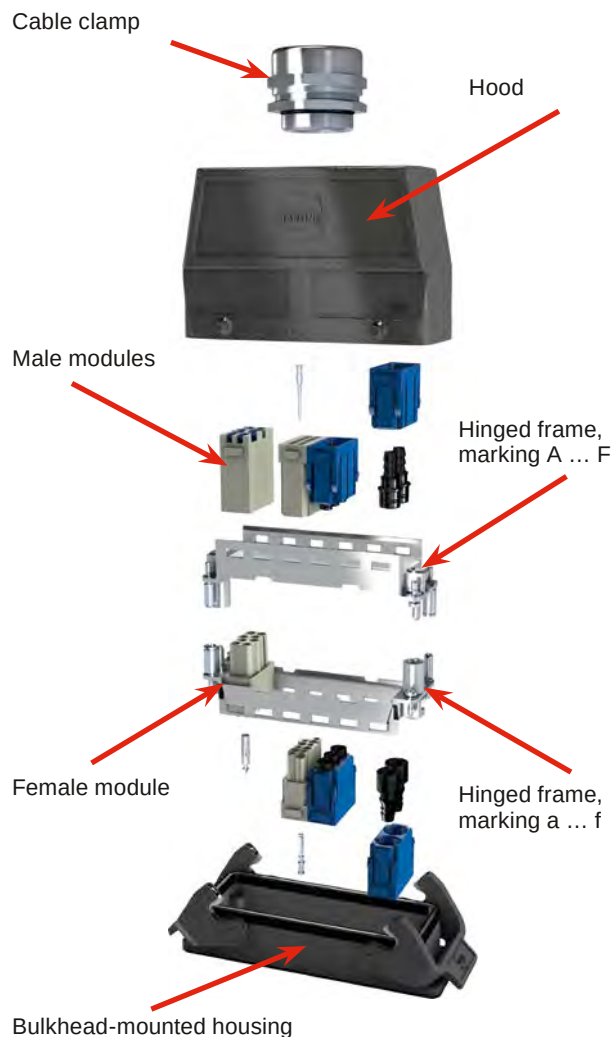
Description of the Han-Modular® system

The Han-Modular® series is designed for combining different transmission media in one connector. The multifaceted system of inserts, contacts, frames, hoods and housings as well as accessories fulfils individual customer requirements. The customer can choose between more than 50 different modules. These are suitable for different transmission media and cover various termination techniques.



The patented Han-Modular® hinged frame enables the configuration of all modules in the well-accepted Han® hoods and housings. Further additional solutions are available, e.g. suitable docking frames for drawer units. Individual customer requirements can be realised by means of the Han-Modular® series. Combining various transmission media in one single connector results in lower expenditures in installation time and production downtime. Space savings and cost savings are further benefits. The easy extension possibilities secure the ideal solution for an actual as well as future safe design.

System description



Number of contacts

8

50 V
1 A



Features

- Single module with standard shielded RJ45 plug and jack
- Cat. 6 for all data pairs (all 8 pins)
- RoHS compliant
- Patch cables are assembled/removed without tools

Technical characteristics

Contacts	8
Electrical data acc. to IEC 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
Rated voltage acc. to UL	30 V
Insulation resistance	$\geq 10^{10}$ Ohm
Limiting temperatures	-40 °C ... 70 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate
Colour (insert)	RAL 7032 (light grey)
Transmission characteristics	Category 6, Class E up to 250 MHz, according to ISO/IEC 11801 and EN 50173-1
Data rate copper	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s

Specifications / Approvals

IEC 60664-1
IEC 61984



Identification

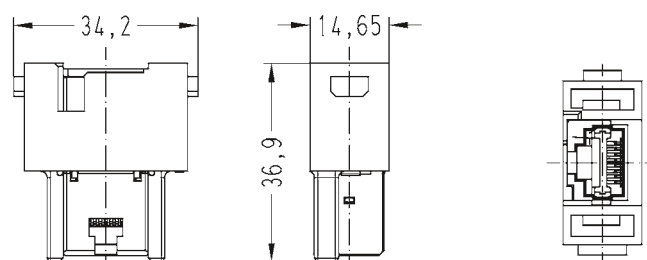
Part number

Drawing

Dimensions in mm

Han-Modular®,
Han® RJ45 module
Gender changer,
for patch cable, Cat. 6

09 14 001 4721



Features

- Compatible with Han® RJ45 male module (e.g. 09 14 001 4623)
- Category of transmission Cat. 6
- Field-assembly with *HARAX*®
- 360° shielding

Technical characteristics

Number of contacts	8
Transmission Ethernet	Category 6, Class E _A , suitable for 1/10 Gigabit
Transmission performance	Category 6, Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	110 Mbit/s, 100 Mbit/s, 1Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 ... AWG 24 AWG 24 ... AWG 22
- Conductor diameter	max. 1.6 mm (incl. insulation)
- Cable diameter	5 ... 9 mm
Mating cycles	≥ 500
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated

Number of contacts

4, 8

50 V
1 A

Features

- Single module with standard shielded RJ45 plug and jack
- The RJ45 inserts are protected by a reliable plastic insulator
- 360° shielded contact
- Field assembly without tools possible by means of *HARAX®* rapid termination in IDC technology
- Gigalink: Field assembly by means of piercing contacts
- Suitable for termination of massive and flexible wires
- Gigalink: Suitable for termination of flexible wires

Specifications / Approvals

IEC 60664-1
IEC 61984
IEC 60603-7

Technical characteristics

Contacts	8, 4
Electrical data acc. to IEC 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
Rated voltage acc. to UL	30 V
Insulation resistance	≥ 10 ¹⁰ Ohm
Limiting temperatures	-40 °C ... 70 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate, polyamide
Colour (insert)	RAL 7032 (light grey)
Transmission characteristics	Category 6A, Class E _A up to 500 MHz, acc. to ISO/IEC 11801 and EN 50173-1, Category 5, Class D up to 100 MHz, acc. to ISO/IEC 11801 and EN 50173-1, Category 6, Class E up to 250 MHz, acc. to ISO/IEC 11801 and EN 50173-1
Data rate copper	depending on used RJ45 type

Identification

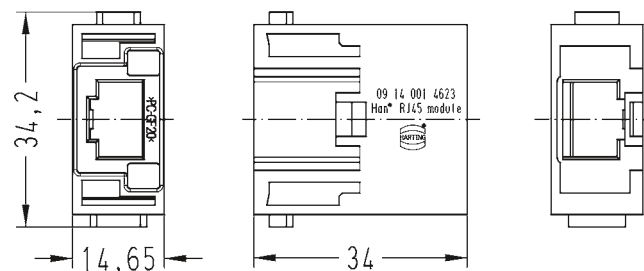
Part number

Drawing

Dimensions in mm

Han-Modular®,
Han® RJ45 module
for adapter

09 14 001 4623

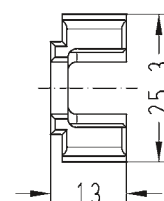
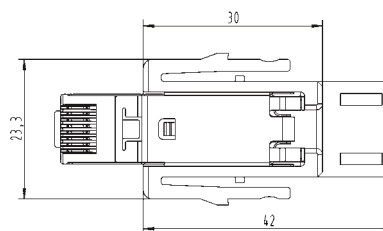


Identification	Part number	Drawing	Dimensions in mm
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Han-Modular®,
Han® RJ Industrial adapter
RJ Industrial RJ45 Gigalink connector set,
AWG 28/7 ... 24/7,
10 Mbit/s, 100 Mbit/s,
1000 Mbit/s, 10000 Mbit/s,
piercing contacts
(use tool: 09 45 800 0520),
Cat. 6A



09 45 400 1520

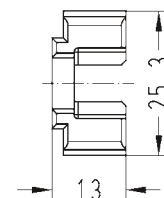
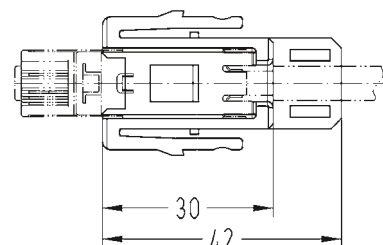


Wire outside diameter ≤ 1.05 mm

Han-Modular®,
Han® RJ Industrial adapter
RJ Industrial RJ45 connector set,
AWG 24 ... 22,
10 Mbit/s, 100 Mbit/s,
IDC contacts,
Cat. 5



09 45 400 1100

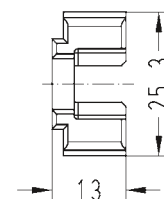
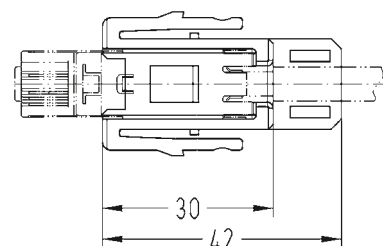


Wire outside diameter ≤ 1.6 mm

Han-Modular®,
Han® RJ Industrial adapter
RJ Industrial RJ45 connector set,
AWG 26,
10 Mbit/s, 100 Mbit/s,
IDC contacts,
Cat. 5



09 45 400 1109

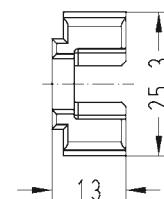
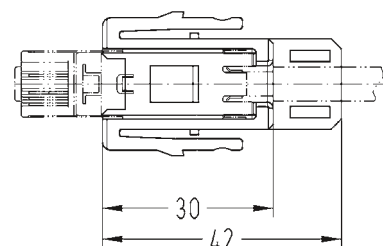


Wire outside diameter ≤ 1.6 mm

Han-Modular®,
Han® RJ Industrial adapter
RJ Industrial RJ45 connector set,
AWG 27 ... 22,
10 Mbit/s, 100 Mbit/s,
1000 Mbit/s, 10000 Mbit/s,
IDC contacts,
Cat. 6



09 45 400 1560



Wire outside diameter ≤ 1.5 mm



har-port RJ45 coupler

Advantages

- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Transmission Category 6_A, 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 _A , Class E _A acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 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		Drawing	Dimensions in mm
	silver	black		
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		
0.4 m	09 45 452 1503	09 45 452 1533		
0.5 m	09 45 452 1504	09 45 452 1534		
0.6 m	09 45 452 1505	09 45 452 1535		
0.7 m	09 45 452 1506	09 45 452 1536		
0.8 m	09 45 452 1507	09 45 452 1537		
0.9 m	09 45 452 1508	09 45 452 1538		
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		
4.5 m	09 45 452 1519			
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 RJ45 coupler

Advantages

- Type/Material RJ45
- Category 5/6_A
- Number of contacts 4/8
- Termination IDC
- Cable diameter 5 - 9 mm

Application

- For an easy access at devices, control cabinets or other distributors
- For diagnostic, maintenance and process data monitoring

Benefits

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

Technical characteristics

Connector type	RJ45
Number of contacts	4/8
Transmission performance	Category 5/6 _A Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s 1/ 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Cable termination	tool-less with IDC contacts
Conductor cross section	stranded/solid
Cable outer diameter	6 mm – 9 mm
Degree of protection	IP20
Temperature range	-40 °C ... +70 °C
Housing material	Polyamide

Identification	Part number	Drawing	Dimensions in mm
har-port panel feed-throughs to build-up customer-specific Ethernet interfaces silver black stainless steel	09 45 452 0000 09 45 452 0001 09 45 452 0002	PANEL CUT DIMENSIONS: 3,2^{+0,2} R0,8 max 24,1^{+0,4} ø22,3^{+0,4} ø27,9 2 18,4 1,5 to 5,0 panel thickness	



har-port RJ45 coupler

Identification	Part number	Drawing	Dimensions in mm
RJ45 female inserts 2 Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 28-24 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 24-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 27/26 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003) preLink® terminal module gelb für AWG 23/22 solid and stranded preLink® terminal module weiß für AWG 27/26 solid and stranded	09 45 545 1120 09 45 545 1561 09 45 545 1562 20 82 001 0001 20 82 001 0002 20 82 000 0002 20 82 000 0001 20 82 000 0003		
Accessories Unlocking tool for opening of the jacks preLink® assembly tool	20 82 000 9916 20 82 000 9901		



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		Drawing	Dimensions in mm
	silver	black		
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: 0.15 m	09 45 452 1927			
0.4 m	09 45 452 1928			
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		
4.0 m	09 45 452 1926			
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			

har-port USB coupler

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

har-port RJ45 coupler

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



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 IP40	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		

Directory Chapter 04

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General information **04.03**

Han® F + B connector **04.04**

The food industry relies on modern processing, portioning and packaging equipment. The controls (and therefore the associated Ethernet cable) hardly differ from those used in the machinery construction sector. However, all components that come into contact with food or are mounted at preparation sites are subject to special hygiene and cleaning regulations.

Thus, it is necessary to use compatible materials and also avoid any increased adhesion of dirt or bacteria.

HARTING uses only materials that comply with FDA 21 in our Han® F+B product series.

All facility and cabling components must also be rigorously and continuously cleaned. This results in additional, tougher demands on the cabling components compared to general industry requirements.

These include a higher degree of IPx protection and higher temperature requirements – so that long-term exposure to high-pressure steam cleaners causes

no malfunction or damage. Therefore, HARTING products in the Han® F+B series are designed with IP69K protection for a wide temperature range.

The Han® F+B series follows the “Easy to Clean” design in accordance with ISO 14 159 and DIN EN 1672-2. It is also certified according to the Ecolab Directive.

Currently, the Han® F+B portfolio for Ethernet cabling includes:

- RJ45 connectors for Fast Ethernet in Category 5
- RJ45 connectors for Gigabit Ethernet in Category 6A
- Matching protective housings with Han® 3 A design (according to IEC 61 076-3-106, variant 5)
- Connector housings based on M25 with the corresponding cable glands
- Accessories



Han® F+B Ethernet connector for food industry

Features

- Connector type RJ45
- Category 5 / 6 / 6A
- Number of contacts 4 or 8

Application

- Machines for food industry
- Bottling plants
- Packaging machines
- Application areas
 - Interface inside the splash zone
 - Connections with chemical resistance and high cleaning cycles

Benefits

- Degree of protection IP69K
- Resistant against cold and heat
- Certified acc. to Ecolab
- „Easy to Clean“ design acc. to ISO 14 159 and DIN EN 1672-2
- Materials acc. to FDA 21

Benefits

Strain relief

A suitable strain relief is required to enable the F+B connector to resist the stress caused e.g. by the daily cleaning of the machinery.

DIN VDE 0100-520: 2013-6 defines the stress relief for a connector depending on the outer diameter of the cable.

Technical characteristics

Connector type	RJ45 acc. to IEC 61076-3-106 variant 5
Number of contacts	4
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
Data rate	10 Mbit/s, 100 Mbit/s
Number of contacts	8
Transmission performance	Category 6A / Class E _A up to 500 MHz acc. to ISO/IEC 11801, EN 50 173-1
Data rate	10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Housing	
Housing material	PP
Sealing material outside	EPDM/TPE
Limiting temperature	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60529 if mated	IP67 / IP69K
Housing locking	Screw locking
Materials and resistances	
Housing materials with FDA 21 approval	
Ecolab® tested	P3-topax 52 P3-topax 19 P3-topax 66 P3-topax 99 P3-topax 56 P3-topax 200
Acigel, Supergel, Tego 2000	

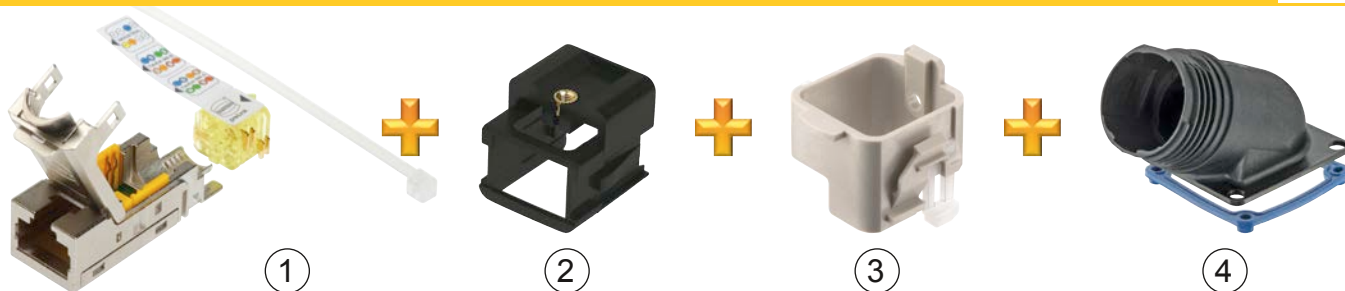


Han® F+B Ethernet connector for food industry

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 connector inserts ① Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 24-22 solid and stranded Cat. 5, 4 poles, 10 Mbit/s, 100 Mbit/s IDC for AWG 26-24 solid and stranded Cat. 6, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s IDC for AWG 27-22 solid and stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s piercing termination for AWG 28-26 stranded Cat. 6A, 8 poles, 10 Mbit/s, 100 Mbit/s and 1 Gbit/s, 10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003)	09 45 100 1100 09 45 100 1110 09 45 100 1560 09 45 100 1520 20 82 002 0001		
Han® F+B adapter for Han® 3 A inserts ②	09 15 503 9911		
Han® F+B connector housing M25 ③	19 15 503 1402		
Han® F+B cable glands M25 cable glands plastic ④ Sealing range 5 – 8 mm	19 15 503 5290		
Accessories Protection cap for Han® F+B connector housing	09 15 503 5411		



Connectors for food and beverage



Han® F+B Ethernet panel feed-throughs for food industry

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A adapter for HIFF inserts ②	09 45 515 0024		
Han® F+B adapter for Han® 3 A inserts ③	09 15 503 9911		
Han® F+B Housing bulkhead mounting ④ Straight type Angled type Housing cable-to-cable	09 15 503 0301 09 15 503 0901 09 15 503 1701		
Accessories Protection cap for Han® F+B Housing bulkhead mounting	09 15 503 5401		



Directory Chapter 05

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HARTING M12 system cable, 4-wire	05.07
Ha-VIS EtherRail® stranded railway cords, 4-wire	05.12
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Han-Quintax® module	05.30
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Han® MegaBit module	05.38
Han® GigaBit module	05.40
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Ha-VIS WTB data bus cable	05.46
D-Sub InduCom	05.50



Manufacturers and suppliers of railway vehicles as well as railway operators have relied on HARTING products for many years. This has resulted in very productive cooperation on several levels. The extremely robust and durable Han® connectors are now practically the standard used for almost all locomotives, railcars and long-haul and regional trains worldwide.

HARTING's range of solutions and products for these applications is very broad. This cabling catalogue, therefore, presents only the specific data networking components for Ethernet, WTB and MVB cabling (MVB = Multifunction Vehicle Bus, WTB = Wire Train Bus; both bus systems are still widely in use but are increasingly being replaced by Ethernet).

Specifically, these are:

- HARTING EtherRAIL® data cables (Category 5) for Fast Ethernet (100 Mbit/s), for installations in and on trains
- M12 D-coded connectors (IP65 / IP67) and RJ45 (IP20)
- HARTING EtherRAIL® data cables (Category 5) for Fast Ethernet (100 Mbit/s), for installations between railcars (very flexible)
- HARTING connectivity: Han Quintax® and Han® MegaBit modules specifically for railcar couplings
- HARTING EtherRAIL® data cables (Category 7) for Gigabit Ethernet and 10 GB, for installations in, on and between railcars
- har-speed M12 X-coded connectors (IP65 / IP67) for Gigabit Ethernet and 10 GB, installed in and on the train

- HARTING connectivity: Han Quintax® High Density and Han® GigaBit modules specifically for railcar couplings
- HARTING MVB and WTB bus cable
- HARTING D-Sub InduCom connection technology

All of these HARTING products are designed, manufactured and certified in accordance with the specific requirements of the railway sector.

These requirements are:

- Extremely high demands for vibration resistance (contact reliability, plug-in security, etc.)
- Above-average service life (e.g. 30 years or longer)
- High transmission reliability for all operating modes of the train (shielding, EMC safety)
- Extremely high temperature range (e.g. from -40 °C to +90 °C)
- Demanding safety requirements in case of fire (extensive fire tests in compliance with international, European, national and even company-specific regulations)

There are very few pre-assembled system cables listed in this catalogue. This is because the requirements mentioned above and the associated product tests lead to specific requirements for length, labelling and packaging that rule out standard products.

HARTING HCS (<http://www.harting-customised-solutions.com/en/home/>) provides customised solutions in the railway sector.



HARTING RJ Industrial®
system cable, overmoulded, 4-wire, straight

Features

- Connector types RJ45
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material Elastomer,
electron beam cross-linked

Application

- For harsh industrial environments
- For installation in railway applications

Benefits

- Robust design
- Fire protection acc. to EN 45545-1, -2 and -5

Technical characteristics

- Connector types 1 x resp. 2 x HARTING RJ Industrial® RJ45, overmoulded
- Railway cords type 4 x AWG 22/7, stranded
- Sheath material Elastomer,
electron beam cross-linked
- Wiring 4 pole, 1:1
- Transmission performance Class D up to 100 MHz
acc. to ISO/IEC 11801,
EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded,
360° shielding contact
- Operating temperature range -40 °C ... +70 °C
- Colour Black



HARTING RJ Industrial® system cable, overmoulded, 4-wire, straight

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® system cable, 4-wire one side assembled	Black		
Length	0.5 m 1.0 m 2.0 m 3.0 m 5.0 m 10.0 m	09 45 771 0211 09 45 771 0212 09 45 771 0214 09 45 771 0215 09 45 771 0216 09 45 771 0217	
both sides assembled	Black		
Length	0.5 m 1.0 m 2.0 m 3.0 m 5.0 m 10.0 m	09 45 771 1212 09 45 771 1213 09 45 771 1219 09 45 771 1215 09 45 771 1216 09 45 771 1223	

Other cable lengths on request



Advantages

- ## Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	4
Transmission category	Category 5e, Class D
Transmission performance	Category 5e, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
Data rate	10 Mbit/s, 100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable railway cords	
- 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 No.	Drawing	Dimensions in mm
HARTING RJ Industrial® EtherRail® RJ45 connector set, 4 poles straight version	09 45 151 1122		(51) 55 13.7 9.2 (16.1) 6.32 9.13 CONTACT No. 1, 2, 3 CONTACT No. 6 position — 1 8 cable RJ45 - 9mm mating face acc. to IEC 60603-7

Identification	Colour	Part No.
Colour clips for colour coding the HARTING RJ Industrial® EtherRail® RJ45 connector 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



HARTING M12
system cable, 4-wire, straight resp. angled

Features

- Connector types M12 D-coding, connector straight resp. angled
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material Elastomer, electron beam cross-linked

Application

- For harsh industrial environments
- For installation in railway applications

Benefits

- Robust design
- Protection degree IP65 / IP67
- Fire protection acc. to EN 45545-1, -2 and -5

Technical characteristics

- Connector types HARTING M12 D-coding, overmoulded
- Railway cords type 4 x AWG 22/7, stranded
- Sheath material Elastomer, electron beam cross-linked
- Wiring 4 pole, 1:1
- Transmission performance Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range
fix operation -40 °C ... +85 °C
- Colour Black or blue

Other cable lengths on request



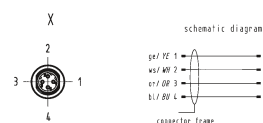
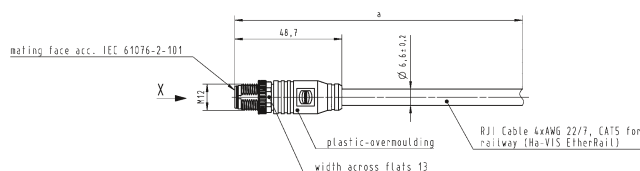
HARTING M12 system cable, 4-wire, straight resp. angled

Identification	Part number	Drawing	Dimensions in mm
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HARTING
M12 system cable,
4-wire, straight
one side assembled

Black

Length	0.5 m	09 48 220 0011 005
	1.0 m	09 48 220 0011 010
	2.0 m	09 48 220 0011 020
	2.5 m	09 48 220 0011 025
	5.0 m	09 48 220 0011 050
	7.5 m	09 48 220 0011 075
	10.0 m	09 48 220 0011 100
	15.0 m	09 48 220 0011 150
	20.0 m	09 48 220 0011 200



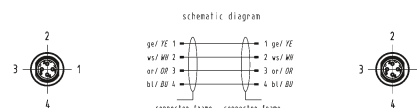
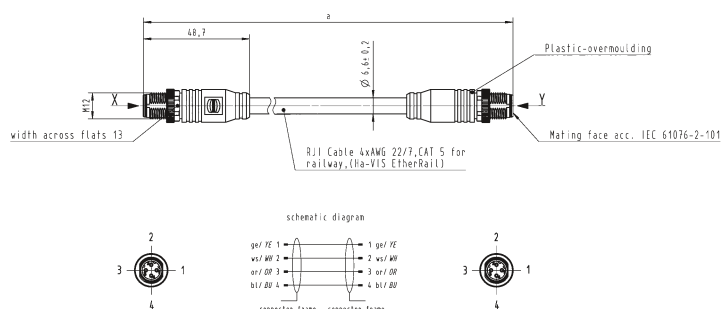
Blue

Length	0.5 m	21 33 390 0413 005
	1.0 m	21 33 390 0413 010
	2.0 m	21 33 390 0413 020
	2.5 m	21 33 390 0413 025
	5.0 m	21 33 390 0413 050
	7.5 m	21 33 390 0413 075
	10.0 m	21 33 390 0413 100
	15.0 m	21 33 390 0413 150
	20.0 m	21 33 390 0413 200

both sides assembled

Black

Length	0.5 m	09 48 222 2011 005
	1.0 m	09 48 222 2011 010
	2.0 m	09 48 222 2011 020
	2.5 m	09 48 222 2011 025
	5.0 m	09 48 222 2011 050
	7.5 m	09 48 222 2011 075
	10.0 m	09 48 222 2011 100
	15.0 m	09 48 222 2011 150
	20.0 m	09 48 222 2011 200





HARTING M12
system cable, 4-wire, straight resp. angled

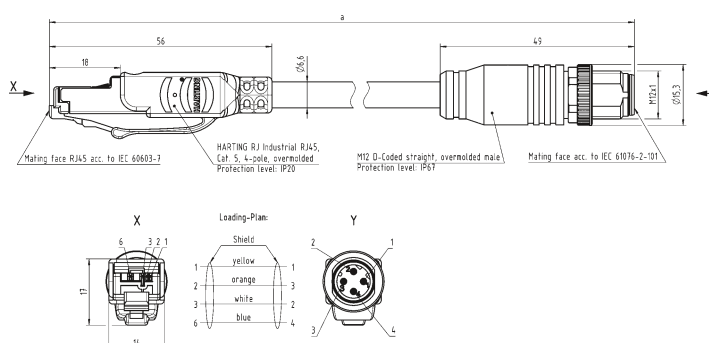
Identification		Part number	Drawing	Dimensions in mm
HARTING M12 system cable, 4-wire, angled				
one side assembled				
		Black		
Length	0.5 m	09 48 800 0011 005		
	1.0 m	09 48 800 0011 010		
	2.0 m	09 48 800 0011 020		
	2.5 m	09 48 800 0011 025		
	5.0 m	09 48 800 0011 050		
	7.5 m	09 48 800 0011 075		
	10.0 m	09 48 800 0011 100		
	15.0 m	09 48 800 0011 150		
	20.0 m	09 48 800 0011 200		
both sides assembled				
		Black		
Length	0.5 m	09 48 808 0011 005		
	1.0 m	09 48 808 0011 010		
	2.0 m	09 48 808 0011 020		
	2.5 m	09 48 808 0011 025		
	5.0 m	09 48 808 0011 050		
	7.5 m	09 48 808 0011 075		
	10.0 m	09 48 808 0011 100		
	15.0 m	09 48 808 0011 150		
	20.0 m	09 48 808 0011 200		



HARTING
M12/RJ45 system cable,
4-wire

Black

Length	1.0 m	09 48 022 2011 010
	1.5 m	09 48 022 2011 015
	2.0 m	09 48 022 2011 020
	3.0 m	09 48 022 2011 030
	5.0 m	09 48 022 2011 050
	7.5 m	09 48 022 2011 075
	10.0 m	09 48 022 2011 100
	15.0 m	09 48 022 2011 150
	20.0 m	09 48 022 2011 200





HARTING M12 system cable, 4-wire, straight, PushPull Press & Go

Features

- Connector types M12 D-coding PushPull
- Category Cat. 5
- Number of wires 4
- Wiring 1:1
- Sheath material Elastomer, electron beam cross-linked

Application

- For harsh industrial environments
- For installation in railway applications

Benefits

- Robust design
- Protection degree IP65 / IP67
- Fire protection acc. to EN 45545-1, -2 and -5
- M12 PushPull for a fast and vibration-free connection

Technical characteristics

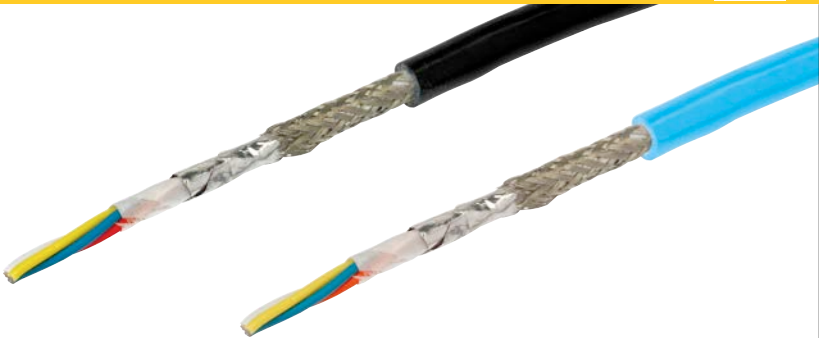
- Connector types HARTING M12 D-coding PushPull
- Railway cords type 4 x AWG 22/7, stranded
- Sheath material Elastomer, electron beam cross-linked
- Wiring 4 pole, 1:1
- Transmission performance Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
- Data rate 10 Mbit/s, 100 Mbit/s
- Shielding Fully shielded, 360° shielding contact
- Operating temperature range fix operation -40 °C ... +85 °C
- Colour Black

Identification	Part number	Drawing	Dimensions in mm
HARTING M12 system cable, 4-wire both sides assembled	Black		
Length 1.0 m 1.5 m 2.0 m 3.0 m 5.0 m 10.0 m	21 33 232 3401 010 21 33 232 3401 015 21 33 232 3401 020 21 33 232 3401 030 21 33 232 3401 050 21 33 232 3401 100		

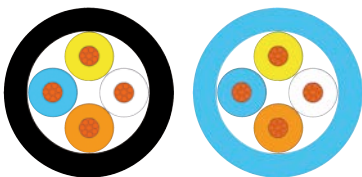
Other cable lengths on request

Ha-VIS EtherRail®

stranded railway cords, Cat. 5, 4-wire



Features		Technical characteristics	
• Sheath material	Elastomer, electron beam cross-linked	Cable structure	Star quad, double shielding
• Category	5	Core structure	4 x AWG 22/7, tinned copper wire, stranded
• Number of wires	4	Wire insulation	PE-Foam Skin, Ø 1.5 mm
• Wire design	AWG 22/7	Sheath material	Elastomer, electron beam cross-linked
• Wire diameter	(6.6 ± 0.2) mm	Cable sheath diameter	6.6 ±0.2 mm
Application		Transmission performance	Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50 173-1
• For installation within and outside rail vehicles		Data rate	10 Mbit/s, 100 Mbit/s
Benefits		Shielding	Shielding foil and shielding braid
• Robust design		Operating temperature range	fix operation -40 °C ... +85 °C flexible operation -25 °C ... +70 °C
• Fire protection acc. to EN 45545-1, -2 and -5		Standard lengths	100 m/500 m/1000 m
• Flame-retardant and heat resistant acc. to DIN 5510 (1-4) and EN 50264-1		Colour	Black or blue
• UV protected			
• RoHS compliant			
• Halogen free			
• Small Ø permits RJ45 assembly			

Identification	Part number Elastomer		Drawing	Dimensions in mm
Ha-VIS EtherRail® stranded railway cords, Cat. 5 4-wire	Black	Blue		
10 m ring	09 45 600 0168	09 45 600 1400		
50 m ring	09 45 600 0178	09 45 600 1410		
100 m ring	09 45 600 0108	09 45 600 1420		
500 m drum	09 45 600 0118	09 45 600 1430		
1000 m drum	09 45 600 0128	09 45 600 1440		



Ha-VIS EtherRail® ultra flexible railway cords, Cat. 5, 4-wire

Features

- Sheath material: Elastomer, electron beam cross-linked
- Category: 5
- Number of wires: 4
- Wire design: AWG 22/19
- Wire diameter: (7.4 ± 0.1) mm

Application

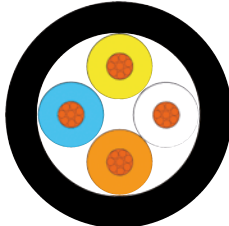
- For installation within and outside rail vehicles and especially between coaches

Benefits

- Robust design, especially suitable between coaches
- Fire protection acc. to EN 45545-1, -2 and -5
- Flame-retardant and heat resistant acc. to DIN 5510 (1-4) and EN 50264-1
- UV protected
- RoHS compliant
- Halogen free

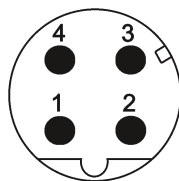
Technical characteristics

- Cable structure: Star quad, double shielding
- Core structure: 4 x AWG 22/19, tinned copper wire, ultra flexible
- Wire insulation: PE, Ø 1.98 mm
- Sheath material: Elastomer, electron beam cross-linked
- Cable sheath diameter: 7.4 ± 1 mm
- Transmission performance: Category 5, Class D up to 100 MHz acc. to ISO/IEC 11801, EN 50173-1
- Data rate: 10 Mbit/s, 100 Mbit/s
- Shielding: Shielding foil and shielding braid
- Operating temperature range: -40 °C ... +90 °C
- Standard lengths: 100 m/500 m/1000 m
- Colour: Black

Identification	Part number Elastomer	Drawing	Dimensions in mm
Ha-VIS EtherRail® ultra flexible railway cords, Cat. 5 4-wire	Black		
10 m ring 50 m ring 100 m ring 500 m drum 1000 m drum	09 45 600 0188 09 45 600 0189 09 45 600 0138 09 45 600 0148 09 45 600 0158		



Mating face



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



Identification

Part number

Drawing

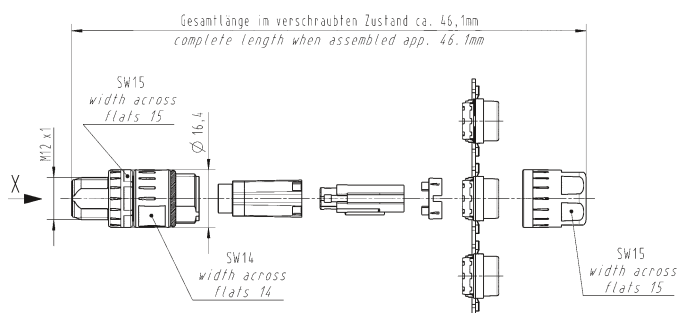
Dimensions in mm

M12 Crimp Slim design, shielded



Male
4 poles, D-coding
Railway cords: 5.7 - 8.8 mm
outer diameter

21 03 881 1405*

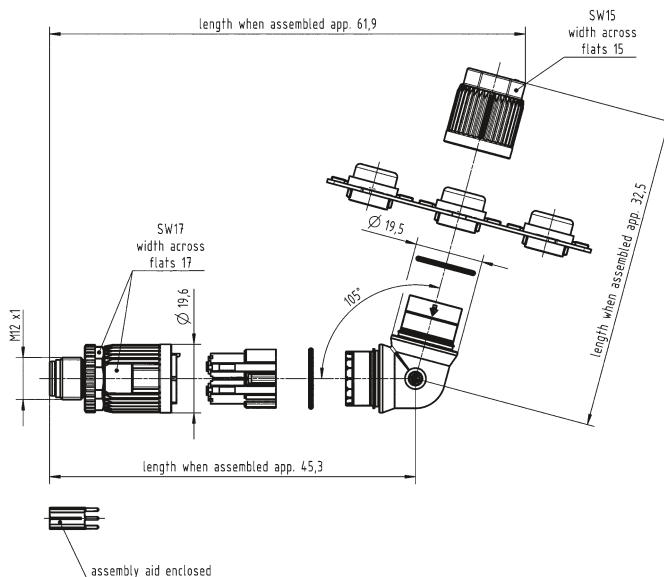


M12 Crimp, shielded



Male
4 poles, D-coding
angled

21 03 882 3405*

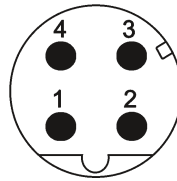


Further information and data sheets see www.HARTING.com

* UL approval is in preparation



Mating face

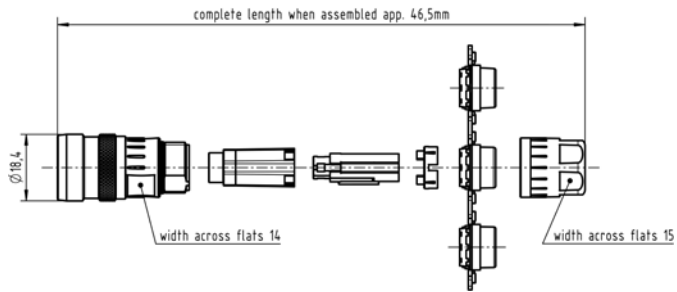


D-coding
Mating face
acc. to IEC 61076-2-101



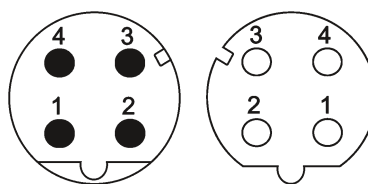
Applications / Advantages

- 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  Male straight version 4 poles, D-coding, IP54 Cable diameter: 5.7 - 8.8 mm	21 03 881 1430		



Mating face

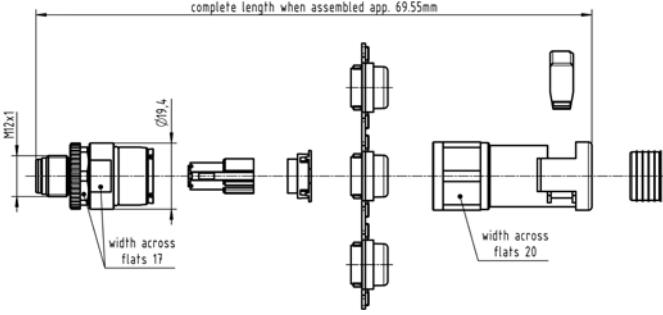
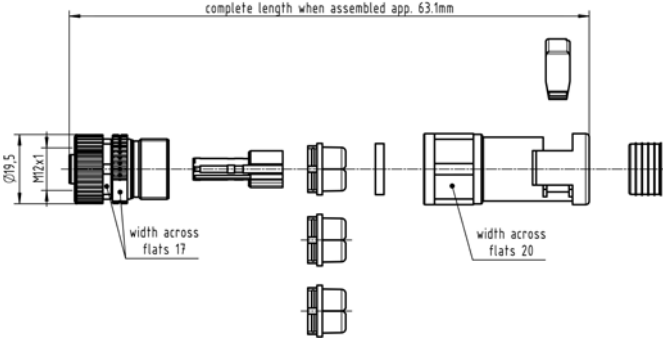


D-coding
Mating face
acc. to IEC 61076-2-101



Applications/Advantages

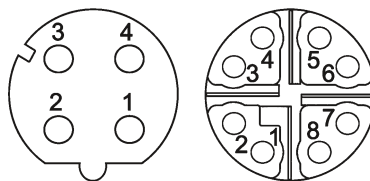
- M12 connector with the option to connect a plastic tube to protect the cable assembly in rough applications
- Robust design for IP65 / IP67 environments
- A- and D-coding available with crimp termination
- 360° shielding

Identification	Part number	Drawing	Dimensions in mm
M12 connector with PMA connection for PVC tube NW10  Male 4 poles, D-coding	21 03 882 1411		
M12 connector with PMA connection for PVC tube NW10  Female 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.



Mating face



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



Identification

Part number

Drawing

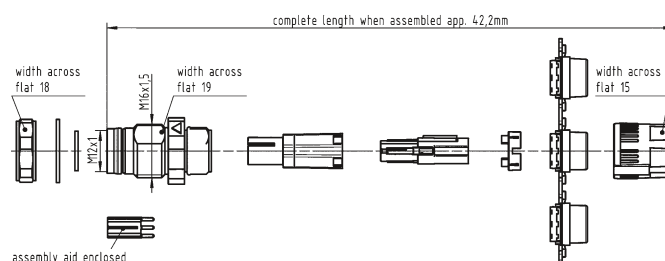
Dimensions in mm

M12 PFT Slim Design



Female
4 poles, D-coding

21 03 881 2425

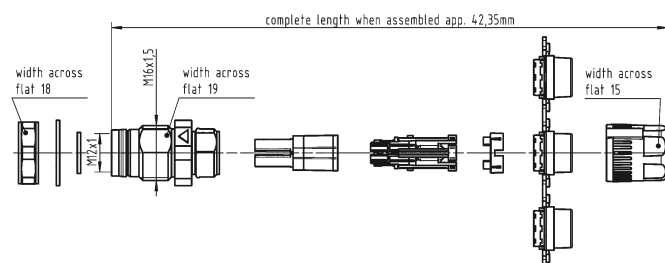


M12 PFT Slim Design



Female
8 poles, X-coding
0.08 - 0.25 mm²
AWG 28 - 23

21 03 881 2825



HARTING RJ Industrial® 10G system cable, 8-wire, straight



Features

• Connector type	HARTING RJ Industrial® 10 G
• Category	6 _A
• Number of wires	8
• Wire design	AWG 24/7
• Wire diameter	(8.1 ± 0.4) mm
• Sheath material	Elastomer, electron beam cross-linked

Application

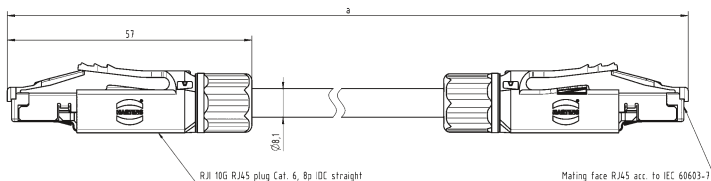
- For harsh industrial environments
- For installation in railway applications

Benefits

- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- Fire protection acc. EN 45545-1, -2 and -5, flame retardant and heat resistant acc. DIN 5510 (1-4) and EN 50 264-1
- UV resistant, RoHS conform, halogen free LSZH

Technical characteristics

Connector types	HARTING RJ Industrial® 10 G
Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Railway cords type	4 x 2 x AWG 24/7 Category 7, Class F up to 600 MHz acc. to ISO/IEC 11801 and EN 50 173-1
Sheath material	Elastomer, electron beam, cross-linked
Cable sheath diameter	(8.1 ± 0.4) mm
Transmission performance	Category 6 _A , Class E _A up to 500 MHz acc. to ISO/IEC 11801 and EN 50 173-1
Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-40 °C ... +80 °C
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® 10G system cable, 8-wire both sides assembled	Black		
Length			
0.5 m	09 48 636 3751 005		
1.0 m	09 48 636 3751 010		
2.0 m	09 48 636 3751 020		
5.0 m	09 48 636 3751 050		
7.5 m	09 48 636 3751 075		
10.0 m	09 48 636 3751 100		

Other cable lengths on request



HARTING M12
system cable, 8-wire, straight

Features

- Connector type M12 X-coding
- Category 6_A
- Number of wires 8
- Wire design AWG 24/7
- Wire diameter (8.1 ± 0.4) mm
- Sheath material Elastomer, electron beam cross-linked

Application

- For harsh industrial environments
- For installation in railway applications

Benefits

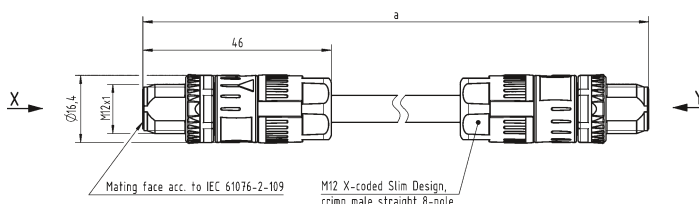
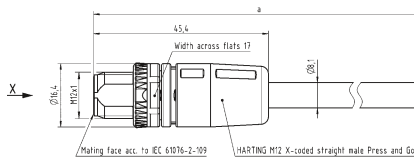
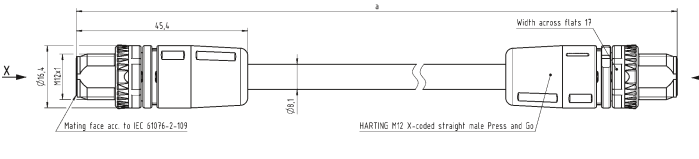
- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- Fire protection acc. EN 45545-1, -2 and -5, flame retardant and heat resistant acc. DIN 5510 (1-4) and EN 50264-1
- UV resistant, RoHS conform, halogen free LSZH

Technical characteristics

- Connector types HARTING M12 X-coding
- Cable structure 4 x 2, Twisted Pair, shielded, PIMF
- Railway cords type 4 x 2 x AWG 24/7
Category 7, Class F
up to 600 MHz
acc. to ISO/IEC 11801
and EN 50173-1
- Sheath material Elastomer, electron beam, cross-linked
- Cable sheath diameter (8.1 ± 0.4) mm
- Transmission performance Category 6_A, Class E_A
up to 500 MHz
acc. to ISO/IEC 11801
and EN 50173-1
- Data rate 10 Mbit/s, 100 Mbit/s, 1 Gbit/s,
2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
- Shielding Paired shielded with additional cable shield
- Operating temperature range -40 °C ... +80 °C
- Colour Black

HARTING M12 system cable, 8-wire, straight



Identification	Part number	Drawing	Dimensions in mm
HARTING M12 system cable, 8-wire, Slim Design both sides assembled	Black		
HARTING M12 system cable, 8-wire, Press & Go one side assembled	Black		
HARTING M12 system cable, 8-wire, Press & Go both sides assembled	Black		

Other cable lengths on request



HARTING M12
system cable, 8-wire, straight, PushPull Press & Go

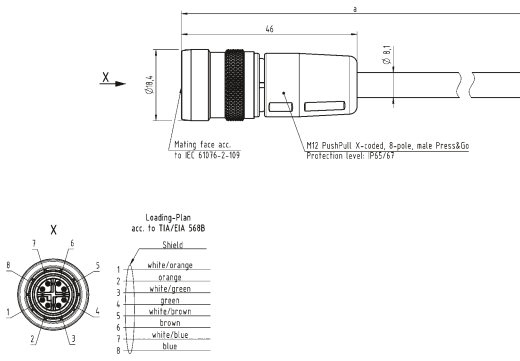
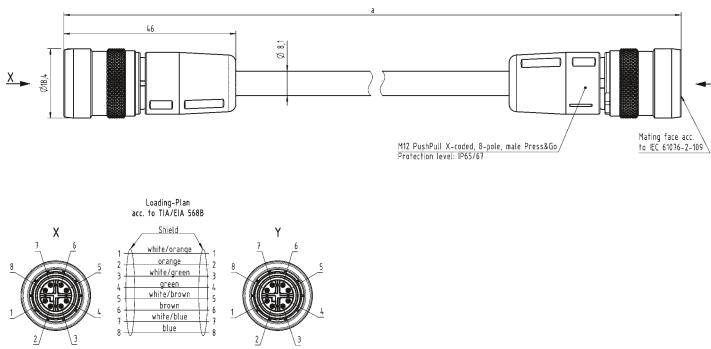
Features		Technical characteristics	
• Connector type	M12 X-coding PushPull	Connector types	HARTING M12 X-coding PushPull
• Category	6A	Cable structure	4 x 2, Twisted Pair, shielded, PIMF
• Number of wires	8	Railway cords type	4 x 2 x AWG 24/7 Category 7, Class F up to 600 MHz acc. to ISO/IEC 11801 and EN 50 173-1
• Wire design	AWG 24/7	Sheath material	Elastomer, electron beam, cross-linked
• Wire diameter	(8.1 ± 0.4) mm	Cable sheath diameter	(8.1 ± 0.4) mm
• Sheath material	Elastomer, electron beam cross-linked	Transmission performance	Category 6A, Class EA up to 500 MHz acc. to ISO/IEC 11801 and EN 50 173-1
Application		Data rate	10 Mbit/s, 100 Mbit/s, 1 Gbit/s, 2,5 Gbit/s, 5 Gbit/s, 10 Gbit/s
• For harsh industrial environments		Shielding	Paired shielded with additional cable shield
• For installation in railway applications		Operating temperature range	-40 °C ... +80 °C
Benefits		Colour	Black
• Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services			
• Fire protection acc. EN 45545-1, -2 and -5, flame retardant and heat resistant acc. DIN 5510 (1-4) and EN 50264-1			
• UV resistant, RoHS conform, halogen free LSZH			
• M12 PushPull for a fast and vibration-free connection			

Other cable lengths on request

HARTING M12

system cable, 8-wire, straight, PushPull Press & Go



Identification	Part number PVC	Drawing	Dimensions in mm
HARTING M12 system cable, 8-wire, PushPull Press & Go one side assembled	Black		
both sides assembled	Black		



Ha-VIS EtherRail® stranded railway cords, Cat. 7, 8-wire

Features

- Sheath material: Elastomer, electron beam cross-linked
- Category: 7
- Number of wires: 8
- Wire design: AWG 24/7
- Wire diameter: (8.1 ± 0.4) mm

Application

- For installation within and outside rail vehicles and buses

Benefits

- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- For installation within and outside rail vehicles and buses
- Fire protection acc. EN 45545-1, -2 and -5, flame retardant and heat resistant acc. DIN 5510 (1-4) and EN 50264-1
- UV resistant, RoHS conform, halogen free LSZH
- Designed to be compatible with products from HARTING like *har-speed* M12 Crimp, Han® GigaBit module and RJ45 10G.

Technical characteristics

- Cable structure: 4 x 2, Twisted Pair, shielded, PIMF
- Core structure: 4 x 2 x AWG 24/7, tinned copper wire
- Wire insulation: PE, Ø 1.45 mm
- Sheath material: Elastomer, electron beam, cross-linked
- Cable sheath diameter: (8.1 ± 0.4) mm
- Transmission performance: Category 7, Class D, E, E_A, F up to 600 MHz acc. to ISO/IEC 11801 and EN 50173-1
- Data rate: 1 Gbit/s, 10 Gbit/s
- Shielding: Paired shielded with additional cable shield
- Operating temperature range: -40 °C ... +80 °C
- Colour: Black

Identification

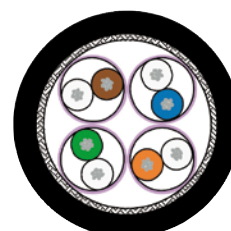
Ha-VIS EtherRail®
flexible data cable, PIMF
4x2xAWG 24/7, Cat. 7

10 m ring
50 m ring
100 m ring
500 m reel
1000 m reel

Part number

09 45 600 0694
09 45 600 0693
09 45 600 0692
09 45 600 0691
09 45 600 0690

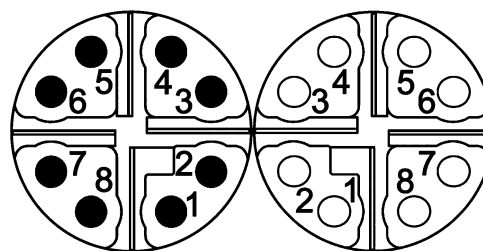
Drawing



Dimensions in mm

Number of contacts

8

Crimp termination
Shielded

Technical characteristics

Number of contacts	8
Rated current	0.5 A
Rated voltage	48 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Mating cycles	≥ 500
Wire outer diameter	≤ 1.4 mm
Locking type	Screw locking, PushPull
Degree of protection acc. to IEC 60529	IP65 / IP67, when mated
Conductor cross-section	0.08 ... 0.25 mm ² , 0.13 ... 0.25 mm ² , 0.08 ... 0.22 mm ²
Conductor cross-section	AWG 28 ... AWG 23, AWG 26 ... AWG 23, AWG 28 ... AWG 24
Cable diameter	5.7 ... 8.8 mm, 8.1 mm

Technical characteristics

Transmission characteristics	Cat. 6A, Class EA up to 500 MHz
Tightening torque	0.6 Nm, 2 Nm Lock nut
Material (insert)	Liquid crystal polymer (LCP)
Material (hood/housing)	Zinc die-cast
Material (contacts)	Copper alloy
Surface (contacts)	Gold plated
RoHS	compliant, compliant with exemption

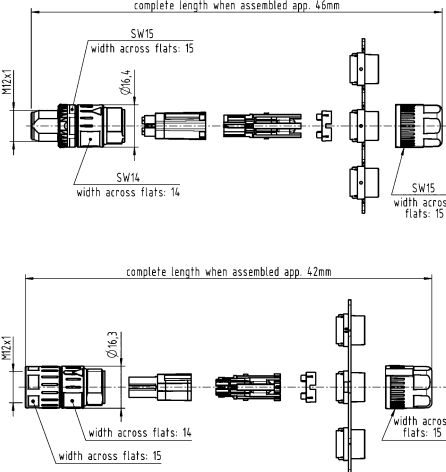
Specifications and approvals

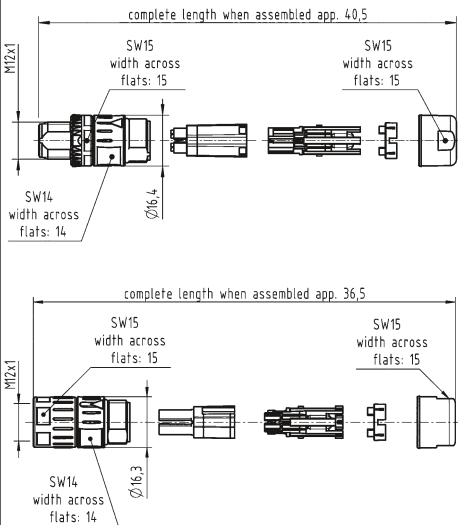
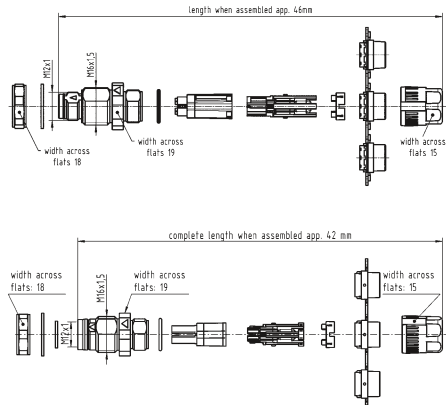
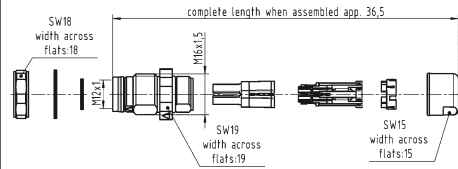
IEC 61076-2-109
UL 2238 CYJV2.E302521
CSA-C22.2 No. 182.3 CYJV8.E302521



Details

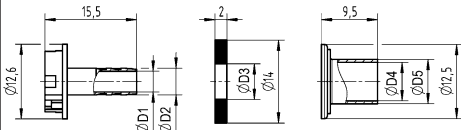
Suitable for 10 Gbit Ethernet

Identification	Conductor cross-section (mm ²)	Male	Female	Drawing	(dimensions in mm)
Circular connectors M12, M12 Slim Design, Cable connector, Straight, Crimp termination, Shielded  Please order crimp contacts separately.	0,08 ... 0,25	21 03 881 1805	21 03 881 2805		

Identification	Conductor cross-section (mm ²)	Male	Part number	Female	Drawing	(dimensions in mm)
Circular connectors M12, Slim Design Cable connector, Straight, Crimp termination, Shielded, Shield connection with crimp flange  Please order crimp contacts separately. Please order crimp flange set separately.	0,08 ... 0,25	21 03 881 1807	21 03 881 2807		 complete length when assembled app. 40,5 SW15 width across flats: 15 SW15 width across flats: 15 SW14 width across flats: 14 Ø16,4 complete length when assembled app. 36,5 SW15 width across flats: 15 SW15 width across flats: 15 SW14 width across flats: 14 Ø16,3	
Circular connectors M12, Slim Design, Cable connector, Panel feed through, for rear mounting, Crimp termination, Shielded  Please order crimp contacts separately.	0,08 ... 0,25	21 03 881 1825	21 03 881 2825		 length when assembled app. 46mm width across flats: 18 width across flats: 19 width across flats: 15 complete length when assembled app. 42 mm width across flats: 18 width across flats: 19 width across flats: 15	
Circular connectors M12, Slim Design, Cable connector, Panel feed through, for rear mounting, Crimp termination, Shielded, Shield connection with crimp flange  Please order crimp contacts separately. Please order crimp flange set separately.	0,08 ... 0,25		21 03 881 2827		 complete length when assembled app. 36,5 SW18 width across flats: 18 SW19 width across flats: 19 SW15 width across flats: 15	

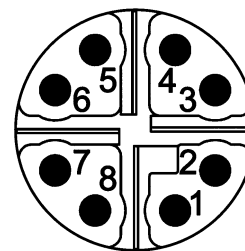
Identification	Conductor cross-section (mm ²)	Male	Part number Female	Drawing (dimensions in mm)
Circular connectors M12, Slim Design, Cable connector, Angled, Crimp termination, Shielded	0,08 ... 0,25	21 03 881 3805	21 03 881 4805	
Please order crimp contacts separately.				
Circular connectors M12,, Cable connector, Angled, Crimp termination, Shielded, Shield connection with crimp flange	0,08 ... 0,25	21 03 881 3807	21 03 881 4807	
Please order crimp contacts separately. Please order crimp flange set separately.				
har-speed, crimp contact, turned contacte	0,08 ... 0,22 0,13 ... 0,25	21 01 100 9014 21 01 100 9019	21 01 100 9023 21 01 100 9021	



Identification	Conductor cross-section (mm²)	Male	Part number	Female	Drawing	(dimensions in mm)																																														
Circular connectors M12,, Slim Design, crimp flange set  For customer specific cables HARTING will define the most suitable crimp flange set.		21 01 010 00xx	21 01 010 00xx	 <table><tr><td></td><td>D1</td><td>D2</td><td>D3</td><td>D4</td><td>D5</td></tr><tr><td>21 01 010 0017</td><td>3.5</td><td>4.5</td><td>6.0</td><td>6.5</td><td>7.5</td></tr><tr><td>21 01 010 0018</td><td>4.5</td><td>5.5</td><td>6.6</td><td>7.5</td><td>8.5</td></tr><tr><td>21 01 010 0019</td><td>4.5</td><td>5.5</td><td>6.8</td><td>8.0</td><td>9.0</td></tr><tr><td>21 01 010 0020</td><td>5.0</td><td>6.0</td><td>7.8</td><td>9.0</td><td>10.0</td></tr><tr><td>21 01 010 0021</td><td>6.5</td><td>7.5</td><td>8.0</td><td>10.0</td><td>10.8</td></tr><tr><td>21 01 010 0022</td><td>5.0</td><td>6.0</td><td>7.4</td><td>9.0</td><td>10.0</td></tr><tr><td>21 01 010 0024</td><td>5.5</td><td>6.5</td><td>8.8</td><td>10.0</td><td>10.8</td></tr></table>		D1	D2	D3	D4	D5	21 01 010 0017	3.5	4.5	6.0	6.5	7.5	21 01 010 0018	4.5	5.5	6.6	7.5	8.5	21 01 010 0019	4.5	5.5	6.8	8.0	9.0	21 01 010 0020	5.0	6.0	7.8	9.0	10.0	21 01 010 0021	6.5	7.5	8.0	10.0	10.8	21 01 010 0022	5.0	6.0	7.4	9.0	10.0	21 01 010 0024	5.5	6.5	8.8	10.0	10.8
	D1	D2	D3	D4	D5																																															
21 01 010 0017	3.5	4.5	6.0	6.5	7.5																																															
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21 01 010 0022	5.0	6.0	7.4	9.0	10.0																																															
21 01 010 0024	5.5	6.5	8.8	10.0	10.8																																															

Number of contacts

8

Crimp termination
Shielded

Technical characteristics

Number of contacts	8
Rated current	0.5 A
Rated voltage	48 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Mating cycles	≥ 500
Wire outer diameter	≤ 1.4 mm
Locking type	PushPull
Degree of protection acc. to IEC 60529	IP65 / IP67, when mated
Conductor cross-section	0.08 ... 0.25 mm ² , 0.13 ... 0.25 mm ² , 0.08 ... 0.22 mm ²
Conductor cross-section	AWG 28 ... AWG 23, AWG 26 ... AWG 23, AWG 28 ... AWG 24

Technical characteristics

Cable diameter	5.7 ... 8.8 mm
Transmission characteristics	Cat. 6A, Class EA up to 500 MHz
Material (insert)	Liquid crystal polymer (LCP)
Material (hood/housing)	Zinc die-cast
Material (contacts)	Copper alloy
Surface (contacts)	Gold plated
RoHS	compliant with exemption

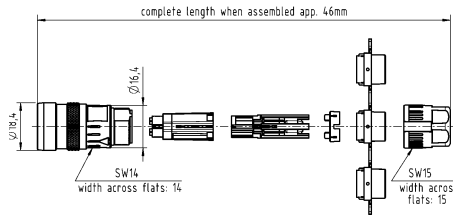
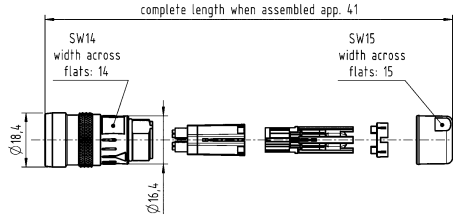
Specifications and approvals

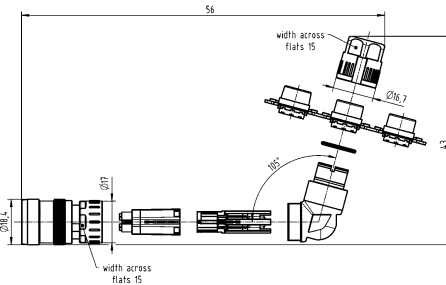
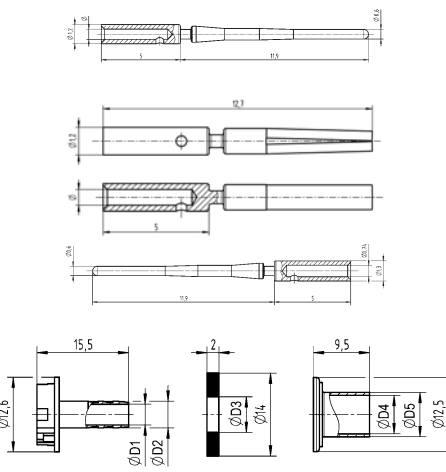
IEC 61076-2-109
UL 2238 CYJV2.E302521
CSA-C22.2 No. 182.3 CYJV8.E302521



Details

Suitable for 10 Gbit Ethernet

Identification	Conductor cross-section (mm ²)	Part number Male	Part number Female	Drawing (dimensions in mm)
Circular connectors M12, PushPull, Cable connector, Straight, Crimp termination, Shielded 	0.08 ... 0.25	21 03 881 1830		
Circular connectors M12, PushPull, Cable connector, Straight, Crimp termination, Shielded, Shield connection with crimp flange 	0.08 ... 0.25	21 03 881 1833		

Identification	Conductor cross-section (mm²)	Part number		Drawing	(dimensions in mm)																																																
Male		Female																																																			
Circular connectors M12, PushPull, Cable connector, Angled, Crimp termination, Shielded  Please order crimp contacts separately.	0.08 ... 0.25	21 03 881 3830																																																			
Circular connectors M12 PushPull, Cable connector, Angled, Crimp termination, Shielded, Shield connection with crimp flange  Please order crimp contacts separately. Please order crimp flange set separately.	0.08 ... 0.25	21 03 881 3833																																																			
har-speed, crimp contact, turned contacte Circular connectors M12, Slim Design, Crimp flange set  For customer specific cables HARTING will define the most suitable crimp flange set.	0.08 ... 0.22 0.13 ... 0.25	21 01 100 9014 21 01 100 9019 21 01 010 00xx	21 01 100 9023 21 01 100 9021 21 01 010 00xx		<table><tr><th></th><th>D1</th><th>D2</th><th>D3</th><th>D4</th><th>D5</th></tr><tr><td>21 01 010 0017</td><td>3,5</td><td>4,5</td><td>6,0</td><td>6,5</td><td>7,5</td></tr><tr><td>21 01 010 0018</td><td>4,5</td><td>5,5</td><td>6,6</td><td>7,5</td><td>8,5</td></tr><tr><td>21 01 010 0019</td><td>4,5</td><td>5,5</td><td>6,8</td><td>8,0</td><td>9,0</td></tr><tr><td>21 01 010 0020</td><td>5,0</td><td>6,0</td><td>7,8</td><td>9,0</td><td>10,0</td></tr><tr><td>21 01 010 0021</td><td>6,5</td><td>7,5</td><td>8,0</td><td>10,0</td><td>10,8</td></tr><tr><td>21 01 010 0022</td><td>5,0</td><td>6,0</td><td>7,4</td><td>9,0</td><td>10,0</td></tr><tr><td>21 01 010 0024</td><td>5,5</td><td>6,5</td><td>8,8</td><td>10,0</td><td>10,8</td></tr></table>		D1	D2	D3	D4	D5	21 01 010 0017	3,5	4,5	6,0	6,5	7,5	21 01 010 0018	4,5	5,5	6,6	7,5	8,5	21 01 010 0019	4,5	5,5	6,8	8,0	9,0	21 01 010 0020	5,0	6,0	7,8	9,0	10,0	21 01 010 0021	6,5	7,5	8,0	10,0	10,8	21 01 010 0022	5,0	6,0	7,4	9,0	10,0	21 01 010 0024	5,5	6,5	8,8	10,0	10,8
	D1	D2	D3	D4	D5																																																
21 01 010 0017	3,5	4,5	6,0	6,5	7,5																																																
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21 01 010 0020	5,0	6,0	7,8	9,0	10,0																																																
21 01 010 0021	6,5	7,5	8,0	10,0	10,8																																																
21 01 010 0022	5,0	6,0	7,4	9,0	10,0																																																
21 01 010 0024	5,5	6,5	8,8	10,0	10,8																																																

Features

- Shielding bus separate from housing potential
- Suitable for the transmission of sensitive signals (e.g. bus signals)
- The four pole Han® Quintax contact is suitable for Ethernet Cat. 5e and PROFIBUS when diagonally wiring of the data pairs

Specifications / Approvals

IEC 60664-1
IEC 61984



Technical characteristics

Contacts	2
Electrical data acc. to IEC 61984	10 A 50 V 0.8 kV 3
Rated current	10 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	$\geq 10^{10}$ Ohm
Limiting temperatures	-40 °C ... 85 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate, zinc alloy
Colour (insert)	RAL 7032 (light grey)
Material (contact)	copper alloy
Material (accessories)	metal

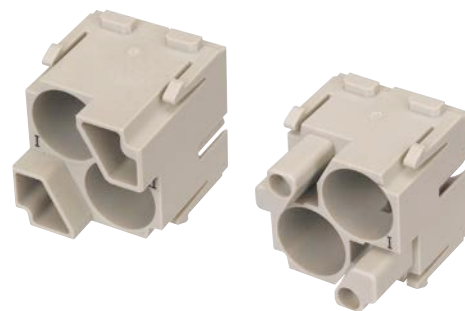
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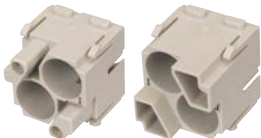
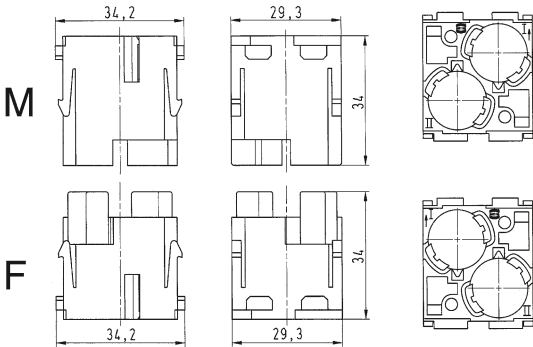
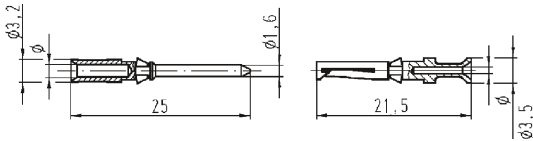
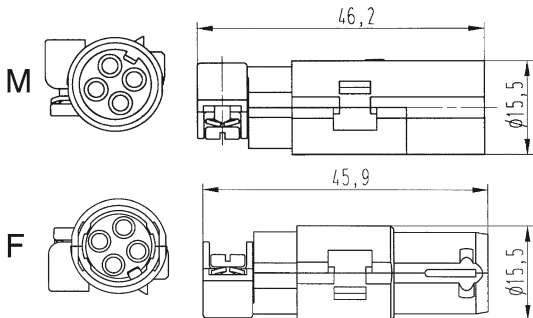
Remarks on the crimp technique

The wire gauges mentioned in the catalogue refer to geometric wire gauges of railway cords.

Number of contacts

2



Identification	Wire gauge (mm ²)	Male	Female	Drawing	Dimensions in mm																												
Han-Modular®, Han-Quintax® module Crimp terminal 		09 14 002 3001	09 14 002 3101	M F  Contact arrangement (view from termination side)																													
Han D® Crimp contact, gold plated contacts, contact resistance ≤ 3 mOhm 	0.14-0.37 0.5 0.75 1 1.5 2.5	09 15 000 6124 09 15 000 6123 09 15 000 6125 09 15 000 6122 09 15 000 6121 09 15 000 6126	09 15 000 6224 09 15 000 6223 09 15 000 6225 09 15 000 6222 09 15 000 6221 09 15 000 6226	 <table><tr><th colspan="2">Wire gauge</th><th>Ø</th><th>Stripping length</th></tr><tr><td>0.14 - 0.37 mm²</td><td>AWG 26-22</td><td>0.9 mm</td><td>8 mm</td></tr><tr><td>0.5 mm²</td><td>AWG 20</td><td>1.1 mm</td><td>8 mm</td></tr><tr><td>0.75 mm²</td><td>AWG 18</td><td>1.3 mm</td><td>8 mm</td></tr><tr><td>1 mm²</td><td>AWG 18</td><td>1.45 mm</td><td>8 mm</td></tr><tr><td>1.5 mm²</td><td>AWG 16</td><td>1.75 mm</td><td>8 mm</td></tr><tr><td>2.5 mm²</td><td>AWG 14</td><td>2.25 mm</td><td>6 mm</td></tr></table>	Wire gauge		Ø	Stripping length	0.14 - 0.37 mm ²	AWG 26-22	0.9 mm	8 mm	0.5 mm ²	AWG 20	1.1 mm	8 mm	0.75 mm ²	AWG 18	1.3 mm	8 mm	1 mm ²	AWG 18	1.45 mm	8 mm	1.5 mm ²	AWG 16	1.75 mm	8 mm	2.5 mm ²	AWG 14	2.25 mm	6 mm	
Wire gauge		Ø	Stripping length																														
0.14 - 0.37 mm ²	AWG 26-22	0.9 mm	8 mm																														
0.5 mm ²	AWG 20	1.1 mm	8 mm																														
0.75 mm ²	AWG 18	1.3 mm	8 mm																														
1 mm ²	AWG 18	1.45 mm	8 mm																														
1.5 mm ²	AWG 16	1.75 mm	8 mm																														
2.5 mm ²	AWG 14	2.25 mm	6 mm																														
Han-Quintax® contact 4 + shielding, for Han D® crimp contacts  Please order crimp contacts separately		09 15 004 3013	09 15 004 3113	M F 																													
Han-Quintax® Adapter  optional		09 14 000 9915	09 14 000 9915																														

Technical characteristics

Specifications / Approvals

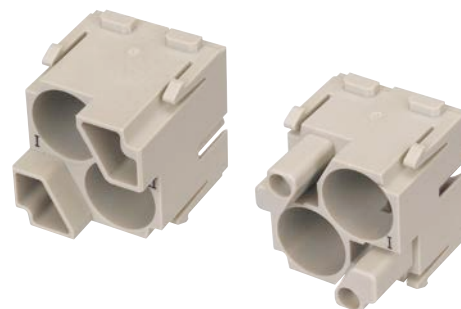
Contacts	2
Electrical data acc. to IEC 61984	5 A 50 V 0.8 kV 3
Rated current	5 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	$\geq 10^{10}$ Ohm
Limiting temperatures	-40 °C ... 85 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate
Colour (insert)	RAL 7032 (light grey)
Material (accessories)	metal

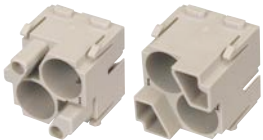
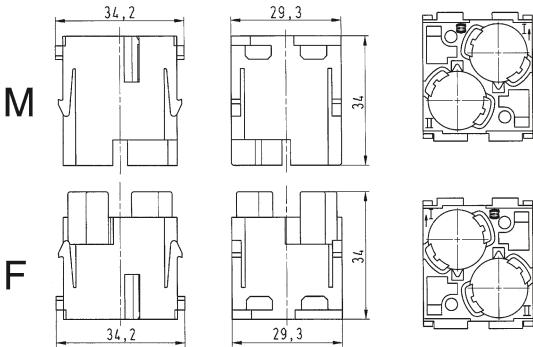
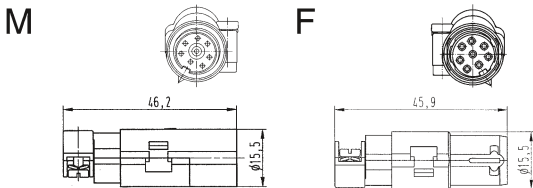
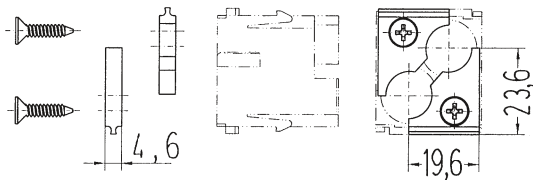
IEC 60664-1
IEC 61984



Number of contacts

2

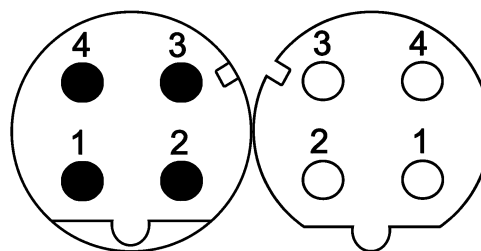


Identification	Wire gauge (mm ²)	Part number male	Part number female	Drawing	Dimensions in mm												
Han-Modular®, Han-Quintax® module Crimp terminal 		09 14 002 3001	09 14 002 3101	M F  Contact arrangement (view from termination side)													
Han-Modular®, Han-Quintax® High Density contact 8 + shielding, for Han® D-Sub contacts  Please order contacts separately		09 15 008 3013	09 15 008 3113	M F 													
Han-Quintax® Adapter  optional		09 14 000 9915	09 14 000 9915														
Han® D-Sub crimp contact, turned contacts 	0.09-0.25 0.13-0.33 0.25-0.52	09 67 000 7576 09 67 000 5576 09 67 000 8576	09 67 000 7476 09 67 000 5476 09 67 000 8476	<table><tr><th>Wire gauge</th><th>max. Insulation Ø</th><th>Stripping length</th></tr><tr><td>0.09-0.25 mm²</td><td>1.7 mm</td><td>4 mm</td></tr><tr><td>0.13-0.33 mm²</td><td>1.7 mm</td><td>4 mm</td></tr><tr><td>0.25-0.52 mm²</td><td>1.7 mm</td><td>4 mm</td></tr></table>	Wire gauge	max. Insulation Ø	Stripping length	0.09-0.25 mm ²	1.7 mm	4 mm	0.13-0.33 mm ²	1.7 mm	4 mm	0.25-0.52 mm ²	1.7 mm	4 mm	
Wire gauge	max. Insulation Ø	Stripping length															
0.09-0.25 mm ²	1.7 mm	4 mm															
0.13-0.33 mm ²	1.7 mm	4 mm															
0.25-0.52 mm ²	1.7 mm	4 mm															

Number of contacts

4

4 A 32 V 0,8 kV 3
+ shielding



Technical characteristics

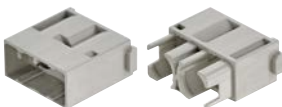
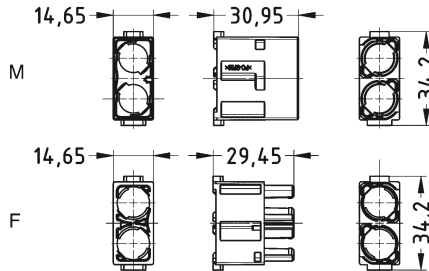
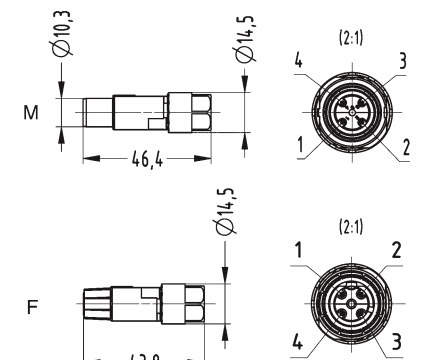
Number of contacts	4
Additional contacts	+ shielding
Rated current	4 A
Rated voltage	32 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Contact resistance, shielding	≤ 100 mΩ
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 500
Wire outer diameter	≤ 2.3 mm

Technical characteristics

Transmission characteristics Cat. 5, Class D up to 100 MHz	
Material (insert)	Liquid crystal polymer (LCP), Polycarbonate (PC)
Material (shielding)	Copper alloy, nickel plated
Colour (insert)	RAL 7032 (pebble grey)
Material (contacts)	Copper alloy
Material flammability class acc.to UL 94	V-0
RoHS	compliant with exemption

Specifications and approvals

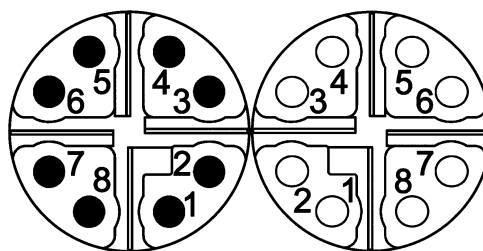
EN 60664-1
IEC 61984

Bezeichnung	Leiterquerschnitt (mm ²)	Artikelnummer Stift	Buchse	Maßzeichnung	Maße in mm
Han-Modular®, Han® M12 module 		09 14 002 3061	09 14 002 3161		
Han-Modular®, D-coding, Crimp termination  Please order crimp contacts separately.	0.13 ... 0.82	09 14 881 1405	09 14 881 2405		

Identification	Conductor cross-section (mm²)	Part number		Drawing	(dimensions in mm)																	
		Male	Female																			
D-Sub, Standard, Crimp contact 	0.13 ... 0.33	09 67 000 5576	09 67 000 5476	<table><tr><th>Conductor cross-section</th><th>Ø</th><th>Stripping length</th></tr><tr><td>0.09-0.25 mm²</td><td>0.64 mm</td><td>4 mm</td></tr><tr><td>0.13-0.33 mm²</td><td>0.88 mm</td><td>4 mm</td></tr><tr><td>0.25-0.52 mm²</td><td>1.13 mm</td><td>4 mm</td></tr><tr><td>0.33-0.82 mm²</td><td>1.34 mm</td><td>4 mm</td></tr><tr><td colspan="3">for stranded wire according IEC 60228 Class 5</td></tr></table>	Conductor cross-section	Ø	Stripping length	0.09-0.25 mm²	0.64 mm	4 mm	0.13-0.33 mm²	0.88 mm	4 mm	0.25-0.52 mm²	1.13 mm	4 mm	0.33-0.82 mm²	1.34 mm	4 mm	for stranded wire according IEC 60228 Class 5		
	Conductor cross-section	Ø	Stripping length																			
	0.09-0.25 mm²	0.64 mm	4 mm																			
	0.13-0.33 mm²	0.88 mm	4 mm																			
	0.25-0.52 mm²	1.13 mm	4 mm																			
0.33-0.82 mm²	1.34 mm	4 mm																				
for stranded wire according IEC 60228 Class 5																						
0.25 ... 0.52	09 67 000 8576	09 67 000 8476																				
0.33 ... 0.82	09 67 000 3576	09 67 000 3476																				

Number of contacts

8

0.5 A 32 V 0.8 kV 3
+ shielding

Technical characteristics

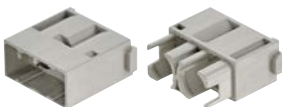
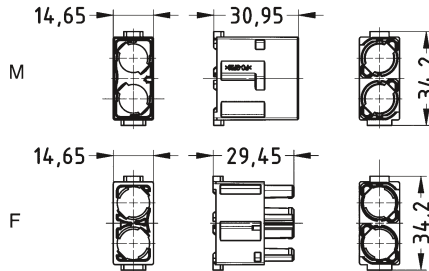
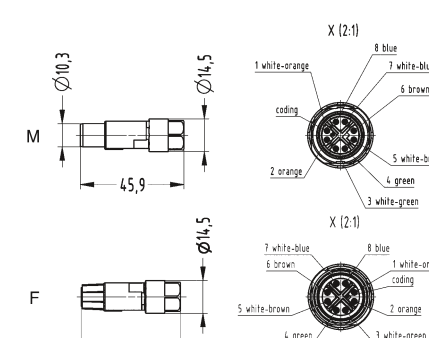
Number of contacts	8
Additional contacts	+ shielding
Rated current	0.5 A
Rated voltage	32 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	> 10 ⁸ Ω
Contact resistance	≤ 10 mΩ
Contact resistance, shielding	≤ 100 mΩ
Limiting temperature	-40 ... +85 °C
Mating cycles	≥ 500
Wire outer diameter	≤ 1.4 mm

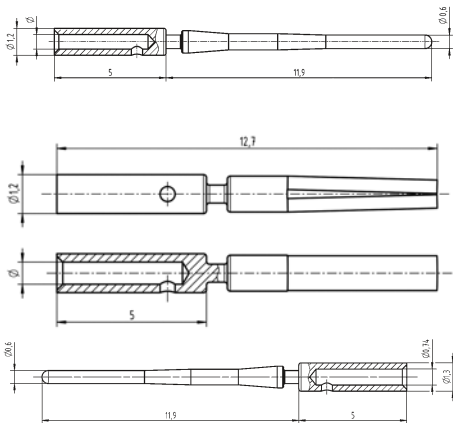
Technical characteristics

Transmission characteristics	Cat. 6 _A , Class E _A up to 500 MHz
Material (insert)	Liquid crystal polymer (LCP), Polycarbonate (PC)
Material (shielding)	Copper alloy, nickel plated
Colour (insert)	RAL 7032 (pebble grey)
Material (contacts)	Copper alloy
Material flammability class acc. to UL 94	V-0
RoHS	compliant with exemption

Specifications and approvals

EN 60664-1
IEC 61984

Identification	Conductor cross-section (mm ²)	Part number Male	Part number Female	Drawing (dimensions in mm)
Han-Modular®, Han® M12 module 		09 14 002 3061	09 14 002 3161	
Han-Modular®, X-coding, Crimp termination  Please order crimp contacts separately.	0.08 ... 0.25	09 14 881 1805	09 14 881 2805	 Cable diameter 5.7 ... 8.8 mm

Identification	Conductor cross-section (mm ²)	Part number		Drawing	(dimensions in mm)
		Male	Female		
har-speed, Crimp contact, Contact surface: Gold plated 	0.08 ... 0.22 0.13 ... 0.25	21 01 100 9014 21 01 100 9019	21 01 100 9023 21 01 100 9021		

Features

- Shielding bus separate from housing potential
- Suitable for Fast Ethernet 100 Mbit/s (1 x 4) or Gigabit Ethernet 1000 Mbit/s (2 x 4) Cat. 5e. By the connection of two 4-wire EtherRail® railway cords (4 x AWG 22/19 resp. 4 x AWG 22/7) the transmission of Gigabit Ethernet is possible.
- Suitable for Han® B, Han® M, Han® EMC and Han® HPR hoods/housings, high construction

Specifications / Approvals

DIN EN 60664-1
DIN EN 61984



Technical characteristics

Contacts	2
Electrical data acc. to IEC 61984	10 A 50 V 0.8 kV 3
Rated current	10 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	≥ 10 ¹⁰ Ohm
Limiting temperatures	-40 °C ... 125 °C -40 °C ... 85 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate
Colour (insert)	RAL 7032 (light grey)
Material (contact)	copper alloy
Material (shielding element)	zinc die-cast alloy
Material (outer conductor)	zinc alloy
Surface (outer conductor)	nickel plated contacts

Details

Remarks on the crimp technique

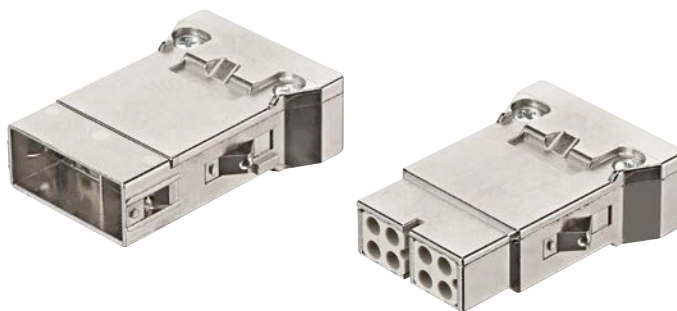
The wire gauges mentioned in the catalogue refer to geometric wire gauges of railway cords.

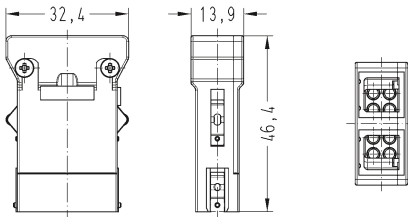
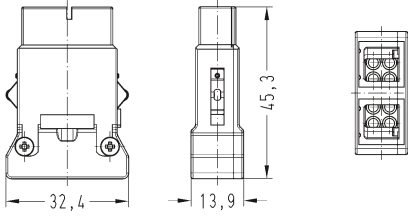
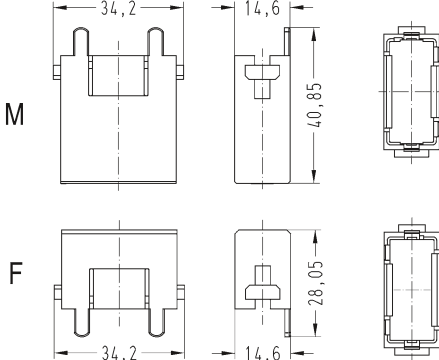
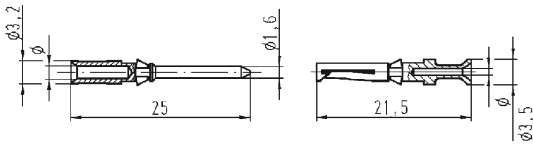
Number of contacts

2 x 4

50 V

10 A



Identification	Wire gauge (mm ²)	Part number male	Part number female	Drawing	Dimensions in mm																					
Han-Modular®, Han® Megabit Insert Crimp terminal Please order crimp contacts separately Please order the adapter module separately 		09 14 008 3016	09 14 008 3116																							
Han-Modular®, Han® Megabit Insert Crimp terminal, with additional shield connection to the hinged frame Please order crimp contacts separately Please order the adapter module separately 		09 14 008 3017	09 14 008 3117																							
Han-Modular®, Adapter module 		09 14 001 3011	09 14 001 3111																							
Han D® Crimp contact, gold plated contacts, contact resistance ≤ 3 mOhm 	0.14-0.37 0.5 0.75 1 1.5 2.5	09 15 000 6124 09 15 000 6123 09 15 000 6125 09 15 000 6122 09 15 000 6121 09 15 000 6126	09 15 000 6224 09 15 000 6223 09 15 000 6225 09 15 000 6222 09 15 000 6221 09 15 000 6226		<table><tr><th>Wire gauge</th><th>Ø</th><th>Stripping length</th></tr><tr><td>0.14 - 0.37 mm²</td><td>0.9 mm</td><td>8 mm</td></tr><tr><td>0.5 mm²</td><td>1.1 mm</td><td>8 mm</td></tr><tr><td>0.75 mm²</td><td>1.3 mm</td><td>8 mm</td></tr><tr><td>1 mm²</td><td>1.45 mm</td><td>8 mm</td></tr><tr><td>1.5 mm²</td><td>1.75 mm</td><td>8 mm</td></tr><tr><td>2.5 mm²</td><td>2.25 mm</td><td>6 mm</td></tr></table>	Wire gauge	Ø	Stripping length	0.14 - 0.37 mm ²	0.9 mm	8 mm	0.5 mm ²	1.1 mm	8 mm	0.75 mm ²	1.3 mm	8 mm	1 mm ²	1.45 mm	8 mm	1.5 mm ²	1.75 mm	8 mm	2.5 mm ²	2.25 mm	6 mm
Wire gauge	Ø	Stripping length																								
0.14 - 0.37 mm ²	0.9 mm	8 mm																								
0.5 mm ²	1.1 mm	8 mm																								
0.75 mm ²	1.3 mm	8 mm																								
1 mm ²	1.45 mm	8 mm																								
1.5 mm ²	1.75 mm	8 mm																								
2.5 mm ²	2.25 mm	6 mm																								



Features

- Shielding bus separate from housing potential
- Suitable for the transmission of sensitive signals (e.g. bus signals)
- Usable for Gigabit Ethernet Cat. 6_A

Specifications / Approvals

IEC 60664-1
IEC 61984



Technical characteristics

Contacts	8
Electrical data acc. to IEC 61984	5 A 50 V 0.8 kV 3
Rated current	5 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	≥ 10 ¹⁰ Ohm
Limiting temperatures	-40 °C ... 85 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate
Colour (insert)	RAL 7032 (light grey)
Material (shielding element)	zinc die-cast alloy
Material (outer conductor)	zinc alloy
Surface (outer conductor)	nickel plated contacts

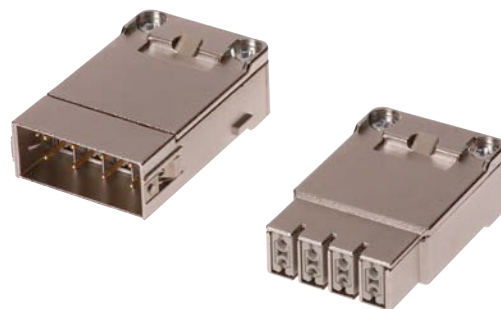
Number of contacts

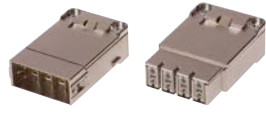
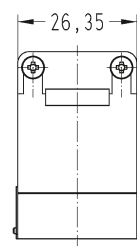
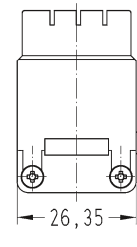
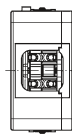
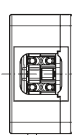
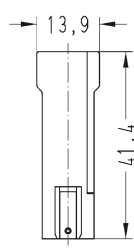
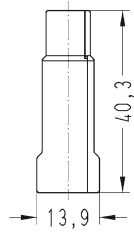
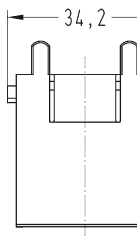
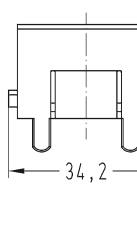
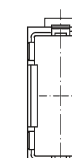
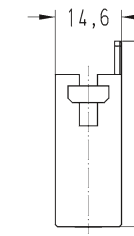
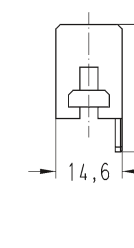
8

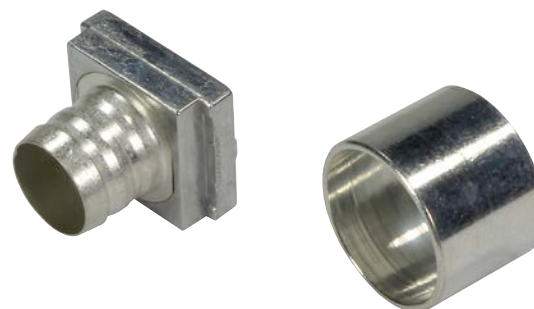
50 V

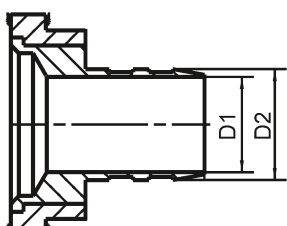
5 A

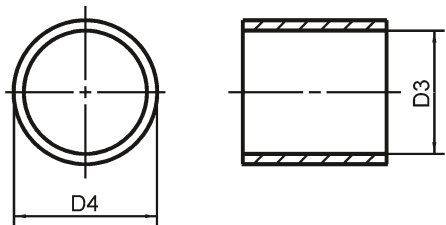
+ shielding



Identification	Wire gauge (mm ²)	Part number male	Part number female	Drawing	Dimensions in mm												
Han-Modular®, Han® Gigabit Insert Crimp terminal Please order crimp contacts separately Please order the adapter module separately 		09 14 008 3011	09 14 008 3111	M  F  Contact arrangement (view from termination side)  	 												
Han-Modular®, Adapter module 		09 14 001 3011	09 14 001 3111	M  F   	 												
Han® D-Sub crimp contact, turned contacts 	0.09-0.25 0.13-0.33 0.25-0.52	09 67 000 7576 09 67 000 5576 09 67 000 8576	09 67 000 7476 09 67 000 5476 09 67 000 8476	<table><tr><th>Wire gauge</th><th>max. Insulation Ø</th><th>Stripping length</th></tr><tr><td>0.09-0.25 mm²</td><td>1.7 mm</td><td>4 mm</td></tr><tr><td>0.13-0.33 mm²</td><td>1.7 mm</td><td>4 mm</td></tr><tr><td>0.25-0.52 mm²</td><td>1.7 mm</td><td>4 mm</td></tr></table>	Wire gauge	max. Insulation Ø	Stripping length	0.09-0.25 mm ²	1.7 mm	4 mm	0.13-0.33 mm ²	1.7 mm	4 mm	0.25-0.52 mm ²	1.7 mm	4 mm	
Wire gauge	max. Insulation Ø	Stripping length															
0.09-0.25 mm ²	1.7 mm	4 mm															
0.13-0.33 mm ²	1.7 mm	4 mm															
0.25-0.52 mm ²	1.7 mm	4 mm															



Identification	D1	D2	Part number	Drawing	Dimensions in mm
Crimp flange  HARTING offers to test and define the best crimp flange and ferrule combination for customer-specific railway cords.	3 mm	4 mm	61 03 000 0062		
	4 mm	5 mm	61 03 000 0064		
	5 mm	6 mm	61 03 000 0066		
	6 mm	7 mm	61 03 000 0067		
	7 mm	8 mm	61 03 000 0069		
	8 mm	9 mm	61 03 000 0071		
	9 mm	10 mm	61 03 000 0072		
	3.5 mm	4 mm	61 03 000 0063		
	4.5 mm	5.5 mm	61 03 000 0065		
	5.5 mm	6.5 mm	61 03 000 0166		
	6.5 mm	7.5 mm	61 03 000 0068		
	7.5 mm	8.5 mm	61 03 000 0070		
	18.5 mm	19.5 mm	61 03 000 0165		

Identification	D3	D4	Part number	Drawing	Dimensions in mm
Crimp ferrule  HARTING offers to test and define the best crimp flange and ferrule combination for customer-specific railway cords.	5 mm	6 mm	61 03 000 0045		
	6 mm	7 mm	61 03 000 0047		
	7 mm	8 mm	61 03 000 0049		
	8 mm	9 mm	61 03 000 0051		
	9 mm	10 mm	61 03 000 0053		
	10 mm	11 mm	61 03 000 0055		
	11 mm	12 mm	61 03 000 0057		
	12 mm	13 mm	61 03 000 0142		
	13 mm	14 mm	61 03 000 0127		
	5.5 mm	6.5 mm	61 03 000 0046		
	6.5 mm	7.5 mm	61 03 000 0048		
	7.5 mm	8.5 mm	61 03 000 0050		
	8.5 mm	9.5 mm	61 03 000 0052		
	9.5 mm	10.5 mm	61 03 000 0054		
	10.5 mm	11.5 mm	61 03 000 0056		
	11.5 mm	12.5 mm	61 03 000 0058		
	12.5 mm	13.5 mm	61 03 000 0059		

Cable clamp
5 ... 7 mm



Cable clamp
7 ... 10 mm



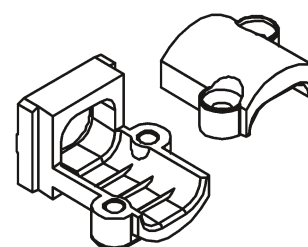
Cable clamp
10 ... 12 mm



61 03 000 0141

61 03 000 0044

61 03 000 0143



Notes

This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin, light gray lines. There are no margins, text, or other markings on the page.



Ha-VIS data bus cable
2-wire, elastic

Advantages

- Halogen free
- Electron-beam cross-linked cable
- Improved fire performance
- High resistance to temperature
- Conform to MVB standard according IEC 61375-3-1

Applications

For fixed and moveable installation inside of rail vehicles and buses. For symmetrical signal and data transmission with impedance of 120 Ohm. Suitable for use in MVB (Multifunction Vehicle Bus) as part of the TCN (Train Communication Network). Especially designed for termination with HARTING D-Sub InduCom and Han-Quintax® and other railway-specific Han® connectors and housings.

Features

- | | |
|-------------------------|---|
| • Sheath material | Elastomer,
electron beam cross-linked |
| • Category | MVB bus 120 Ω |
| • Number of wires | 2 and more pairs |
| • Wire design | 2 x 0.5 mm ² or higher number of pairs
on request |
| • Cable sheath diameter | 7.9 mm |

Ha-VIS data bus cable 2-wire, elastic



Identification

Part No.

Ha-VIS data bus cable 2-wire, elastic

Sheath material:

Elastomer, electron-beam cross-linked,
COMP 603

Colour: black

Nominal voltage: 300 V

Testing voltage:

Conductor/conductor 2 kV AC

Conductor/shielding 2 kV AC

Maximum conductor

resistance @ 20 °C: < 40.1 mΩ/m

Impedance @

0.75 – 3 MHz: 120 Ω ± 12 Ω

Transfer impedance

@ 20 MHz: ≤ 20 mΩ/m

Attenuation:

1 MHz: ≤ 12 dB/km

3 MHz: ≤ 17 dB/km

4 MHz: ≤ 22 dB/km

Maximum conductor temperature:

Fixed installed -40 °C ... +90 °C

Short circuit +160 °C

Minimum bending radius:

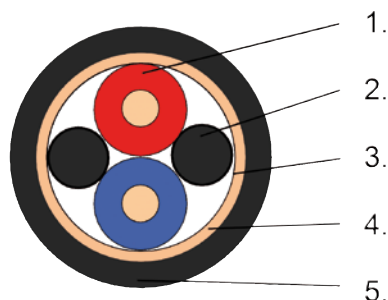
Fixed installed > 6 x diameter

Cable sheath diameter: (Ø 7.9 ± 0.2) mm

Cable weight: 85 kg/km

500 m drum

09 45 600 0270



1. Pair

Conductor: tinned copper strands 0.5 mm² according to VDE 0295/IEC 60228 Class 5 construction 16 x 0.20 mm, Ø 0.85 mm

Insulation: Polyethylene (PE), cross-linked, Comp 655 Ø 2.85 mm

Colours: red, blue

2. Filler

3. Wrapping

Plastic tape

4. Shielding

Aluminium-bonded polyester tape with tinned fine copper braid, Ø 6.5 mm

5. Jacket

Elastomer electron-beam cross-linked Comp 603, Ø 7.9 mm

Colour: black

Ha-VIS data bus cable
2-wire, elastic



Advantages

- Halogen free
- Electron-beam cross-linked cable
- Improved fire performance
- High resistance to temperature
- Conform to UIC 558 standard
- Conform to WTB standard according IEC 61 375-2-1

Applications

For fixed and moveable installation inside of rail vehicles and buses. For symmetrical signal and data transmission with impedance of 120 Ohm. Suitable for use in WTB (Wire Train Bus) as part of the TCN (Train Communication Network) according UIC 558. Especially designed for termination with HARTING D-Sub InduCom and Han-Quintax® and other railway- specific Han® connectors and housings.

Features

- | | |
|-------------------------|--|
| • Sheath material | Elastomer,
electron beam cross-linked |
| • Category | WTB bus 120 Ω |
| • Number of wires | 2 and more pairs |
| • Wire design | 2 x 0.75 mm ² or higher number
of pairs on request |
| • Cable sheath diameter | 9.6 mm |

Ha-VIS data bus cable

2-wire, elastic



Identification

Part No.

Ha-VIS data bus cable

2-wire, elastic

Sheath material:

Elastomer, electron-beam cross-linked,
COMP 603

Colour: black

Nominal voltage: 300 V

Testing voltage:

Conductor/conductor 2 kV AC

Conductor/shielding 2 kV AC

Maximum conductor

resistance @ 20 °C: < 26.7 mΩ/m

Capacitance @ 1 MHz:

Railway cord/railway cord: < 65 pF/m

Railway cord/screen: < 120 pF/m

Impedance @

0.75 – 3 MHz: 120 Ω ± 12 Ω

Transfer impedance

@ 30 MHz: ≤ 30 mΩ/m

Attenuation:

1 MHz: ≤ 10 dB/km

4 MHz: ≤ 14 dB/km

5 MHz: ≤ 18 dB/km

Maximum conductor temperature:

Fixed installed -40 °C ... +90 °C

Short circuit +160 °C

Minimum bending radius:

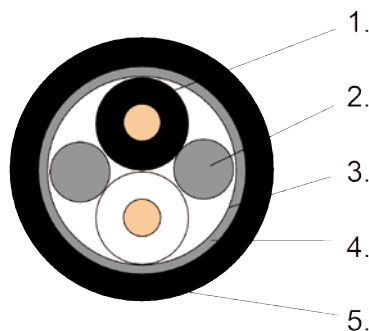
Fixed installed > 6 x diameter

Cable sheath diameter: (Ø 9.6 ± 0.2) mm

Cable weight: 114 kg/km

500 m drum

09 45 600 0280



1. Pair

Conductor: tinned copper strands 0.75 mm² according to VDE 0295/IEC 60228 Class 5 construction 24 x 0.20 mm, Ø 1.1 mm

Insulation: Polyethylene (PE), cross-linked, Comp 655 Ø 3.7 mm

Colours: black, white

2. Filler

Polyolefine copolymer

3. Wrapping

Plastic tape

4. Shielding

Aluminium-bonded polyester tape with tinned fine copper braid, Ø 8.2 mm

5. Jacket

Elastomer electron-beam cross-linked Comp 603, Ø 9.6 mm

Colour: black

Ha-VIS data bus cable
2-wire, elastic, FOAM



Advantages

Applications

- Halogen free
- Electron-beam cross-linked cable
- Improved fire performance
- High resistance to temperature
- Conform to UIC 558 standard
- Conform to WTB standard according IEC 61 375-2-1

For fixed and moveable installation inside of rail vehicles and buses. For symmetrical signal and data transmission with impedance of 120 Ohm. Suitable for use in WTB (Wire Train Bus) as part of the TCN (Train Communication Network) according UIC 558.
Especially designed for termination with HARTING D-Sub InduCom and Han-Quintax® and other railway- specific Han® connectors and housings.

Features

- | | |
|-------------------------|--|
| • Sheath material | Elastomer,
electron beam cross-linked |
| • Category | WTB bus 120 ? |
| • Number of wires | 2 and more pairs |
| • Wire design | 2 x 0.75 mm ² or higher number of
pairs after request, FOAM insulation |
| • Cable sheath diameter | 8 mm |

Ha-VIS data bus cable 2-wire, elastic, FOAM



Identification

Part No.

Ha-VIS data bus cable 2-wire, elastic, FOAM

Sheath material:

Elastomer, electron-beam cross-linked,
COMP 603

Colour: black

Nominal voltage: 300 V

Testing voltage:

Conductor/conductor 1.5 kV AC

Conductor/shielding 1.5 kV AC

Maximum conductor

resistance @ 20 °C: < 26.7 mΩ/m

Capacitance @ 1 MHz:

Railway cord/railway cord: < 65 pF/m

Railway cord/screen: < 120 pF/m

Impedance @

0.75 – 3 MHz: 120 Ω ± 12 Ω

Transfer impedance

@ 30 MHz: ≤ 30 mΩ/m

Attenuation:

1 MHz: ≤ 10 dB/km

2 MHz: ≤ 14 dB/km

Maximum conductor temperature:

Fixed installed -25 °C ... +90 °C

Short circuit +100 °C

Minimum bending radius:

Fixed installed > 6 x diameter

Cable sheath diameter: (Ø 8.0 ± 0.2) mm

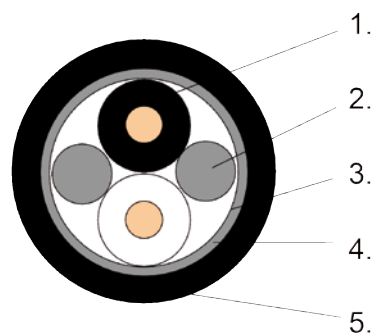
Cable weight: 79 kg/km

500 m drum

1000 m drum

09 45 600 0181

09 45 600 0191



1. Pair

Conductor: tinned copper strands according to VDE 0295/IEC 60228 Class 5 construction 19 x 0.20 mm, Ø 1.1 mm

Insulation: FOAM-skin polyolefin, Ø 2.7 mm

Colours: black, white

2. Filler

Polyolefine copolymer

3. Wrapping

Plastic tape

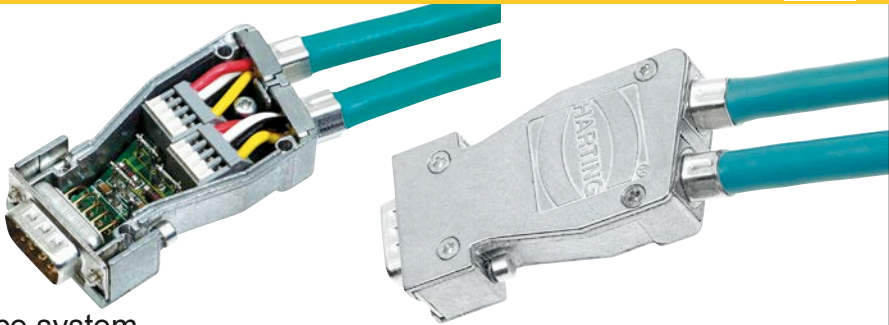
4. Shielding

Tinned fine copper braid, Ø 6.4 mm

5. Jacket

Elastomer electron-beam cross-linked Comp 603, Ø 8.0 mm

Colour: black



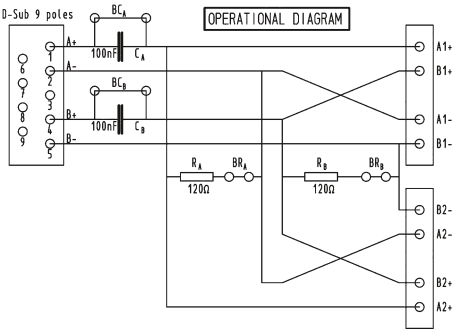
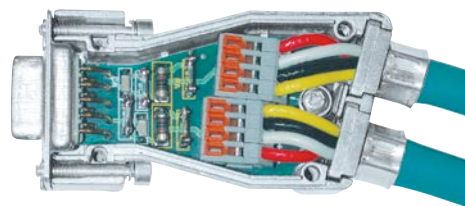
InduCom 9 – Industrial bus interface system

Identification

Part number

General information

MVB Interface



66 63 009 5013

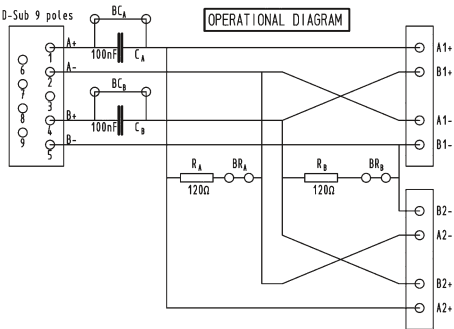
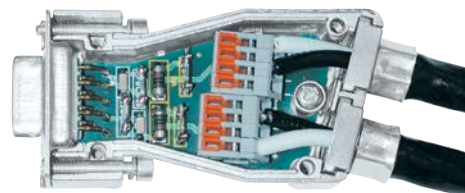
MVB backbone interface set

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.*

Components of the MVB interface set:

- 1 metal housing with 2 cable entries
- 2 hexagonal screws with UNC 4-40 threads
- 1 PCB with 9 way D-Sub male connector and cage clamps
- 2 crimp flanges for the MVB cable
- 2 crimp ferrules for the MVB cable
- 1 blanking piece

WTB Interface



66 63 009 5014

WTB backbone interface set

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.*

Components of the MVB interface set:

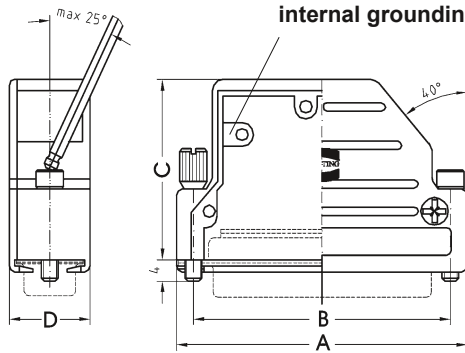
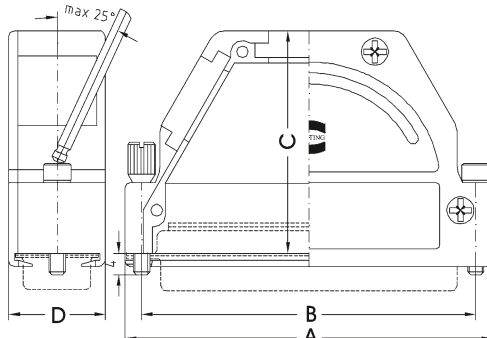
- 1 metal housing with 2 cable entries
- 2 hexagonal screws with UNC 4-40 threads
- 1 PCB with 9 way D-Sub male connector and cage clamps
- 2 crimp flanges for the WTB cable
- 2 crimp ferrules for the WTB cable
- 1 blanking piece

Further bus PCBs on request

* To check compatibility with cable types and manufacturers, please contact your local HARTING representative.



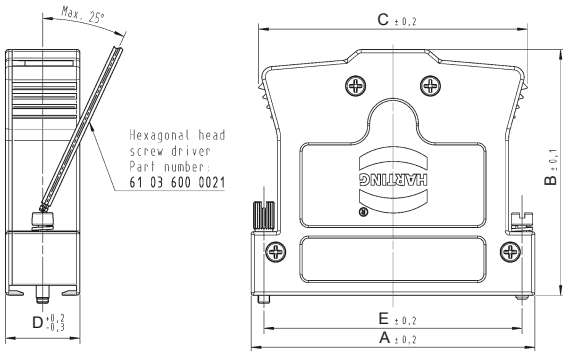
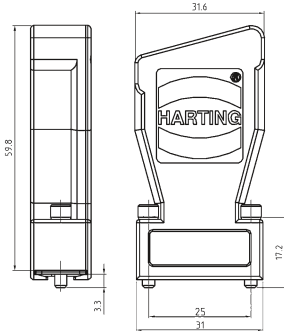
Full metal top and side entry hoods
with different screw options

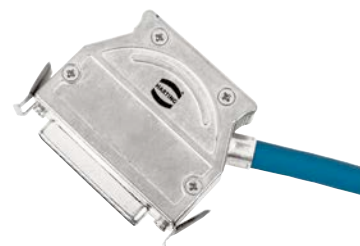
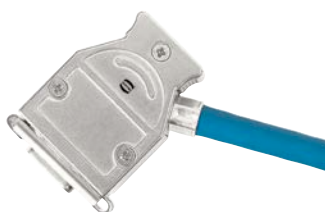
Identification	No. of contacts	Part number	Drawing	Dimensions in mm																																				
40° side entry hood with internal grounding block	9	61 03 001 . 013		<table><tr><th>No. of contacts</th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>9</td><td>31.0</td><td>25.0</td><td>35.0</td><td>15.0</td></tr><tr><td>15</td><td>39.3</td><td>33.3</td><td>35.0</td><td>15.0</td></tr><tr><td>25</td><td>53.0</td><td>47.0</td><td>35.0</td><td>15.0</td></tr></table>	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	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																																				
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		<table><tr><th>No. of contacts</th><th>No. of cable entries</th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>9</td><td>1 (top)</td><td>31.0</td><td>25.0</td><td>38.0</td><td>15.0</td></tr><tr><td>15</td><td>1 (top)</td><td>39.5</td><td>33.3</td><td>35.0</td><td>15.0</td></tr><tr><td>25</td><td>3</td><td>53.0</td><td>47.0</td><td>43.0</td><td>15.0</td></tr><tr><td>37</td><td>3</td><td>69.5</td><td>63.5</td><td>43.0</td><td>15.0</td></tr><tr><td>50</td><td>3</td><td>67.2</td><td>61.6</td><td>43.0</td><td>17.8</td></tr></table>	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
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																																			
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																																							

¹⁾ Part number contains two blanking pieces
Operating temperature for all hoods on this page: -20 °C ... +90 °C



Full metal top and side entry hoods
with different screw options

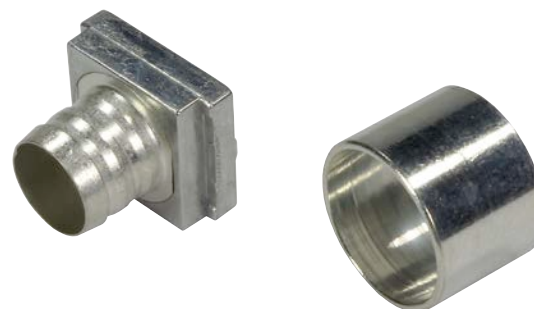
Identification	No. of contacts	Part number	Drawing	Dimensions in mm																		
5° top entry hood with 3 cable entries																						
with internal grounding block	37 50	61 03 001 . 118 61 03 001 . 119	 <table><thead><tr><th>No. of contacts</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th></tr></thead><tbody><tr><td>37</td><td>69.5</td><td>52.0</td><td>58.2</td><td>14.8</td><td>63.5</td></tr><tr><td>50</td><td>67.1</td><td>58.0</td><td>63.6</td><td>17.6</td><td>61.1</td></tr></tbody></table>	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	
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																	
without internal grounding block	37 50	61 03 001 . 118 010 61 03 001 . 119 010																				
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																					
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																						

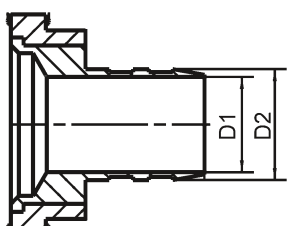


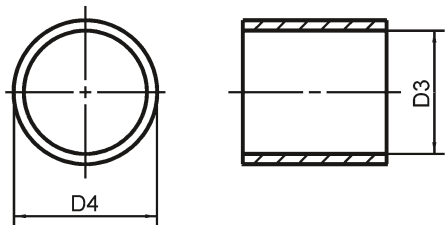
Full metal top and side entry hoods for spring or slide locking

Identification	No. of contacts	Part number	Drawing	Dimensions in mm																																				
Top/side entry hood with spring/ slide locking	9	61 03 001 0022 ¹⁾	<table><tr><th>No. of contacts</th><th>No. of cable entries</th><th>A</th><th>B</th><th>C</th><th>D</th></tr><tr><td>9</td><td>2</td><td>31.0</td><td>22.6</td><td>40.0</td><td>14.8</td></tr><tr><td>15</td><td>3</td><td>39.0</td><td>30.6</td><td>40.0</td><td>14.8</td></tr><tr><td>25</td><td>3</td><td>53.0</td><td>42.6</td><td>40.0</td><td>14.8</td></tr><tr><td>37</td><td>3</td><td>69.5</td><td>59.2</td><td>40.0</td><td>14.8</td></tr><tr><td>50</td><td>3</td><td>67.0</td><td>55.0</td><td>40.0</td><td>17.6</td></tr></table>	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	
	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																																			
15	61 03 001 0011 ²⁾																																							
25	61 03 001 0012 ²⁾																																							
37	61 03 001 0021 ²⁾																																							
50	61 03 001 0020 ²⁾																																							

¹⁾ Part number contains one blanking piece
²⁾ Part number contains two blanking pieces



Identification	D1	D2	Part number	Drawing	Dimensions in mm
Crimp flange  HARTING offers to test and define the best crimp flange and ferrule combination for customer-specific railway cords.	3 mm	4 mm	61 03 000 0062		
	4 mm	5 mm	61 03 000 0064		
	5 mm	6 mm	61 03 000 0066		
	6 mm	7 mm	61 03 000 0067		
	7 mm	8 mm	61 03 000 0069		
	8 mm	9 mm	61 03 000 0071		
	9 mm	10 mm	61 03 000 0072		
	3.5 mm	4 mm	61 03 000 0063		
	4.5 mm	5.5 mm	61 03 000 0065		
	5.5 mm	6.5 mm	61 03 000 0166		
	6.5 mm	7.5 mm	61 03 000 0068		
	7.5 mm	8.5 mm	61 03 000 0070		
	18.5 mm	19.5 mm	61 03 000 0165		

Identification	D3	D4	Part number	Drawing	Dimensions in mm
Crimp ferrule  HARTING offers to test and define the best crimp flange and ferrule combination for customer-specific railway cords.	5 mm	6 mm	61 03 000 0045		
	6 mm	7 mm	61 03 000 0047		
	7 mm	8 mm	61 03 000 0049		
	8 mm	9 mm	61 03 000 0051		
	9 mm	10 mm	61 03 000 0053		
	10 mm	11 mm	61 03 000 0055		
	11 mm	12 mm	61 03 000 0057		
	12 mm	13 mm	61 03 000 0142		
	13 mm	14 mm	61 03 000 0127		
	5.5 mm	6.5 mm	61 03 000 0046		
	6.5 mm	7.5 mm	61 03 000 0048		
	7.5 mm	8.5 mm	61 03 000 0050		
	8.5 mm	9.5 mm	61 03 000 0052		
	9.5 mm	10.5 mm	61 03 000 0054		
	10.5 mm	11.5 mm	61 03 000 0056		
	11.5 mm	12.5 mm	61 03 000 0058		
	12.5 mm	13.5 mm	61 03 000 0059		

Cable clamp
5 ... 7 mm



61 03 000 0141

Cable clamp
7 ... 10 mm

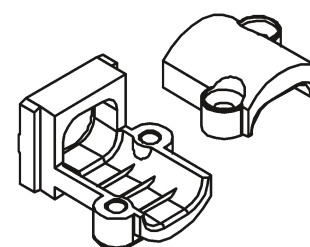


61 03 000 0044

Cable clamp
10 ... 12 mm



61 03 000 0143



Directory Chapter 06

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In addition to classic copper cabling, HARTING offers a wide range of fibre optic (FO) cabling components and systems.

FO encompasses three types of cables:

- Multi-mode fibre optic cables and components
- Single-mode fibre optic cables and components
- Polymer optical fibres and components (POF)

While fibre optics can bridge very long distances (up to several kilometres), POF is often used for facilities and machinery construction applications which have an action radius of 50 metres.

POF components are also very quick and easy to assemble in the field, whereas glass fibre optic products often require expertise, care and special tools (splicers, special adhesive and grinding equipment, etc.).

The portfolio shown here includes:

- Fibre optic assemblies with LC, SC and ST connectors (IP20)
- Fibre optic assemblies with LC duplex connectors in HARTING PushPull V4 (IP65 / IP67)
- Fibre optic assemblies with LC duplex connectors in Han® 3 A (IP65 / IP67 / IP68)

- Hybrid cables and connectors in Han® 3 A (IP65 / IP67) with 2 x GF and 3 x 2.5 mm² copper each

- POF SCRJ system cables in IP20 and in Han® PushPull V14 in IP65 / IP67; PROFINET compliant

- PushPull XS SFP components

Fibre optic cables are much more sensitive overall than copper wires during their assembly, testing, routing (bending, torsion, tensile stress) and in operation (pressure sensitivity and temperature fluctuations).

They do, however, offer advantages in regards to their bandwidth/transfer rate, bridging distances (not limited to 100 m), and EMC behaviour (no shielding or grounding necessary).

This catalogue should not be used to find the optimal solution for a particular application. Recommendations can only be made.

HARTING HCS (<http://www.harting-customised-solutions.com/en/home/>) provides more help in developing customised solutions in the railway sector.

General

Apart from applications in the field of telecommunications, fibre optic technology is of great importance in the industrial market sector. In telecommunications there are requirements for:

- High transmission capacity
- Low cable attenuation
- No crosstalk

These features are also required in the industrial sector along with the following major considerations:

- Zero susceptibility to electromagnetic interference
- Electrical insulation between transmitter and receiver
- Small cable diameter

Fibre optic communication works by pulses of light. When feeding them in at one end of the fibre optic cable, the pulses are passed to the other end by total internal reflection.

Total internal reflection occurs at the boundary layer between core and cladding by virtue of the different values of optical refractive index (n) between the two materials (n_{cladding} less than n_{core}).

There are three different types of optical fibres:

		Typical Dimensions Core/ Cladding Ø	Attenuation
Step index (SI) fibre HCS ^{® 1)} /POF ²⁾		200/230 µm	5 dB/km ... 8 dB/km 0.2 dB/km
Gradient index(GI) fibre		50 /125 µm	2.6 dB/km 3.2 dB/km
Single modem fibre		9/ 125 µm	< 0.3 dB/km

The single modem fibre is mainly used in telecommunications because of its low attenuation and wide band-width.

The gradient index fibre and the step fibre with their large core diameters are chiefly used as communication cables in industrial applications due to their easy handling and relatively low costs. The link length ranges from several meters to several kilometers.

Mounting of connectors for gradient fibres is achieved by the use of adhesive.

For POF²⁾ or HCS^{® 1)} fibres, the crimping technique eases the connector attachment.

With the advanced HARTING quick assembly components, POF-cables can be mounted without the need of special tools. HARTING F.O. systems are designed for gradient index fibres with a core diameter of 50 and 62.5 µm as well as for 200 µm (HCS^{® 1)}) and 1 mm (POF²⁾) step index fibres.

The typical operating wavelengths are 660 nm (POF²⁾, HCS^{® 1)}), 850 nm (GI, HCS^{® 1)}) and 1300 nm (GI).

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

Dimensioning of F.O. Transmission Systems

For reliable operation of a F.O. data transmission system it is essential that the transmitted optical signals arrive at the receiver with sufficient amplitude. The incident power should at least exceed twice (+ 3 dB) the value of the minimum sensitivity of the receiver. Otherwise, the inherent noise of the system may result in increasing randomly distributed transmission errors in the data transfer. Therefore, in system design the power budget of the optical path has to be checked. The following aspects have to be considered:

- Optical power output of the transmitter
The optical power generated by the LED does mainly depend on the applied forward current. Typical power levels coupled into the core are:

for glass-fibre ($\lambda = 850 \text{ nm}$):	
50/ 125 μm GI fibre:	80 μW
200/ 230 μm SI fibre:	250 μW
for Polymer fibre ($\lambda = 660 \text{ nm}$):	
980/1000 μm :	600 μW

- Specific attenuation-coefficient of the fibre
The specific attenuation of optical fibres depends on the wavelength applied and is specified in dB/km. Typical values are:

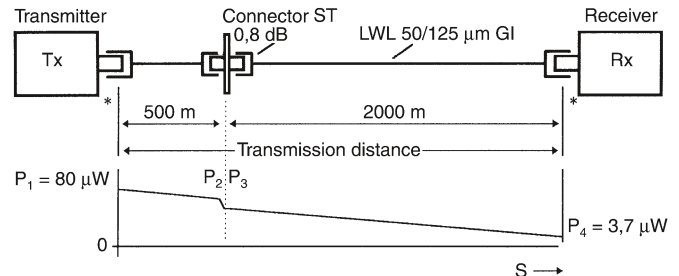
for glass-fibres ($\lambda = 850 \text{ nm}$):	
50/ 125 μm GI fibre:	---3 dB/km
200/ 230 μm HCS:	---5 dB/km
for polymer fibre ($\lambda = 660 \text{ nm}$):	
980/1000 μm (PMMA):	---0.2 dB/m

The fibre loss usually contributes to the highest amount to the overall transmission index of the optical link.

- Additional interconnections in the cable system
Interconnections in the optical link create some further attenuation for the travelling optical signals. Typical insertion loss is
 - for a spliced connection $\leq 0.3 \text{ dB}$
 - for a connector-set $0.8 \text{ dB} \dots 0.5 \text{ dB}$
 depending on the type of fibre and the connectors applied.
- Sensitivity of the optical receiver DC-coupled optical receivers, commonly used, with Si-diodes as receiving elements show typical minimum sensitivities of
 - $\leq 3 \mu\text{W}$ @ 850 nm (glass fibre systems)
 - $\leq 5 \mu\text{W}$ @ 660 nm (polymer fibre systems)
- Temperature dependence and ageing of LED, thermal influence on cable loss
These items should be taken into account with an amount of 2 dB. Thus, in total a system reserve of 5 dB has to be considered in the link power budget.

Examples

a) Glass fibre system ($\lambda = 850 \text{ nm}$)



Link budget analysis:

Transmitter:

$$P_1 = 80 \mu\text{W} = -11 \text{ dBm}$$

power coupled into fibre core

$$\text{Cable Loss: } 2.5 \text{ km} \times 3 \text{ dB/km} = 7.5 \text{ dB}$$

$$\text{Loss per connector set ST} = 0.8 \text{ dB}$$

$$\text{System reserves (3 dB + 2 dB)} = 5.0 \text{ dB}$$

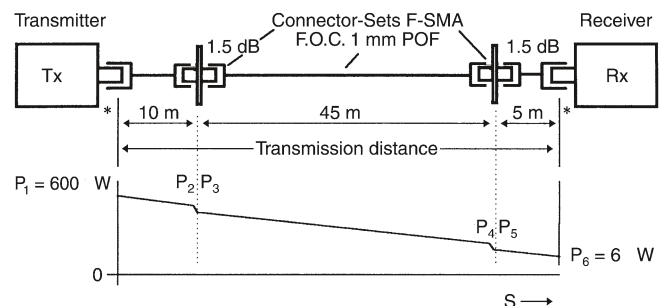
$$\text{Total system losses: } 13.3 \text{ dB}$$

$$\text{Incident power at receiver: } P_4 = -24.3 \text{ dBm} = 3.7 \mu\text{W}$$

This satisfies the required minimum-conditions $\geq 3 \mu\text{W}$

* The injection- and decoupling-loss at the transmitter- and receiver-ends of the fibre has not additionally to be taken into account as they are already included in the given power ratings of these elements.

b) Polymer fibre system ($\lambda = 660 \text{ nm}$)



Link budget analysis:

Transmitter:

$$P_1 = 600 \mu\text{W} = -2.2 \text{ dBm}$$

power coupled into fibre core

$$\text{Cable loss: } 60 \text{ m} \times 0.2 \text{ dB/m} = 12 \text{ dB}$$

$$2 \text{ connector-sets F-SMA (2 x 1.5 dB)} = 3.0 \text{ dB}$$

$$\text{System reserves (3 dB + 2 dB)} = 5.0 \text{ dB}$$

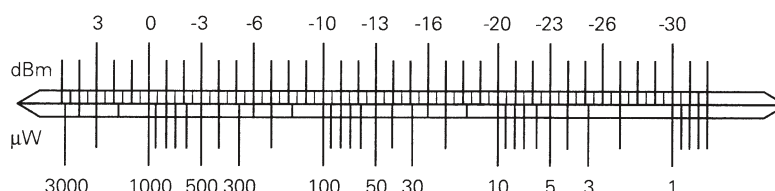
$$\text{Total system losses: } 20.0 \text{ dB}$$

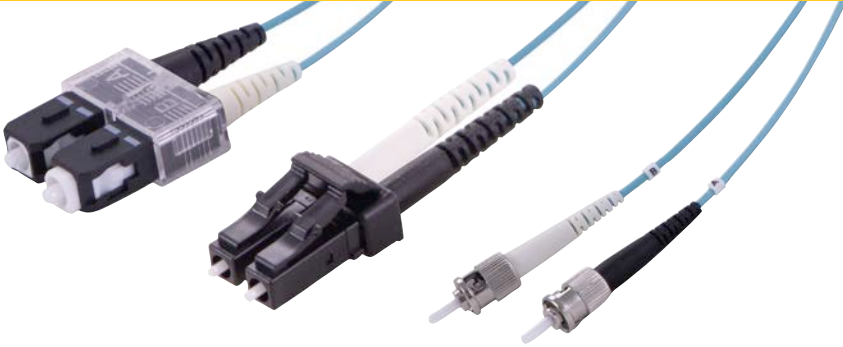
$$\text{Incident power at receiver: } P_6 = -22.2 \text{ dBm} = 6.0 \mu\text{W}$$

This satisfies the required minimum-conditions $\geq 5 \mu\text{W}$

Omitting the additional interconnections in the cable (here e.g. the 2 F-SMA connector sets) results in larger maximum transmission distances.

Conversion Diagram





System cable fibre optics

Features

Advantages

• Connector types • Type of core • Number of cores • Wiring • Sheath material	LC/SC/ST Multi mode, OM3 2 Crossed (boot marking) LSZH	• Transmission of up to 10 Gbit/s • Flexible, space saving • Verified after assembling • Halogen free and RoHS compliant • Compliant acc. ISO/IEC 11801
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Applications

- Industrial cabling
- Within switch cabinets
- In IT Networks



System cable fibre optics

Identification	Part number	Drawing	Dimensions in mm
Jumper cable 2 x LC duplex multi mode 50/125 µm Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 241 0010 027 33 01 241 0020 027 33 01 241 0030 027 33 01 241 0040 027 33 01 241 0050 027 33 01 241 0060 027 33 01 241 0070 027 33 01 241 0080 027 33 01 241 0090 027 33 01 241 0100 027		
Jumper cable 2 x SC duplex multi mode 50/125 µm Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 241 0010 006 33 01 241 0020 006 33 01 241 0030 006 33 01 241 0040 006 33 01 241 0050 006 33 01 241 0060 006 33 01 241 0070 006 33 01 241 0080 006 33 01 241 0090 006 33 01 241 0100 006		
Jumper cable 2 x ST multi mode 50/125 µm Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 241 0010 007 33 01 241 0020 007 33 01 241 0030 007 33 01 241 0040 007 33 01 241 0050 007 33 01 241 0060 007 33 01 241 0070 007 33 01 241 0080 007 33 01 241 0090 007 33 01 241 0100 007		

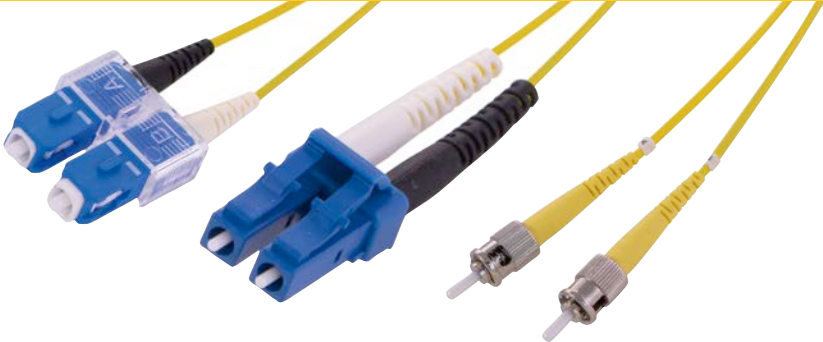
Other cable lengths on request



System cable fibre optics

Identification	Part number	Drawing	Dimensions in mm
Adapter cable SC duplex – LC duplex multi mode 50/125 µm Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 241 0010 034 33 01 241 0020 034 33 01 241 0030 034 33 01 241 0040 034 33 01 241 0050 034 33 01 241 0060 034 33 01 241 0070 034 33 01 241 0080 034 33 01 241 0090 034 33 01 241 0100 034		
Adapter cable LC duplex – 2 x ST multi mode 50/125 µm OM3 Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 441 0010 024 33 01 441 0020 024 33 01 441 0030 024 33 01 441 0040 024 33 01 441 0050 024 33 01 441 0060 024 33 01 441 0070 024 33 01 441 0080 024 33 01 441 0090 024 33 01 441 0100 024		
Adapter cable SC duplex – 2 x ST multi mode 50/125 µm OM3 Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 412 0100 027 33 01 412 0200 027 33 01 412 0300 027 33 01 412 0400 027 33 01 412 0500 027 33 01 412 0600 027 33 01 412 0700 027 33 01 412 0800 027 33 01 412 0900 027 33 01 412 1000 027		

Other cable lengths on request



System cable fibre optics

Features

Advantages

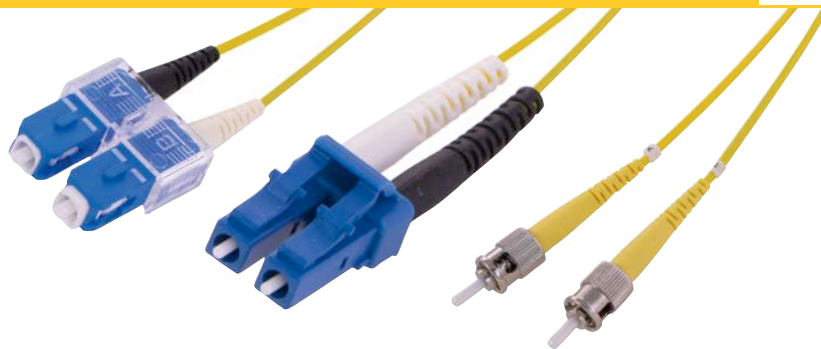
• Connector types	LC/SC/ST
• Type of core	Single mode, G657.A1
• Number of cores	2
• Wiring	Crossed (boot marking)
• Sheath material	LSZH

- Transmission of up to 10 Gbit/s
- Flexible, space saving
- Verified after assembling
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Applications

- Industrial cabling
- Within switch cabinets
- In IT Networks

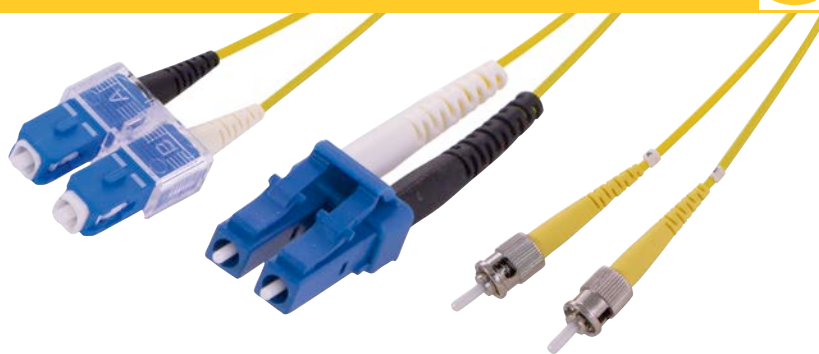
Other cable lengths on request



System cable fibre optics

Identification	Part number	Drawing	Dimensions in mm
Jumper cable 2 x LC duplex single mode 9/125 µm G657.A1 Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 241 0010 008 33 01 241 0020 008 33 01 241 0030 008 33 01 241 0040 008 33 01 241 0050 008 33 01 241 0060 008 33 01 241 0070 008 33 01 241 0080 008 33 01 241 0090 008 33 01 241 0100 008		
Jumper cable 2 x SC duplex single mode 9/125 µm G657.A1 Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 241 0010 009 33 01 241 0020 009 33 01 241 0030 009 33 01 241 0040 009 33 01 241 0050 009 33 01 241 0060 009 33 01 241 0070 009 33 01 241 0080 009 33 01 241 0090 009 33 01 241 0100 009		
Adapter cable SC duplex – LC duplex single mode 9/125 µm G657.A1 Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 241 0010 036 33 01 241 0020 036 33 01 241 0030 036 33 01 241 0040 036 33 01 241 0050 036 33 01 241 0060 036 33 01 241 0070 036 33 01 241 0080 036 33 01 241 0090 036 33 01 241 0100 036		

Other cable lengths on request



System cable fibre optics

Identification	Part number	Drawing	Dimensions in mm
Adapter cable SC duplex – LC duplex single mode 9/125 µm , G657.A1 Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 241 0010 033 33 01 241 0020 033 33 01 241 0030 033 33 01 241 0040 033 33 01 241 0050 033 33 01 241 0060 033 33 01 241 0070 033 33 01 241 0080 033 33 01 241 0090 033 33 01 241 0100 033		
Jumper cable LC duplex – 2 x ST single mode 9/125 µm , G657.A1 Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 412 0100 008 33 01 412 0200 008 33 01 412 0300 008 33 01 412 0400 008 33 01 412 0500 008 33 01 412 0600 008 33 01 412 0700 008 33 01 412 0800 008 33 01 412 0900 008 33 01 412 1000 008		
Adapter cable SC duplex – 2 x ST single mode 9/125 µm , G657.A1 Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m	33 01 412 0100 007 33 01 412 0200 007 33 01 412 0300 007 33 01 412 0400 007 33 01 412 0500 007 33 01 412 0600 007 33 01 412 0700 007 33 01 412 0800 007 33 01 412 0900 007 33 01 412 1000 007		

Other cable lengths on request

Identification	Part number	Part number	Drawing	Dimensions in mm
HARTING PushPull Protection cover for Hybrid Signal, USB, RJ45, Power and LC duplex, device side, plastic Protection cover IP40 Protection cover IP65 / IP67, Version with passive locking without cord Version with passive locking with plastic cord for fixing screw Version with passive locking with nylon cord for fixing screw Version with active locking without cord Version with active locking with plastic cord for fixing screw Version with active locking with nylon cord for fixing screw	09 45 845 0003 000 09 45 845 0009 024 09 45 845 0009 000 09 45 845 0011 024 09 45 845 0015 000 09 45 845 0014 000 09 45 845 0013 000		 	
HARTING PushPull Protection cover for Hybrid Signal, USB, RJ45, Power and LC duplex, connectors, plastic Protection cover IP65 / IP67, with cord for fixing screw	09 45 845 0010 000			
HARTING PushPull Blinding plate	09 45 845 0019 000			
HARTING PushPull LC duplex Panel feed through metal, multi mode GOF EasyInstall metal, single mode GOF EasyInstall plastic, multi mode GOF Compact plastic, single mode GOF Compact	09 57 468 0500 000 09 57 468 0501 000 09 57 442 0511 000 09 57 442 0512 000		 	
HARTING PushPull LC duplex systems cable Other cable types on request Length: 1.0 m single mode 1.0 m multi mode 50 / 125 1.0 m multi mode 62.5 / 125 10.0 m single mode 10.0 m multi mode 50 / 125 10.0 m multi mode 62.5 / 125	Metal 33 58 231 0010 026 33 58 231 0010 027 33 58 231 0010 028 33 58 231 0100 026 33 58 231 0100 027 33 58 231 0100 028	Plastic 33 61 221 0010 001 33 61 221 0010 002 33 61 221 0010 003 33 61 221 0100 001 33 61 221 0100 002 33 61 221 0100 003		



Features

• Connector types	PushPull V4
• Type of core	Single and multi mode
• Number of cores	2
• Wiring	Crossed
• Sheath material	PUR
• Degree of protection	IP68
• Temperature range	-40 °C ... +85 °C

Advantages

- Transmission of up to 10 Gbit/s
- Flexible, space saving
- Simple handling by HARTING PushPull
- Suitable for outdoor application
- With security clip against accidental unlocking

Applications

- Industrial cabling
- Outdoor installation
- Antenna cabling



Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, PushPull V4, single mode 9/125 G657.A1, overmoulded Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m a = 11 m a = 12 m a = 13 m a = 14 m a = 15 m a = 20 m a = 25 m a = 30 m a = 35 m a = 40 m a = 45 m a = 50 m a = 60 m a = 70 m a = 80 m a = 90 m a = 100 m	33 61 221 0010 001 33 61 221 0020 001 33 61 221 0030 001 33 61 221 0040 001 33 61 221 0050 001 33 61 221 0060 001 33 61 221 0070 001 33 61 221 0080 001 33 61 221 0090 001 33 61 221 0100 001 33 61 221 0110 001 33 61 221 0120 001 33 61 221 0130 001 33 61 221 0140 001 33 61 221 0150 001 33 61 221 0200 001 33 61 221 0250 001 33 61 221 0300 001 33 61 221 0350 001 33 61 221 0400 001 33 61 221 0450 001 33 61 221 0500 001 33 61 221 0600 001 33 61 221 0700 001 33 61 221 0800 001 33 61 221 0900 001 33 61 221 1000 001	a = length X (without dust cap) Y (without dust cap) Loading-Plan A fiber 1 B B fiber 2 A	
Fibre optic breakout cable, single mode 9/125 G657.A1 Length: 10 m Length: 20 m Length: 100 m	33 58 751 0100 002 33 58 751 0200 002 33 58 751 1000 002	PUR jacket 2-fibre single mode Outer diameter: 6.5 mm Min. bending radius: 10.4 cm Installation: 5.2 cm Operating:	

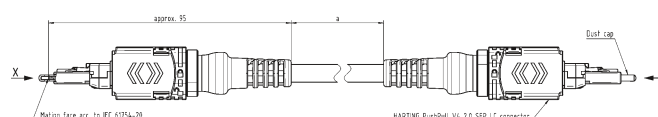
Other cable lengths on request



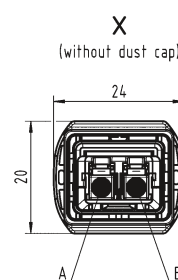
Identification	Part number	Drawing	Dimensions in mm
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Fibre optic cable, double ended,
PushPull V4, multi mode,
50 / 125 μ m, OM3
overmoulded

Length: a = 1 m	33 61 221 0010 002
a = 2 m	33 61 221 0020 002
a = 3 m	33 61 221 0030 002
a = 4 m	33 61 221 0040 002
a = 5 m	33 61 221 0050 002
a = 6 m	33 61 221 0060 002
a = 7 m	33 61 221 0070 002
a = 8 m	33 61 221 0080 002
a = 9 m	33 61 221 0090 002
a = 10 m	33 61 221 0100 002
a = 11 m	33 61 221 0110 002
a = 12 m	33 61 221 0120 002
a = 13 m	33 61 221 0130 002
a = 14 m	33 61 221 0140 002
a = 15 m	33 61 221 0150 002
a = 20 m	33 61 221 0200 002
a = 25 m	33 61 221 0250 002
a = 30 m	33 61 221 0300 002
a = 35 m	33 61 221 0350 002
a = 40 m	33 61 221 0400 002
a = 45 m	33 61 221 0450 002
a = 50 m	33 61 221 0500 002
a = 60 m	33 61 221 0600 002
a = 70 m	33 61 221 0700 002
a = 80 m	33 61 221 0800 002
a = 90 m	33 61 221 0900 002
a = 100 m	33 61 221 1000 002

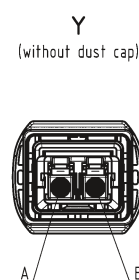


a = length



Loading-Plan

A	fiber 1	B
B	fiber 2	A



Fibre optic breakout cable,
multi mode, 50 / 125 μ m, OM3

Length: 10 m	33 58 751 0100 003
Length: 20 m	33 58 751 0200 003
Length: 100 m	33 58 751 1000 003



PUR jacket
2-fibre multi mode 50 μ m
Outer diameter: 6.5 mm
Min. bending radius:
Installation: 10.4 cm
Operating: 5.2 cm

Other cable lengths on request



Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, PushPull V4, multi mode 62,5/125 OM1, overmoulded Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m a = 11 m a = 12 m a = 13 m a = 14 m a = 15 m a = 20 m a = 25 m a = 30 m a = 35 m a = 40 m a = 45 m a = 50 m a = 60 m a = 70 m a = 80 m a = 90 m a = 100 m	33 61 221 0010 003 33 61 221 0020 003 33 61 221 0030 003 33 61 221 0040 003 33 61 221 0050 003 33 61 221 0060 003 33 61 221 0070 003 33 61 221 0080 003 33 61 221 0090 003 33 61 221 0100 003 33 61 221 0110 003 33 61 221 0120 003 33 61 221 0130 003 33 61 221 0140 003 33 61 221 0150 003 33 61 221 0200 003 33 61 221 0250 003 33 61 221 0300 003 33 61 221 0350 003 33 61 221 0400 003 33 61 221 0450 003 33 61 221 0500 003 33 61 221 0600 003 33 61 221 0700 003 33 61 221 0800 003 33 61 221 0900 003 33 61 221 1000 003	approx. 55 X Y Dust cap Mating face acc. to IEC 61754-20 HARTING PushPull V4 2.0 SFP LC connector a = length X (without dust cap) 24 20 A B Loading-Plan A fiber 1 B B fiber 2 A Y (without dust cap) A B	
Fibre optic breakout cable, multi mode 62,5/125 OM1 Length: 10 m Length: 20 m Length: 100 m	33 58 751 0100 001 33 58 751 0200 001 33 58 751 1000 001	PUR jacket 2-fibre multi mode Outer diameter: Min. bending radius: Installation: Operating:	62.5 µm 7 mm 10.5 cm 7.0 cm

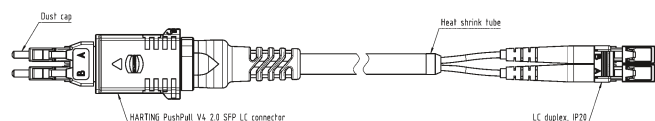
Other cable lengths on request



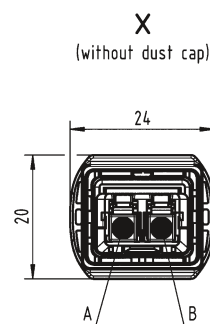
Identification	Part number	Drawing	Dimensions in mm
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Fibre optic cable,
PushPull V4 – LC duplex,
single mode 9/125 G657.A1,
overmoulded

Length: a = 1 m	33 61 431 0010 001
a = 2 m	33 61 431 0020 001
a = 3 m	33 61 431 0030 001
a = 4 m	33 61 431 0040 001
a = 5 m	33 61 431 0050 001
a = 6 m	33 61 431 0060 001
a = 7 m	33 61 431 0070 001
a = 8 m	33 61 431 0080 001
a = 9 m	33 61 431 0090 001
a = 10 m	33 61 431 0100 001
a = 11 m	33 61 431 0110 001
a = 12 m	33 61 431 0120 001
a = 13 m	33 61 431 0130 001
a = 14 m	33 61 431 0140 001
a = 15 m	33 61 431 0150 001
a = 20 m	33 61 431 0200 001
a = 25 m	33 61 431 0250 001
a = 30 m	33 61 431 0300 001
a = 35 m	33 61 431 0350 001
a = 40 m	33 61 431 0400 001
a = 45 m	33 61 431 0450 001
a = 50 m	33 61 431 0500 001
a = 60 m	33 61 431 0600 001
a = 70 m	33 61 431 0700 001
a = 80 m	33 61 431 0800 001
a = 90 m	33 61 431 0900 001
a = 100 m	33 61 431 1000 001



a = length



Loading-Plan

A — fiber 1 — B
B — fiber 2 — A

Fibre optic breakout cable,
single mode 9/125 G657.A1

Length: 10 m	33 58 751 0100 002
Length: 20 m	33 58 751 0200 002
Length: 100 m	33 58 751 1000 002



PUR jacket
2-fibre single mode
Outer diameter: 6.5 mm
Min. bending radius:
Installation: 10.4 cm
Operating: 5.2 cm

Other cable lengths on request



Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, PushPull V4 – LC duplex, multi mode, 50 / 125 µm, OM3 overmoulded Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m a = 11 m a = 12 m a = 13 m a = 14 m a = 15 m a = 20 m a = 25 m a = 30 m a = 35 m a = 40 m a = 45 m a = 50 m a = 60 m a = 70 m a = 80 m a = 90 m a = 100 m	33 61 431 0010 002 33 61 431 0020 002 33 61 431 0030 002 33 61 431 0040 002 33 61 431 0050 002 33 61 431 0060 002 33 61 431 0070 002 33 61 431 0080 002 33 61 431 0090 002 33 61 431 0100 002 33 61 431 0110 002 33 61 431 0120 002 33 61 431 0130 002 33 61 431 0140 002 33 61 431 0150 002 33 61 431 0200 002 33 61 431 0250 002 33 61 431 0300 002 33 61 431 0350 002 33 61 431 0400 002 33 61 431 0450 002 33 61 431 0500 002 33 61 431 0600 002 33 61 431 0700 002 33 61 431 0800 002 33 61 431 0900 002 33 61 431 1000 002	a = length X (without dust cap) Y (without protection cap) Loading-Plan A — fiber 1 — B B — fiber 2 — A	
Fibre optic breakout cable, multi mode, 50 / 125 µm, OM3 Length: 10 m Length: 20 m Length: 100 m	33 58 751 0100 003 33 58 751 0200 003 33 58 751 1000 003	PUR jacket 2-fibre multi mode Outer diameter: Min. bending radius: Installation: Operating:	50 µm 6.5 mm 10.4 cm 5.2 cm

Other cable lengths on request



Identification

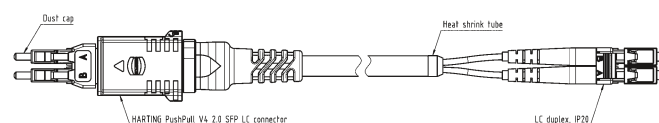
Part number

Drawing

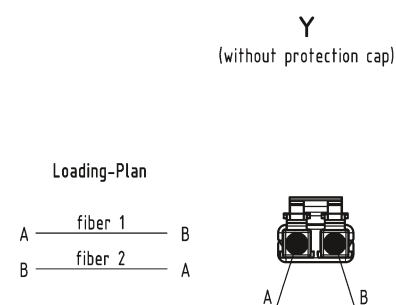
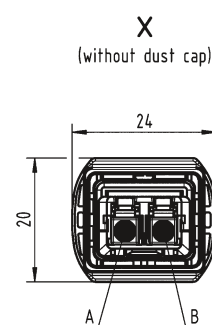
Dimensions in mm

Fibre optic cable,
PushPull V4 – LC duplex,
multi mode 62,5/125 OM1,
overmoulded

Length: a = 1 m	33 61 431 0010 003
a = 2 m	33 61 431 0020 003
a = 3 m	33 61 431 0030 003
a = 4 m	33 61 431 0040 003
a = 5 m	33 61 431 0050 003
a = 6 m	33 61 431 0060 003
a = 7 m	33 61 431 0070 003
a = 8 m	33 61 431 0080 003
a = 9 m	33 61 431 0090 003
a = 10 m	33 61 431 0100 003
a = 11 m	33 61 431 0110 003
a = 12 m	33 61 431 0120 003
a = 13 m	33 61 431 0130 003
a = 14 m	33 61 431 0140 003
a = 15 m	33 61 431 0150 003
a = 20 m	33 61 431 0200 003
a = 25 m	33 61 431 0250 003
a = 30 m	33 61 431 0300 003
a = 35 m	33 61 431 0350 003
a = 40 m	33 61 431 0400 003
a = 45 m	33 61 431 0450 003
a = 50 m	33 61 431 0500 003
a = 60 m	33 61 431 0600 003
a = 70 m	33 61 431 0700 003
a = 80 m	33 61 431 0800 003
a = 90 m	33 61 431 0900 003
a = 100 m	33 61 431 1000 003



a = length



Fibre optic breakout cable,
multi mode 62,5/125 OM1

Length: 10 m

33 58 751 0100 001

Length: 20 m

33 58 751 0200 001

Length: 100 m

33 58 751 1000 001



PUR jacket

2-fibre multi mode 62.5 µm

Outer diameter: 7 mm

Min. bending radius:
Installation: 10.5 cm
Operating: 7.0 cm

Other cable lengths on request



Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, PushPull V4 – SC duplex, single mode 9/125 G657.A1, overmoulded Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m a = 11 m a = 12 m a = 13 m a = 14 m a = 15 m a = 20 m a = 25 m a = 30 m a = 35 m a = 40 m a = 45 m a = 50 m a = 60 m a = 70 m a = 80 m a = 90 m a = 100 m	33 61 431 0010 004 33 61 431 0020 004 33 61 431 0030 004 33 61 431 0040 004 33 61 431 0050 004 33 61 431 0060 004 33 61 431 0070 004 33 61 431 0080 004 33 61 431 0090 004 33 61 431 0100 004 33 61 431 0110 004 33 61 431 0120 004 33 61 431 0130 004 33 61 431 0140 004 33 61 431 0150 004 33 61 431 0200 004 33 61 431 0250 004 33 61 431 0300 004 33 61 431 0350 004 33 61 431 0400 004 33 61 431 0450 004 33 61 431 0500 004 33 61 431 0600 004 33 61 431 0700 004 33 61 431 0800 004 33 61 431 0900 004 33 61 431 1000 004	a = length	
Fibre optic breakout cable, single mode 9/125 G657.A1 Length: 10 m Length: 20 m Length: 100 m	33 58 751 0100 002 33 58 751 0200 002 33 58 751 1000 002	PUR jacket 2-fibre single mode Outer diameter: 6.5 mm Min. bending radius: 10.4 cm Installation: 5.2 cm Operating:	

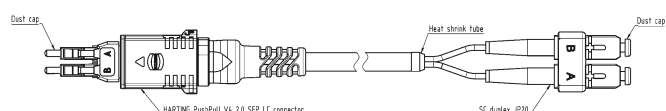
Other cable lengths on request



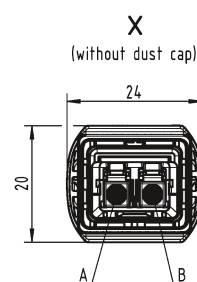
Identification	Part number	Drawing	Dimensions in mm
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Fibre optic cable, double ended,
PushPull V4 – SC duplex,
multi mode, 50 / 125 µm, OM3
overmoulded

Length: a = 1 m	33 61 431 0010 005
a = 2 m	33 61 431 0020 005
a = 3 m	33 61 431 0030 005
a = 4 m	33 61 431 0040 005
a = 5 m	33 61 431 0050 005
a = 6 m	33 61 431 0060 005
a = 7 m	33 61 431 0070 005
a = 8 m	33 61 431 0080 005
a = 9 m	33 61 431 0090 005
a = 10 m	33 61 431 0100 005
a = 11 m	33 61 431 0110 005
a = 12 m	33 61 431 0120 005
a = 13 m	33 61 431 0130 005
a = 14 m	33 61 431 0140 005
a = 15 m	33 61 431 0150 005
a = 20 m	33 61 431 0200 005
a = 25 m	33 61 431 0250 005
a = 30 m	33 61 431 0300 005
a = 35 m	33 61 431 0350 005
a = 40 m	33 61 431 0400 005
a = 45 m	33 61 431 0450 005
a = 50 m	33 61 431 0500 005
a = 60 m	33 61 431 0600 005
a = 70 m	33 61 431 0700 005
a = 80 m	33 61 431 0800 005
a = 90 m	33 61 431 0900 005
a = 100 m	33 61 431 1000 005



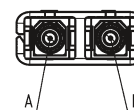
a = length



Y
(without dust cap)

Loading-Plan

A — fiber 1 — B
B — fiber 2 — A



Fibre optic breakout cable,
multi mode, 50 / 125 µm, OM3

Length: 10 m	33 58 751 0100 003
Length: 20 m	33 58 751 0200 003
Length: 100 m	33 58 751 1000 003



PUR jacket
2-fibre multi mode 50 µm
Outer diameter: 6.5 mm
Min. bending radius:
Installation: 10.4 cm
Operating: 5.2 cm

Other cable lengths on request



Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, PushPull V4 – SC duplex, multi mode, 62.5 / 125 µm overmoulded Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m a = 11 m a = 12 m a = 13 m a = 14 m a = 15 m a = 20 m a = 25 m a = 30 m a = 35 m a = 40 m a = 45 m a = 50 m a = 60 m a = 70 m a = 80 m a = 90 m a = 100 m	33 61 431 0010 006 33 61 431 0020 006 33 61 431 0030 006 33 61 431 0040 006 33 61 431 0050 006 33 61 431 0060 006 33 61 431 0070 006 33 61 431 0080 006 33 61 431 0090 006 33 61 431 0100 006 33 61 431 0110 006 33 61 431 0120 006 33 61 431 0130 006 33 61 431 0140 006 33 61 431 0150 006 33 61 431 0200 006 33 61 431 0250 006 33 61 431 0300 006 33 61 431 0350 006 33 61 431 0400 006 33 61 431 0450 006 33 61 431 0500 006 33 61 431 0600 006 33 61 431 0700 006 33 61 431 0800 006 33 61 431 0900 006 33 61 431 1000 006	a = length	
Fibre optic breakout cable, multi mode, 62.5 / 125 µm Length: 10 m Length: 20 m Length: 100 m	33 58 751 0100 001 33 58 751 0200 001 33 58 751 1000 001	PUR jacket 2-fibre multi mode Outer diameter: Min. bending radius: Installation: Operating:	62.5 µm 7 mm 10.5 cm 7.0 cm

Other cable lengths on request



Features

- | | |
|-------------------|--------------------------------|
| • Connector types | 2 x Han® 3 A,
2 x LC duplex |
| • Type of core | Single and multi mode |
| • Sheath material | PVC, FRNC |

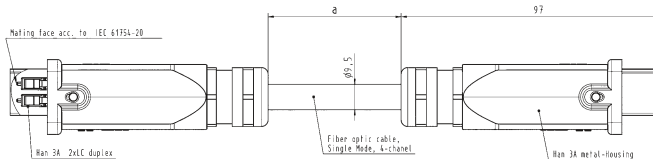
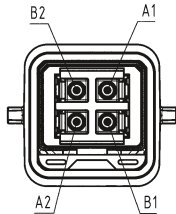
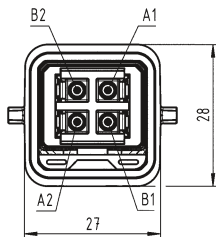
Advantages

- Transmission of up to 10 Gbit/s
- Extremely robust
- Secured locking by Han® 3 A housing
- Suitable for outdoor application

Applications

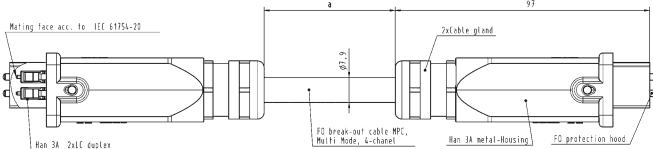
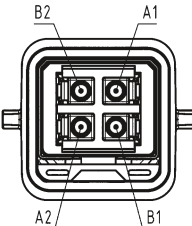
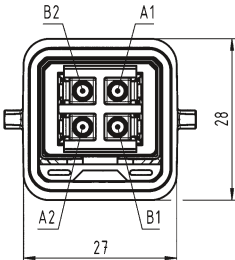
- Industrial cabling
- Outdoor installation
- Antenna cabling
- Mining industry



Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, single mode, metal 2 x Han® 3 A, 2 x LC duplex		double ended 	
Length: a = 1 m	33 54 211 0010 001	a = length	
a = 5 m	33 54 211 0050 001		
a = 10 m	33 54 211 0100 001		
a = 20 m	33 54 211 0200 001		
a = 40 m	33 54 211 0400 001		
a = 50 m	33 54 211 0500 001		
a = 100 m	33 54 211 1000 001		
		X (without protection cap)  Y (without protection cap)  Loading-Plan A1 — yellow 1 — B2 B1 — yellow 2 — A2 A2 — yellow 3 — B1 B2 — yellow 4 — A1	
		Protection level: IP65 / IP67	

Other cable lengths on request



Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, multi mode, metal, 50/125 µm 2 x Han® 3 A, 2 x LC duplex Length: a = 1 m a = 5 m a = 10 m a = 20 m a = 40 m a = 50 m a = 100 m		double ended  a = length X (without protection cap)  Y (without protection cap)  Loading-Plan A1 grey 1 (interior turquoise) B2 B1 grey 2 (interior white) A2 A2 grey 3 (interior white) B1 B2 grey 4 (interior white) A1	

Protection level: IP65 / IP67

Other cable lengths on request



Features

- | | |
|-------------------|-----------------------------|
| • Connector types | Han® 3 A, LC duplex, Hybrid |
| • Type of core | Single and multi mode |
| • Number of cores | 2 + 3 x power |
| • Wiring | Crossed (power 1:1) |
| • Sheath material | PVC |

Advantages

- Transmission of up to 10 Gbit/s
- Extremely robust
- Secured locking by Han® 3 A housing
- Suitable for outdoor application

Applications

- Industrial cabling
- Outdoor installation
- Antenna cabling
- Mining industry



Identification

Part number

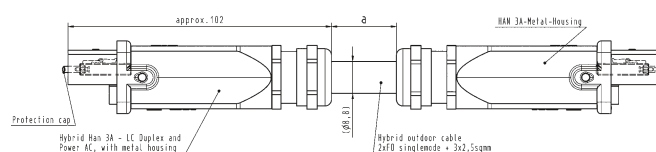
Drawing

Dimensions in mm

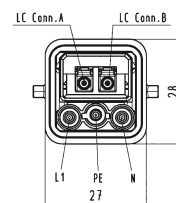
Hybrid fibre optic cable,
single mode, double ended
2 x FO + 3 x 2.5 mm², 2 x Han® 3 A

Length: a = 1 m	AC version	33 57 211 0015 003
	DC version	33 57 211 0015 004
a = 5 m	AC version	33 57 211 0055 003
	DC version	33 57 211 0055 004
a = 10 m	AC version	33 57 211 0105 003
	DC version	33 57 211 0105 004
a = 20 m	AC version	33 57 211 0205 003
	DC version	33 57 211 0205 004
a = 40 m	AC version	33 57 211 0405 003
	DC version	33 57 211 0405 004
a = 50 m	AC version	33 57 211 0505 003
	DC version	33 57 211 0505 004
a = 100 m	AC version	33 57 211 1005 003
	DC version	33 57 211 1005 004

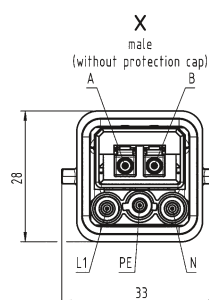
double ended



a = length

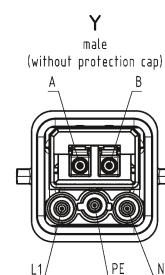


Protection level: IP65 / IP67

Loading-Plan
(Power AC version)

Shield (not connected)

A	Orange 1	B
B	Orange 2	A
L1	Black	
N	Blue	
PE	Green-Yellow	



Hybrid fibre optic cable,
single mode

Length: 10 m	33 57 851 0100 004
Length: 20 m	33 57 851 0200 004
Length: 100 m	33 57 851 1000 004



PVC jacket

2 x 9/125 + 3 x 2.5 mm²

Outer diameter: 12.6 mm

Min. bending radius:

single: 5 x OD
repeated: 10 x OD



Identification	Part number	Drawing	Dimensions in mm
Hybrid fibre optic cable, multi mode, double ended 2 x G50/125 + 3 x 2.5 mm² Length: a = 1 m AC version DC version a = 5 m AC version DC version a = 10 m AC version DC version a = 20 m AC version DC version a = 40 m AC version DC version a = 50 m AC version DC version a = 100 m AC version DC version	33 57 211 0015 001 33 57 211 0015 002 33 57 211 0055 001 33 57 211 0055 002 33 57 211 0105 001 33 57 211 0105 002 33 57 211 0205 001 33 57 211 0205 002 33 57 211 0405 001 33 57 211 0405 002 33 57 211 0505 001 33 57 211 0505 002 33 57 211 1005 001 33 57 211 1005 002	double ended a = length Protection level: IP65 / IP67 X male (without protection cap) Loading-Plan (Power AC version) (Shield not connected) A — Orange — B B — Blue — A L1 — Black — L1 N — Blue — N PE — Green-Yellow — PE Y male (without protection cap)	
Hybrid fibre optic cable, multi mode, 50 µm Length: 10 m Length: 20 m Length: 500 m	33 57 851 0100 002 33 57 851 0200 002 33 57 851 5000 002	PVC jacket 2 x G50/125 + 3 x 2.5 mm² Outer diameter: 12.6 mm Min. bending radius: single: 5 x OD repeated: 10 x OD	

Other cable lengths on request



System cable fibre optics

Features

Advantages

• Connector types • Type of core • Number of cores • Wiring • Sheath material	SCRJ POF, 980/1000 µm 2 Crossed PUR	• Transmission of up to 100 Mbit/s • Flexible, space saving • Simple connection to switches and SPS/controller • PROFINET compliant
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Applications

- Industrial cabling
- Industrial automation
- Switchboard cabling



System cable fibre optics

Identification

Part number

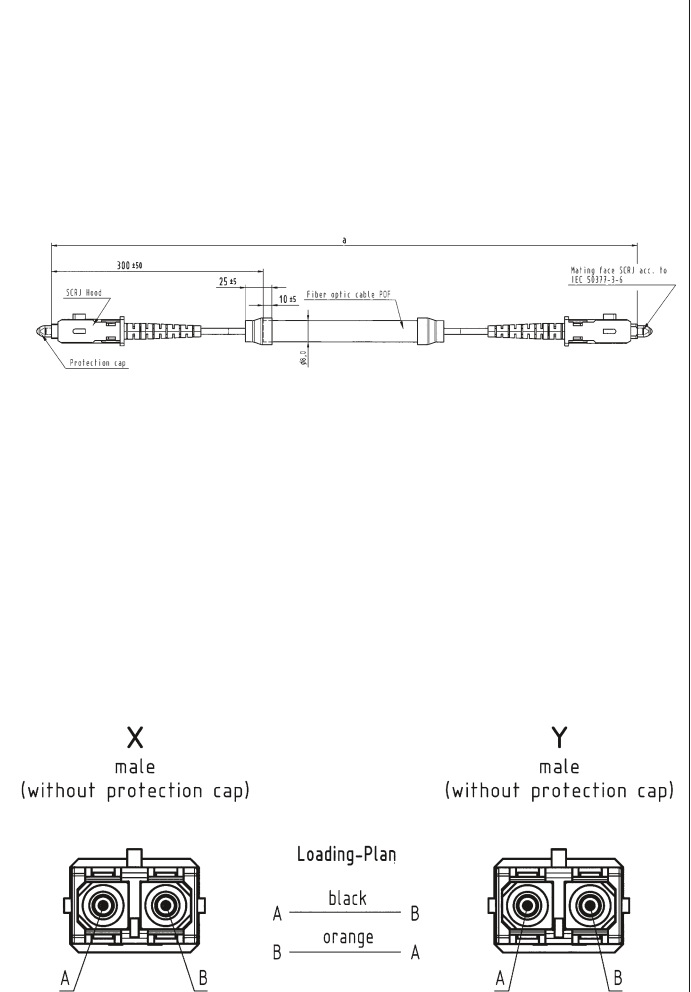
Drawing

Dimensions in mm

SCRJ
double ended
Hood: plastic hood with top entry
Cable: POF, multi mode,
980/1000 µm,
PROFINET type C

Length: a = 1 m
a = 2 m
a = 5 m
a = 10 m
a = 20 m

33 02 211 0010 001
33 02 211 0020 001
33 02 211 0050 001
33 02 211 0100 001
33 02 211 0200 001





Features

- | | |
|-------------------|--------------------|
| • Connector types | PushPull V14, SCRJ |
| • Type of core | POF, 980/1000 µm |
| • Number of cores | 2 |
| • Wiring | Crossed |
| • Sheath material | PUR |

Advantages

- Transmission of up to 100 Mbit/s
- Flexible, space saving
- Simple handling by HAN® PushPull
- PROFINET compliant

Applications

- Industrial cabling
- Industrial automation
- Outdoor installation

Fibre optic
cords



Identification	Part number	Drawing	Dimensions in mm
Han® PushPull SCRJ double ended Hood: plastic with straight entry Cable: POF, multi mode, 980/1000 µm, PROFINET type C Length: a = 1 m a = 2 m a = 5 m a = 10 m a = 20 m	33 53 211 0010 001 33 53 211 0020 001 33 53 211 0050 001 33 53 211 0100 001 33 53 211 0200 001		
Han® PushPull SCRJ double ended Hood: metal with straight entry Cable: POF, multi mode, 980/1000 µm, PROFINET type C Length: a = 1 m a = 2 m a = 5 m a = 10 m a = 20 m	33 53 211 0010 002 33 53 211 0020 002 33 53 211 0050 002 33 53 211 0100 002 33 53 211 0200 002		

Other cable lengths on request



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 SC contacts order separately	09 35 242 0333		
SCRJ IP20 POF connector with fast termination with crimp termination	09 35 002 4002 09 35 002 4003		
Contacts SC POF contact, 1 mm SC 125 GI contact SC 230 HCS contact	20 10 001 5217 20 10 125 5211 20 10 230 5211		

¹⁾ POF = Polymer-Optical Fibre

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



Han® PushPull, type acc. to IEC 61 076-3-117 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
a 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
Cable diameter	6.5 - 9.5 mm

Identification	Part number	Drawing	Dimensions in mm
Connector set, plastic incl. housing and SCRJ insert, POF contacts PROFINET-Identification: PROFINET O-Plug SCRJ incl. housing and SCRJ insert SC contacts order separately	09 35 241 0421 09 35 241 0422	2x SC-POF Stecker mit Klemm-Mutter 2x SC-POF connector with lock nut Datencontainer SCRJ data container SCRJ 2x SC-POF Stecker mit Klemm-Mutter 2x SC-POF connector with lock nut	
SCRJ IP20 POF connector	09 35 002 4002		
Protection cover IP65 / IP67	09 35 002 5411	Knickschutz bend protection	
Contacts SC POF contact, 1 mm SC 125 GI contact SC 230 HCS contact	20 10 001 5217 20 10 125 5211 20 10 230 5211		

Tooling see page 06.42

¹⁾ POF = Polymer-Optical Fibre

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



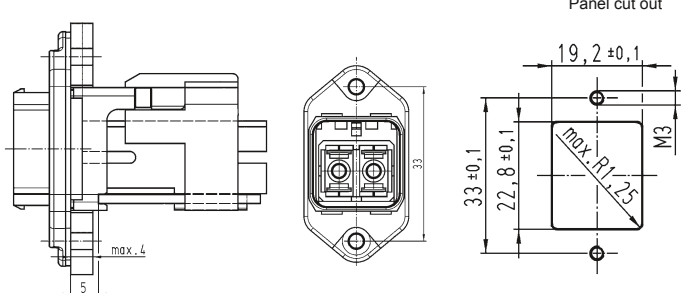
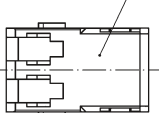
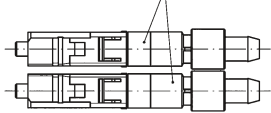
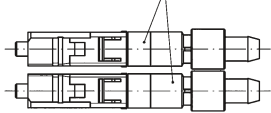
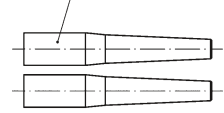
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 panel feed through
for optical connector based on SCRJ

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	Zinc die-cast, nickel plated

Identification	Part number	Drawing	Dimensions in mm
Han® PushPull SCRJ			Panel cut out
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)



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

Tooling see page 06.42

¹⁾ POF = Polymer-Optical Fibre

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



Han® PushPull, type acc. to IEC 61 076-3-117 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 61 754-24
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 incl. housing and SCRJ insert, POF crimp contacts	09 35 242 0401		
SCRJ IP20 POF crimp connector	09 35 002 4003		
Protection cover IP65 / IP67	09 35 002 5411		
Contacts SC POF crimp contact	20 10 001 5211		



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 61754-24
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)

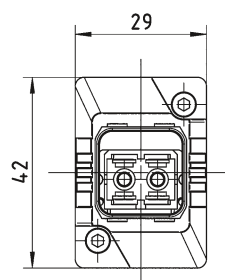
Identification

Han® PushPull SCRJ
Genderchanger metal

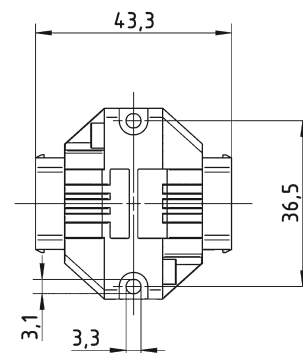
Part number

09 35 241 0501

Drawing



Dimensions in mm





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

Features		Technical characteristics																	
• 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)		<table><tr><td>Connector type</td><td>SCRJ crimp connector acc. to IEC 61754-24</td></tr><tr><td>Locking</td><td>PushPull technology acc. to IEC 61076-3-117 variant 14 (AIDA compliant)</td></tr><tr><td>Insertion loss</td><td>typically 1.5 to 2.0 dB</td></tr><tr><td>Termination SC contacts</td><td>Crimp termination technique</td></tr><tr><td>Fibre dimensions</td><td>POF 980 / 1000 µm</td></tr><tr><td>Fibre outer diameter</td><td>2.2 mm</td></tr><tr><td>Cable outer diameter</td><td>7 to 8.5 mm</td></tr><tr><td>No. of cutting operations</td><td>Maximum 2500</td></tr></table>		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 2500
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 2500																		
Identification		Part number	Drawing	Dimensions in mm															
Assembly tool set for POF crimp cutting, without final polishing The set contains - one crimping and cutting tool for 2500 operations - one sheath stripping tool - one Kevlar shear - one loading device for SC contacts Supplied in a robust plastic case		09 35 000 9915																	
Replacement cutting tool		09 35 000 9914																	



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, reuseable
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 2500

Identification	Part number	Drawing	Dimensions in mm
Assembly tool set for POF cutting, without final polishing The set contains - one stripping and cutting tool for 2500 operations - one sheath stripping tool - one Kevlar shear - one positioner for SCRJ contacts Supplied in a robust plastic case	09 35 000 9913		
Replacement cutting tool for 2500 operations	09 35 000 9914		
Assembly tool set for POF cutting, with final polishing Without an optical meter With an optical meter	20 99 000 3016 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		

PushPull XS SFP Device integration and system cable

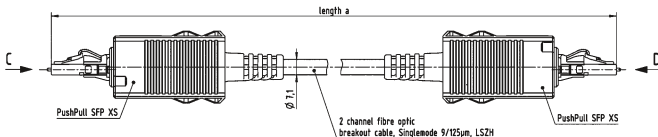
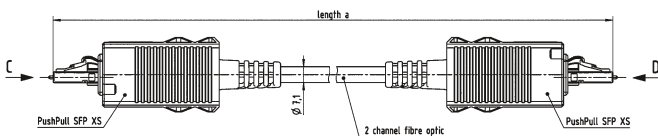
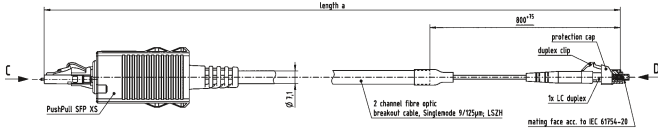
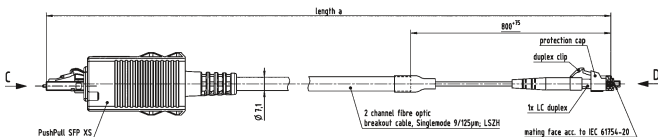


Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable PUR jacket multi mode 50/125 OM3, overmoulded Suitable for long housing and thus usable in the same port with PushPull XS SFP RJ45 assembled on both sides with PushPull XS SFP	33 26 231 xxx0 012 ¹⁾		
Fibre optic cable PUR jacket, multi mode 50/125 OM3 overmoulded Suitable for short housing assembled on both sides with PushPull XS SFP	33 26 231 xxx0 014 ²⁾		
Fibre optic cable PUR jacket, multi mode 50/125 OM3 overmoulded Suitable for long housing and thus usable in the same port with PushPull XS SFP RJ45 Page 1: PushPull XS SFP Page 2: LC duplex	33 26 231 xxx0 013 ¹⁾		
Fibre optic cable PUR jacket, multi mode 50/125 OM3 overmoulded Suitable for short housing Page 1: PushPull XS SFP Page 2: LC duplex	33 26 231 xxx0 018 ²⁾		

¹⁾ For housing 09 57 411 0501 201
²⁾ For housing 09 57 411 0501 200

PushPull XS SFP
Device integration
and system cable



Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable PUR jacket, single mode 9/125 G657.A1, overmoulded Suitable for long housing and thus usable in the same port with PushPull XS SFP RJ45 beidseitig mit PushPull XS SFP konfektioniert	33 26 231 xxx0 011 ¹⁾		
Fibre optic cable PUR jacket, single mode 9/125 G657.A1, overmoulded Suitable for short housing assembled on both sides with PushPull XS SFP	33 26 231 xxx0 015 ²⁾		
Fibre optic cable PUR jacket, single mode 9/125 G657.A1, overmoulded Suitable for long housing and thus usable in the same port with PushPull XS SFP RJ45 Page 1: PushPull XS SFP Page 2: LC duplex	33 26 231 xxx0 016 ¹⁾		
Fibre optic cable PUR jacket, single mode 9/125 G657.A1, overmoulded Suitable for short housing Page 1: PushPull XS SFP Page 2: LC duplex	33 26 231 xxx0 017 ²⁾		

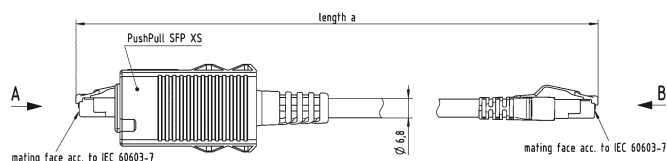
1) For housing 09 57 411 0501 201
2) For housing 09 57 411 0501 200



PushPull XS SFP
Device integration and system cables

Identification	Part number	Drawing	Dimensions in mm
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Cat. 6_A cable PVC jacket, 4x2xAWG26/7 overmoulded (PushPull XS SFP) Suitable for long housing and thus usable in the same port with PushPull XS SFP LC duplex - 3326231xxx0011 - 3326231xxx0012 - 3326231xxx0013 - 3326231xxx0016	33 25 231 xxx0 001		
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System cables and panel feed-throughs

Advantages

- IP68 rated, mated and unmated
- Hermaphroditic design: no male, no female. Always the correct mating face where needed
- Easy link extension by connecting multiple, identical cable assemblies
- No mismatching
- Extremely robust

Technical characteristics

Degree of protection	IP68, mated and unmated
Temperature range	-40 °C ... +85 °C
Housing material	Aluminium
Housing properties	Shock protected by rubber grip ring, dust cap and boot
Housing colour	RAL 1021 for better identification and differentiation from other cables
Available lengths	10 m, 25 m, 50 m, 100 m, 150 m, 200 m, 250 m, 500 m Other cable lengths on request
Fibres	2 and 4, multi and single mode

Identification	Part number	Drawing	Dimensions in mm
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Plug to plug cable assembly

2 channel

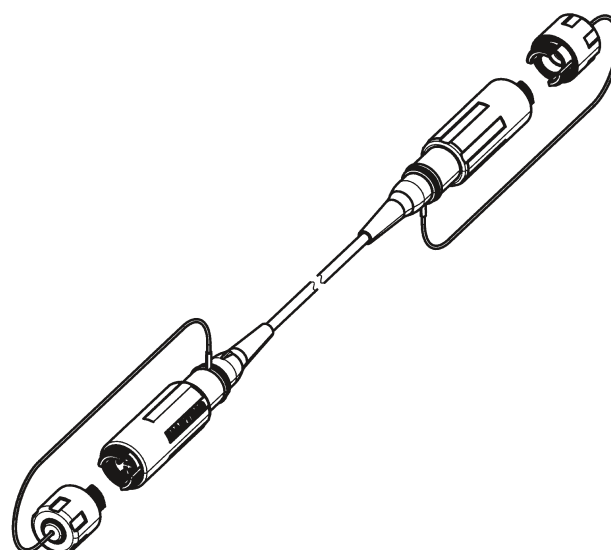
multi mode
single mode

33 04 211 xxx0 001
33 04 211 xxx0 003

4 channel

multi mode
single mode

33 04 211 xxx0 002
33 04 211 xxx0 004





System cables and panel feed-throughs

Identification	Part number	Drawing	Dimensions in mm
Bulkhead cable assembly, 1 m			
2 channel to 2 x LC multi mode single mode	33 04 411 0010 001		
	33 04 411 0010 005		
	33 04 411 0010 021		
	33 04 411 0010 025		
4 channel to 4 x LC multi mode single mode	33 04 411 0010 003		
	33 04 411 0010 006		
	33 04 411 0010 023		
	33 04 411 0010 026		
2 channel to 2 x SC multi mode single mode	33 04 411 0010 002		
	33 04 411 0010 007		
	33 04 411 0010 022		
	33 04 411 0010 027		
4 channel to 4 x SC multi mode single mode	33 04 411 0010 004		
	33 04 411 0010 008		
	33 04 411 0010 024		
	33 04 411 0010 028		

Other lengths on request

List of part numbers



Part number	Page	Part number	Page	Part number	Page	Part number	Page
09 10 000 0300	03.92	09 15 000 6121	05.31	09 35 002 5402 XL	03.77	09 45 100 1560	03.95
09 10 000 0400	03.92	09 15 000 6121	05.39	09 35 002 5403 XL	03.77	09 45 100 1560	03.98
09 10 000 0800	03.92	09 15 000 6122	05.31	09 35 002 5404	03.77	09 45 100 1560	04.05
09 10 000 5200	03.92	09 15 000 6122	05.39	09 35 002 5404 XL	03.77	09 45 100 1720	03.109
09 10 000 5300	03.92	09 15 000 6123	05.31	09 35 002 5411	06.35	09 45 100 1720	03.110
09 10 000 9901	03.92	09 15 000 6123	05.39	09 35 002 5411	06.37	09 45 100 1760	03.109
09 10 000 9902	03.92	09 15 000 6124	05.31	09 35 002 5411	06.38	09 45 100 1760	03.110
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09 10 000 9908	03.92	09 15 000 6126	05.31	09 35 012 0311	03.49	09 45 115 1104	03.94
09 10 000 9909	03.92	09 15 000 6126	05.39	09 35 012 0311	03.50	09 45 115 1106	03.94
		09 15 000 6221	05.31	09 35 012 0311	03.70	09 45 115 1520	03.96
		09 15 000 6221	05.39	09 35 012 0312	03.70	09 45 115 1522	03.96
09 10 004 3001	03.92	09 15 000 6222	05.31	09 35 012 0331	03.70	09 45 115 1560	03.95
09 10 004 3006	03.92	09 15 000 6222	05.39			09 45 115 1720	03.109
09 10 004 3101	03.92	09 15 000 6223	05.31	09 35 220 0401	03.73	09 45 115 1760	03.109
09 10 004 3106	03.92	09 15 000 6223	05.39	09 35 220 0402	03.73		
		09 15 000 6224	05.31	09 35 221 0401	03.65	09 45 125 1100	03.94
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09 10 008 3006	03.92	09 15 000 6225	05.31	09 35 221 0501	03.74	09 45 125 1300	03.109
09 10 008 3101	03.92	09 15 000 6225	05.39			09 45 125 1520	03.96
09 10 008 3106	03.92	09 15 000 6226	05.31	09 35 222 0401	03.65	09 45 125 1560	03.95
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		09 15 004 3013	05.31	09 35 225 0312	03.69		
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09 14 000 9915	05.33			09 35 225 0401	03.65	09 45 145 1521	03.78
		09 15 008 3013	05.33	09 35 225 0402	03.66	09 45 145 1521 XL	03.78
		09 15 008 3113	05.33	09 35 225 0403	03.66	09 45 145 1561	03.79
09 14 001 3011	05.39	09 15 503 0301	04.07	09 35 225 0421	03.64		
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09 14 001 4623	03.123	09 15 503 5411	04.05	09 35 226 0403	03.66	09 45 151 0023	03.40
09 14 001 4721	03.120	09 15 503 9911	04.05	09 35 226 0421	03.64	09 45 151 0024	03.40
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09 14 002 3061	05.36	09 20 003 0320	03.104	09 35 241 0401	06.37	09 45 151 1121	03.36
09 14 002 3101	05.31	09 20 003 0327	03.104	09 35 241 0402	06.37	09 45 151 1122	05.06
09 14 002 3101	05.33	09 20 003 5422	03.109	09 35 241 0421	06.35	09 45 151 1130	03.37
09 14 002 3161	05.34	09 20 003 5425	03.100	09 35 241 0422	06.35	09 45 151 1140	03.45
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09 14 008 3016	05.39	09 20 003 5449	03.113	09 35 242 0333	06.34	09 45 151 1520 XL	03.39
09 14 008 3017	05.39			09 35 242 0401	06.38	09 45 151 1524	03.40
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09 14 008 3116	05.39	09 35 000 9913	06.41			09 45 151 1560	03.38
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09 14 545 1120	03.122	09 35 002 0431	03.71	09 37 003 5405	03.100	09 45 151 1571	03.47
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09 14 881 1805	05.36	09 35 002 4003	06.34	09 45 100 1110	03.98	09 45 181 2563 XL	03.60
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09 47 030 4007	01.09	09 47 050 6026	01.07	09 47 474 7103	01.27	09 47 565 6044	01.15
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09 47 030 4026	01.09	09 47 050 6046	01.07	09 47 474 7107	01.27	09 47 565 6072	01.15
09 47 030 4027	01.09	09 47 050 6047	01.07	09 47 474 7108	01.27	09 47 565 6074	01.15
09 47 030 4029	01.09	09 47 050 6048	01.07	09 47 474 7109	01.27	09 47 565 6093	01.15
09 47 030 4045	01.09	09 47 050 6049	01.07	09 47 474 7110	01.27	09 47 565 6095	01.15
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09 47 030 4048	01.09	09 47 050 6068	01.07	09 47 474 7113	01.27	09 47 565 6104	01.15
09 47 030 4049	01.09	09 47 050 6069	01.07	09 47 474 7114	01.27	09 47 565 7033	01.15
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09 47 030 4067	01.09	09 47 050 6071	01.07	09 47 474 7116	01.27	09 47 565 7037	01.15
09 47 030 4068	01.09	09 47 050 6073	01.07	09 47 474 7117	01.27	09 47 565 7042	01.15
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		09 47 060 0026	01.11	09 47 474 7122	01.27	09 47 565 7072	01.15
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09 47 040 0026	01.11	09 47 060 0046	01.11	09 47 474 7143	01.27	09 47 565 7097	01.15
09 47 040 0027	01.11	09 47 060 0047	01.11	09 47 474 7144	01.27	09 47 565 7102	01.15
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09 47 040 0048	01.11	09 47 060 0068	01.11	09 47 474 7149	01.27	09 47 575 7003	01.39
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09 48 220 0011 010	05.08	09 48 474 7766 005	01.23	09 48 808 0011 100	05.09		
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09 48 284 7757 150	01.45	09 48 800 0011 100	05.09	09 48 932 3756 075	01.52	09 67 000 7476	05.41
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20 82 630 2100	01.13	21 03 030 1300	03.20	21 03 881 4805	05.26	21 33 232 3401 010	05.11
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20 82 631 1004	01.12					21 33 232 3401 030	05.11
20 82 631 1006	01.12	21 03 282 1405	03.07	21 03 882 1411	05.16	21 33 232 3401 050	05.11
20 82 631 1008	01.12	21 03 282 2405	03.07	21 03 882 2411	05.16	21 33 232 3401 100	05.11
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20 82 631 1030	01.12					21 33 290 0853 005	05.22
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20 82 631 1050	01.12	21 03 381 2401	03.20	21 33 010 1853 010	05.20	21 33 290 0853 020	05.22
20 82 631 1100	01.12	21 03 381 2403	03.20	21 33 010 1853 020	05.20	21 33 290 0853 025	05.22
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