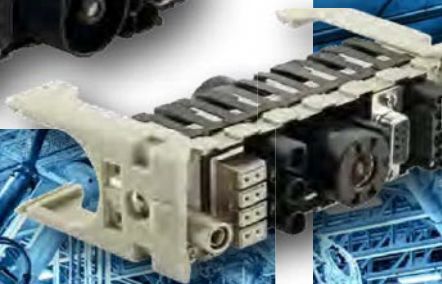


# heavy | mate®

## Heavy Duty Connectors



# Note from the CEO



Ladies and Gentlemen,

For over 75 years Amphenol has enjoyed success as the interconnection technology provider of choice to industry-leading companies around the world. One of our key strategic areas of focus has been and is the Industrial market. Our organization works with leading manufacturers across a wide range of applications - including Energy Generation & Distribution, Transportation, Heavy Equipment, Factory Automation, Wireless Outdoor, ChipCard Readers - enabling smarter, faster and better technologies to connect products to customer solutions.

The Industrial market footprint of Amphenol covers over facilities in more than 12 different European countries and more than 30 countries worldwide. Our successful expansion into new regions as well as new industrial applications is a direct reflection of our agile, entrepreneurial management team and our unwavering commitment to execute Amphenol's strategies for the benefit of our customers, shareholders and employees.

Thank you for partnering with Amphenol. Our entire organization is at your service.

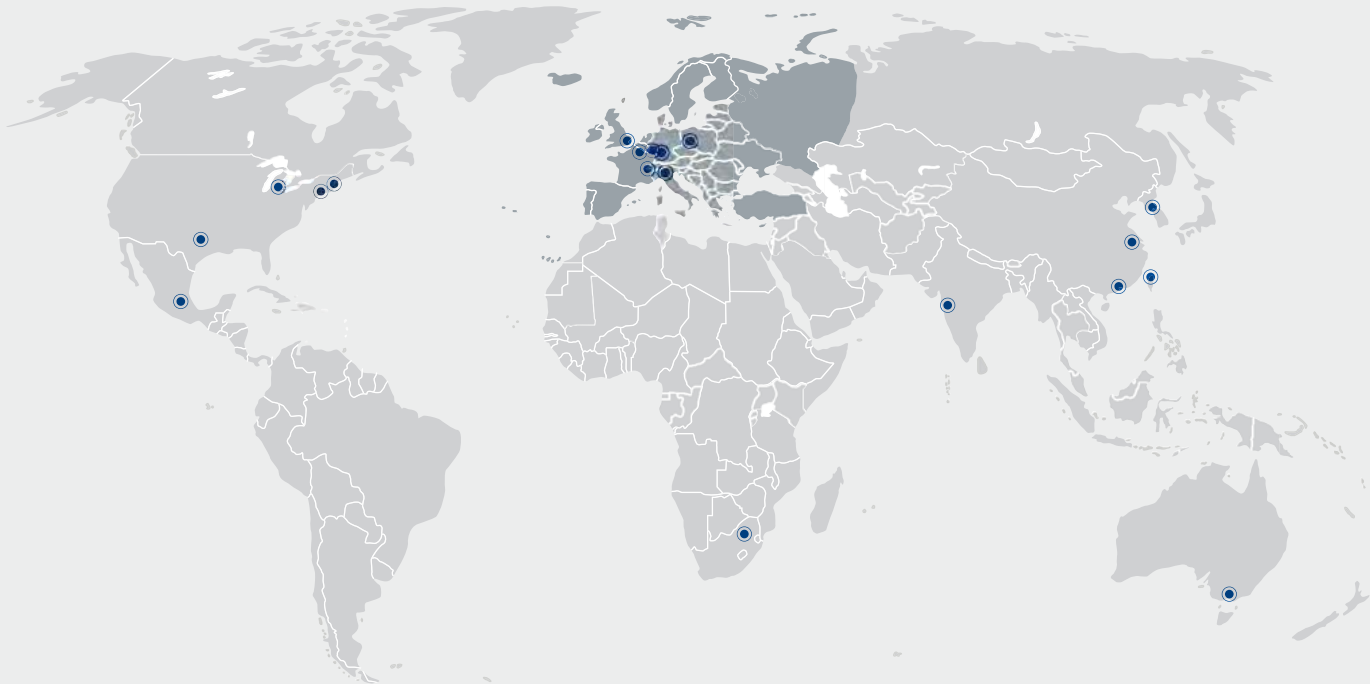
R. Adam Norwitt  
President and CEO, Amphenol Corporation

# Make use of the best Use our global resources

“Think global, act local!” Independently from where you are in Europe, we offer you our global expertise and great variety of products and technologies. And in comfort with your personal contact. Our numerous European offices are your access to our global resources.

OUR OFFICES IN EUROPE AND WORLDWIDE

|                |        |           |              |
|----------------|--------|-----------|--------------|
| FRANCE         | CHINA  | AUSTRALIA | SOUTH AFRICA |
| GERMANY        | KOREA  | MEXICO    | INDIA        |
| UNITED KINGDOM | TAIWAN | USA       | ITALY        |







SECURITY, RELIABILITY AND COMFORTABLE SERVICE FROM ONE SOURCE.

# More time for important things: benefit from our service and diversity

Enjoy security, reliability and comfortable service from one source. INDUSTRIAL@AMPHENOL offers one of the most individual and most diversified service programmes in the market – exclusively for industrial customers. Access all possibilities of the Amphenol group through your personal expert adviser.



## WIDE PRODUCT RANGE

Take advantage of a choice of Amphenol products. Our broad product portfolio offers individual solutions from more than 85 member companies in the global Amphenol group.



## EXCLUSIVENESS AND FLEXIBILITY

One face to the customer: every inquiry is handled on an individual service level by your personal key account service partner. This ensures maximum transparency and best-in-class flexibility in the whole process.



## QUALITY

Interconnect systems need reliability, speed and flawless data transmission. We continuously test and guarantee the required standard in our products – and also in our personal services.



## INDIVIDUAL SOLUTIONS

Your project requires an individual solution that is not available off-the-shelf? As your think tank and discussion partner we provide engineering support and solution-oriented development for your tailor-made Amphenol product.



## SPEED AND AVAILABILITY

Smart and intelligent processes are the secret behind our service programme. Flexible planning and distribution, perfect logistics and highest availability are our key factors for best customer service.



## GLOBAL KEY ACCOUNT SERVICE

Our key account service is your individual entrance to global know-how, products and services. More than 85 Amphenol companies around the world offer an extensive range of technologies and products. We offer access to our worldwide resources through one individual contact person.



# heavy|mate<sup>®</sup> is a Modular Metal Connector Line

## What is heavy|mate<sup>®</sup>?

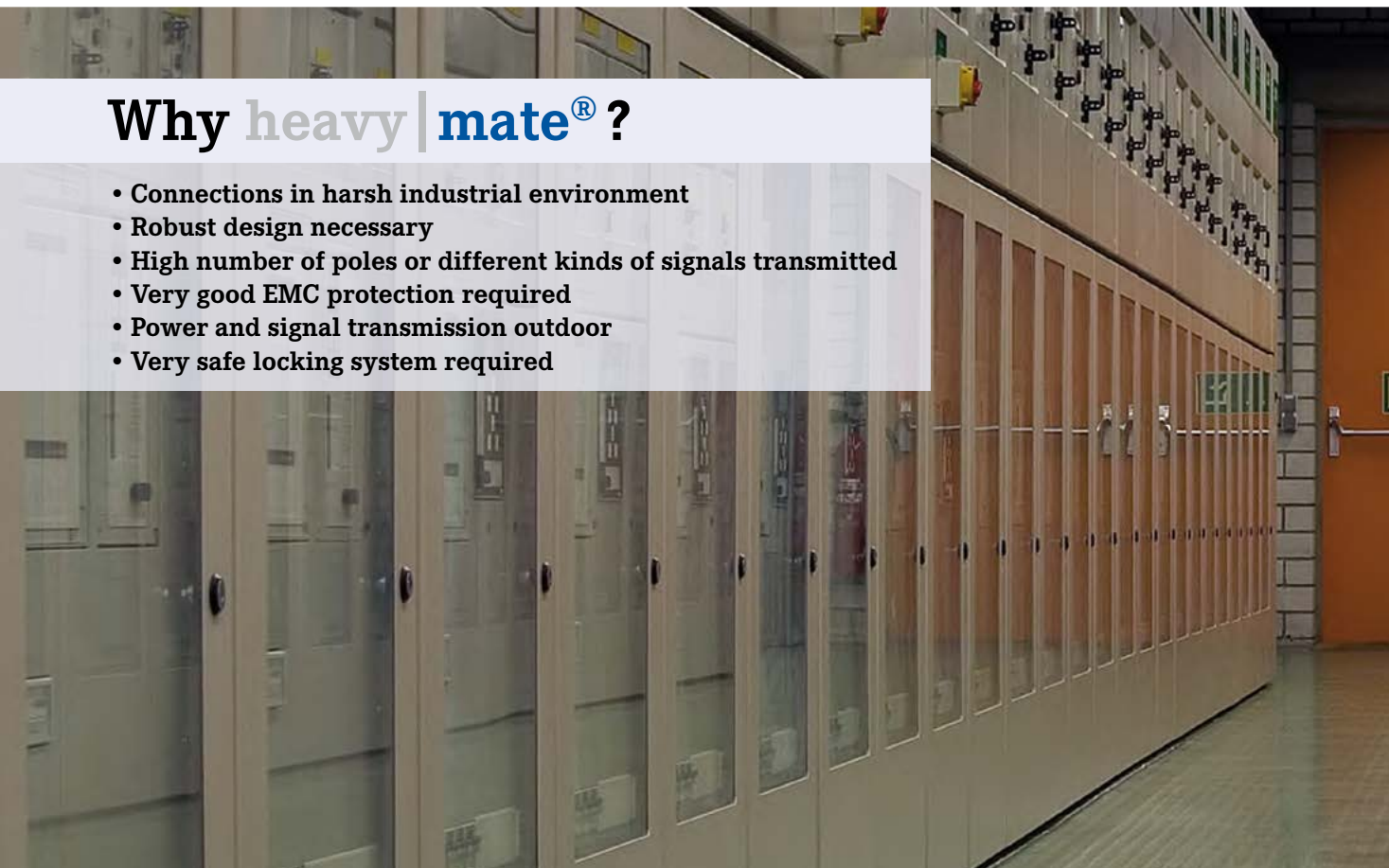
heavy|mate<sup>®</sup> is a modular connector line, consisting of:

- Hoods & Housings
- Inserts
- Contacts



## Why heavy|mate<sup>®</sup>?

- Connections in harsh industrial environment
- Robust design necessary
- High number of poles or different kinds of signals transmitted
- Very good EMC protection required
- Power and signal transmission outdoor
- Very safe locking system required



# for Applications in Industrial Environments.

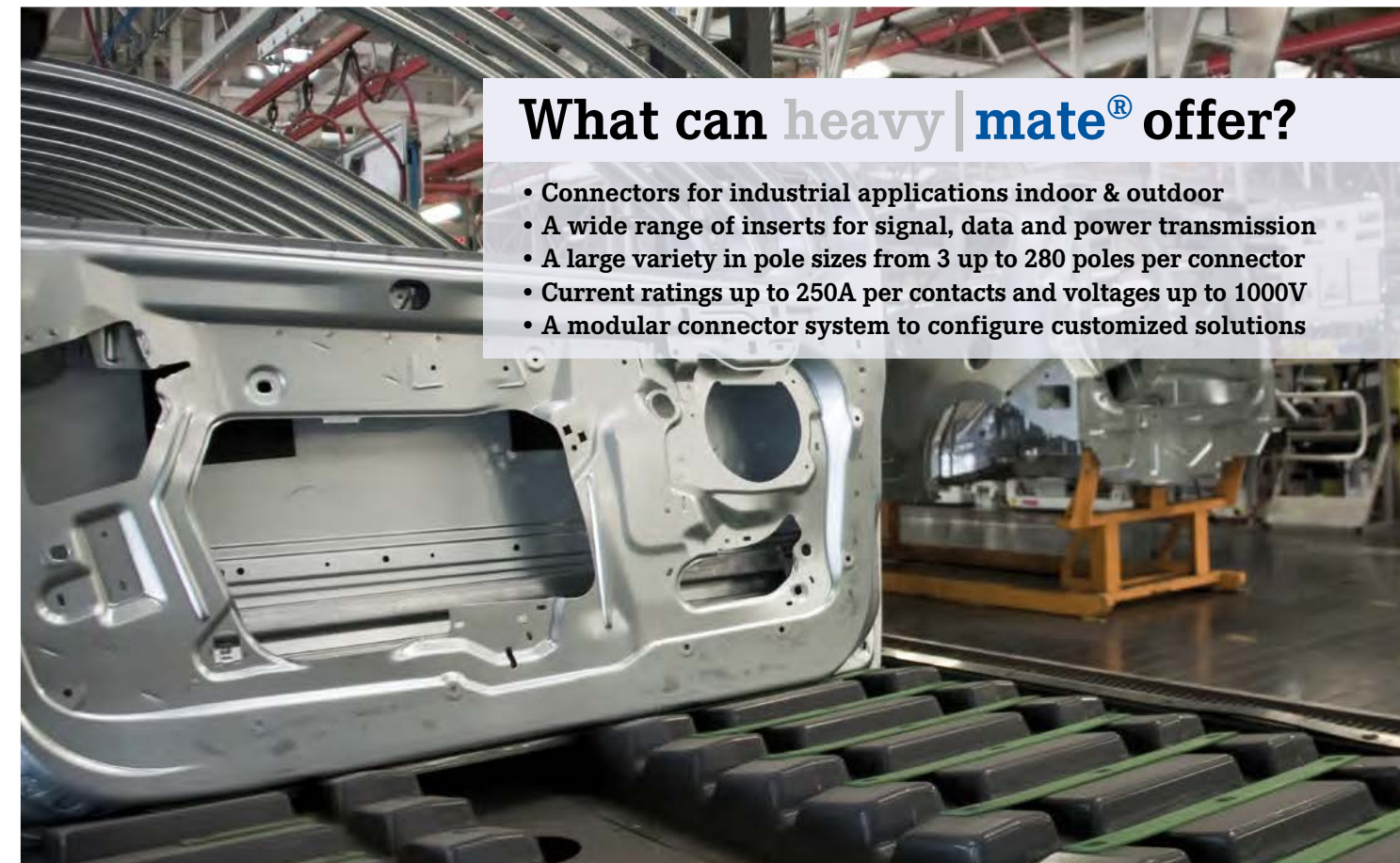
## Major product features

- Interconnections for power, signal and data
- Good costs
- Voltage up to 1000V
- VDE, UL, CSA approvals
- Vibration proof
- High pole sizes
- IP65 to IP69K
- Corrosion resistance
- Robust



## What can heavy|mate<sup>®</sup> offer?

- Connectors for industrial applications indoor & outdoor
- A wide range of inserts for signal, data and power transmission
- A large variety in pole sizes from 3 up to 280 poles per connector
- Current ratings up to 250A per contacts and voltages up to 1000V
- A modular connector system to configure customized solutions





# How to select a solution with series heavy | **mate**<sup>®</sup>.

## Theory

- Select an insert that meets your requirements.
- Choose the related contacts if not included in inserts.
- Choose related housings.
- Choose related cable gland.
- If you are interested in a cable assembly, please ask us.

## Practice 1

### Requirements

- 250V
- 5A
- 60 contacts
- Termination: crimp

### Solution

- Check: Make a pre-selection on the overview page of the series, s. p. 10/11  
Possible series: heavy | **mate**<sup>®</sup> D, DD and M
- Check: Details on the overview pages of the sub-series, see pages 22, 38, 154  
All 3 variants are possible; Selection heavy | **mate**<sup>®</sup> D
- Check: Contact inserts on the detail page of the sub-series  
Selection: C146 10A064 000 2
- Check: Contacts on the same double page  
Selection: VN01 016 0002 1
- Check: Housings via crosslink at contact inserts  
Selection: C146 21R024 600 8
- Check: Gland bushing via crosslink at housings  
Selection: VN16 320 0126X

## Practice 2

### Requirements

- 3 x 400V; 50A; 6mm<sup>2</sup> wire gauge
- 8 x 250V; 8A; 1.5mm<sup>2</sup> wire gauge
- 5 x 400V; 15A; 4mm<sup>2</sup> wire gauge

### Solution

- Check: Make a pre-selection on the overview page of the series, see pages 10/11  
Possible series: heavy | **mate**<sup>®</sup> M
- Check: How 16 contacts can be realized, see modules overview on page 130  
Possible selection: a) 1 x 20 contacts  
b) 2 x 10 contacts  
c) 1 x 10 contacts + 2 x 5 contacts  
d) 1 x 3 contacts + 1 x 5 contacts + 1 x 10 contacts
- Check: Technical parameters / solution, see detail pages of the modules on page 166  
Possible selection: a) not possible due to voltage  
b) not possible due to voltage  
c) not possible due to current  
d) POSSIBLE
- Check: Choose matching contact, see detail page of the modules on page 166  
Possible selection: a) C146 A03 001 E8 – VN01 036 0002 1C  
b) C146 A05 001 E8 – VN01 025 0033 1C  
c) C146 A10 001 E8 – VN01 016 0027 1C
- Check: Choose matching frame, see frames on page 166  
Solution: C146 P10 001 G8
- Check: Choose matching housing, see housings on page 214  
Solution: C146 21R010 600 8



Make your selection out of the heavy|mate® series!

| Characteristic<br>Series | Voltage |      |      |      |      |       | Current |     |     |     |      |      |
|--------------------------|---------|------|------|------|------|-------|---------|-----|-----|-----|------|------|
|                          | 250V    | 400V | 500V | 690V | 830V | 1000V | 10A     | 16A | 35A | 80A | 100A | 200A |
| A<br>(page 14)           | ●       | ●    |      |      |      |       | ●       | ●   |     |     |      |      |
| D<br>(page 22)           | ●       |      |      |      |      |       | ●       |     |     |     |      |      |
| DD<br>(page 38)          | ●       |      |      |      |      |       | ●       |     |     |     |      |      |
| E<br>(page 44)           | ●       | ●    | ●    |      |      |       | ●       | ●   |     |     |      |      |
| EE<br>(page 62)          | ●       | ●    | ●    |      |      |       | ●       | ●   |     |     |      |      |
| EEE<br>(page 68)         | ●       | ●    | ●    |      |      |       | ●       | ●   |     |     |      |      |
| E / FE / KO<br>(page 74) | ●       | ●    |      |      |      |       | ●       |     |     |     |      |      |
| F<br>(page 80)           | ●       | ●    | ●    | ●    | ●    | ●     | ●       | ●   | ●   | ●   | ●    | ●    |
| HSE<br>(page 132)        | ●       | ●    |      |      |      |       | ●       | ●   | ●   |     |      |      |
| HvE<br>(page 136)        | ●       | ●    | ●    | ●    |      |       | ●       | ●   |     |     |      |      |
| K<br>(page 144)          | ●       | ●    | ●    | ●    | ●    |       | ●       | ●   | ●   | ●   |      |      |
| M<br>(page 154)          | ●       | ●    | ●    | ●    | ●    | ●     | ●       | ●   | ●   | ●   | ●    | ●    |
| Q<br>(page 198)          | ●       | ●    | ●    | ●    |      |       | ●       | ●   | ●   |     |      |      |

| Number of contacts                                  |  | Termination |       |                |         | Characteristic<br>Series |             |
|-----------------------------------------------------|--|-------------|-------|----------------|---------|--------------------------|-------------|
|                                                     |  | Crimp       | Screw | Tension spring | Push in |                          |             |
| 3 / 4 / 10 / 16                                     |  |             | ●     |                |         | A<br>(page 14)           | A           |
| 7 / 8 / 15 / 25 / 40 / 64                           |  | ●           |       |                |         | D<br>(page 22)           | D           |
| 24 / 42 / 72 / 108                                  |  | ●           |       |                |         | DD<br>(page 38)          | DD          |
| 6 / 10 / 16 / 24                                    |  | ●           | ●     | ●              | ●       | E<br>(page 44)           | E           |
| 10 / 18 / 32 / 46                                   |  | ●           |       |                |         | EE<br>(page 62)          | EE          |
| 40 / 64                                             |  | ●           |       |                |         | EEE<br>(page 68)         | EEE         |
| 6 / 10 / 16 / 24                                    |  |             | ●     |                |         | E / FE / KO<br>(page 74) | E / FE / KO |
| 1 / 2 / 3 / 4 / 6 / 7 / 2x4 / 8 / 12 / 17 / 20 / 36 |  | ●           |       |                |         | F<br>(page 80)           | F           |
| 6                                                   |  |             | ●     |                |         | HSE<br>(page 132)        | HSE         |
| 3+2 / 6+2 / 10+2 / 16+2                             |  |             | ●     |                |         | HvE<br>(page 136)        | HvE         |
| 4/0 / 4/2 / 6/36 / 4/8 / 8/24                       |  | ●           | ●     |                |         | K<br>(page 144)          | K           |
| 1 / 2 / 3 / 4 / 5 / 10 / 20 / 2x4                   |  | ●           |       |                | ●       | M<br>(page 154)          | M           |
| 5 / 4/2 / 7 / 8 / 12 / 17                           |  | ●           |       |                |         | Q<br>(page 198)          | Q           |



# The highlights of the series heavy|mate®.

## Contact technology

- Turned contacts, which correspond to the market standard.
- Turned female contacts of copper for higher current-carrying capacity – specifically for the modular system heavy|mate® M.
- Radsok contact technology: These are laminated contacts with very low transition resistance, suitable for high current applications.
- Stamped contacts with high performance for semi-automatic processing at great cost savings.
- Selectively coated gold plating stamped contacts offer great savings.



## Housings

Surface coatings available in two versions: Standard or High-End with a salt mist resistance up to 500 hours.

Flexible cable entry in different positions – possible on request.

Tightness classes in IP65, IP67 or IP68 or IP69K!

Robust metal levers in 1 and 2 locking-lever-system.

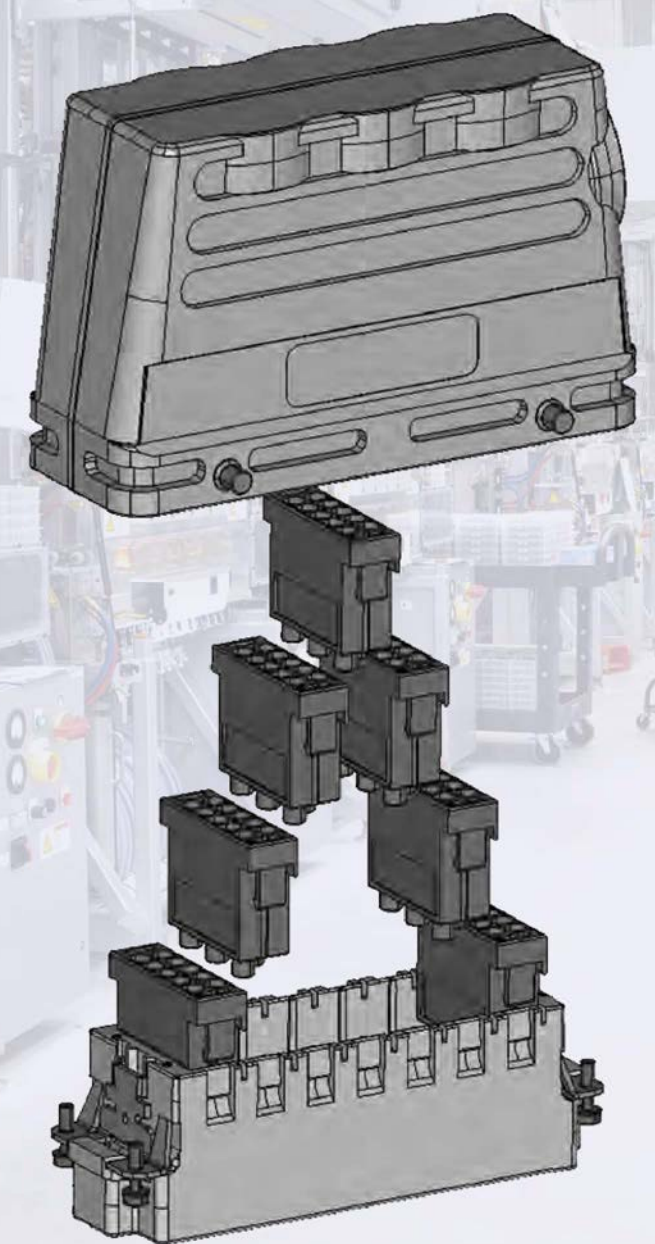
Quality EMC solutions.



## Modular system

With the new series heavy|mate® F Amphenol offers a new modular system that is compatible with the market leader. With the series heavy|mate® M Amphenol offers a system with many benefits:

- More module slots in the connector.
- Large selection of contact-safe male contacts
- Stamped contacts and the Radsok contact technology
- Great cost savings potential







# heavy | mate® A

- Rated voltage 250 / 400 V
- Rated current 10 A ... 16 A
- Termination: screw
- Number of contacts: 3, 4, 10, 16, 32

## heavy | mate® A Brief information



| Approvals, Testhouse                                                                        | Characteristics | Approval-Number |
|---------------------------------------------------------------------------------------------|-----------------|-----------------|
| UL<br> | 600 V           | E 63093         |



General information

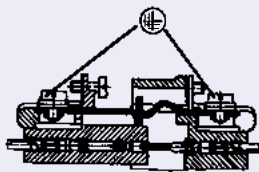
- For series heavy|mate® A connectors may be engaged or disengaged when live but without electrical load.  
If these connectors are used as plug and socket device, the load shall be reduced to 10 % of the rated current.
- Low and high profile housing for heavy|mate® A series inserts for 10 and 16 contacts.



No standard for this series, but:

- Interchangeable with other makes
    - a) contact insert to contact insert
    - b) contact insert to housing 10 & 16 contacts
- Housings are designed according to DIN EN 175 301 - 801

First-to-mate last-to-break protective ground contact



Range of housings

Size A3/4



Size A10



Size A16



| General Characteristics                             | Standard        | Value                                                    |                                          |        |        |
|-----------------------------------------------------|-----------------|----------------------------------------------------------|------------------------------------------|--------|--------|
| Number of contacts                                  |                 | 3/4 + ☺                                                  | 10 + ☺                                   | 16 + ☺ | 32 + ☺ |
| Termination technique                               |                 | screw                                                    |                                          |        |        |
| Wire gauge                                          |                 | 0.5 – 1.5 mm <sup>2</sup><br>(AWG 20 – 16) <sup>1)</sup> | 0.5-2.5 mm <sup>2</sup><br>(AWG 20 – 14) |        |        |
| Tightening torque                                   |                 | 0.3 Nm                                                   | 0.5 Nm                                   |        |        |
| Max. wire diameter                                  |                 | 3.6 mm                                                   | 4.6 mm                                   |        |        |
| Flammability                                        | UL 94           | V-0                                                      |                                          |        |        |
| Electrical Characteristics                          |                 |                                                          |                                          |        |        |
| Rated voltage                                       | IEC 60664-1     | 230 V (L-E)<br>400 V (E-E)<br>(UL 600 V)                 | 250 V<br>(UL 600 V)                      |        |        |
| Rated impulse withstand voltage                     | IEC 60664-1     | 4 kV                                                     |                                          |        |        |
| Rated Current T <sub>amp</sub> = 40 °C              |                 | 10 A                                                     | 16 A                                     |        |        |
| Current carrying capacity                           | IEC 60512-5-2   | see derating curves                                      |                                          |        |        |
| Installation (overvoltage) category                 | IEC 60664-1     | III                                                      |                                          |        |        |
| Material group                                      | IEC 60664-1     | III b                                                    |                                          |        |        |
| Contact resistance                                  | IEC 60512-2-1   | ≤ 5 m Ω                                                  |                                          |        |        |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                     |                                          |        |        |
| Pollution degree                                    | IEC 60664-1     | 3                                                        |                                          |        |        |
| Climatical Characteristics                          |                 |                                                          |                                          |        |        |
| Climatic category                                   | IEC 60068-1     | 40 / 125 / 21                                            |                                          |        |        |
| Upper temperature                                   | IEC 60512-11-9  | + 125 °C                                                 |                                          |        |        |
| Lower temperature                                   | IEC 60512-11-10 | - 40 °C                                                  |                                          |        |        |
| Mechanical Characteristics                          |                 |                                                          |                                          |        |        |
| IP-degree of protection pin insert <sup>2)</sup>    | IEC 60529       | unmated IP00, mated IP20                                 |                                          |        |        |
| IP-degree of protection socket insert <sup>2)</sup> | IEC 60529       | unmated IP20, mated IP20                                 |                                          |        |        |
| Weight pin insert                                   |                 | 13 g                                                     | 48 g                                     | 68 g   | 136 g  |
| Weight socket insert                                |                 | 13 g                                                     | 52 g                                     | 73 g   | 146 g  |
| Mechanical operation                                | IEC 60512-9-1   | ≥ 500 mating cycles                                      |                                          |        |        |
| Materials                                           |                 |                                                          |                                          |        |        |
| Insert                                              |                 | PA                                                       |                                          |        |        |
| Colour insert                                       |                 | Grey                                                     |                                          |        |        |
| Contacts                                            |                 | CuZn (brass)                                             |                                          |        |        |
| Contact plating                                     |                 | Ag (silver)                                              |                                          |        |        |

A

<sup>1)</sup> up to 2.5 mm² without wire end sleeve  
<sup>2)</sup> IP-degree of protection on termination side of screw version IP10



| Description                            | Part Number       | Drawing | Figure |
|----------------------------------------|-------------------|---------|--------|
| <b>Contact insert 3 + ⊕</b>            |                   |         |        |
| Pin insert<br>for screw termination    | C146 10A003 002 4 |         |        |
| Socket insert<br>for screw termination | C146 10B003 002 4 |         |        |

Pin layout

Pin insert

Socket insert

| Description                            | Part Number       | Drawing | Figure |
|----------------------------------------|-------------------|---------|--------|
| <b>Contact insert 4 + ⊕</b>            |                   |         |        |
| Pin insert<br>for screw termination    | C146 10A004 002 4 |         |        |
| Socket insert<br>for screw termination | C146 10B004 002 4 |         |        |

Pin layout

Pin insert

Socket insert



| Description                                                    | Part Number       | Drawing | Figure |
|----------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 10 + ⊕</b>                                   |                   |         |        |
| Pin insert<br>for screw termination                            | C146 10A010 002 4 |         |        |
| Pin insert<br>with wire protection<br>for screw termination    | C146 10A010 102 4 |         |        |
| Socket insert<br>for screw termination                         | C146 10B010 002 4 |         |        |
| Socket insert<br>with wire protection<br>for screw termination | C146 10B010 102 4 |         |        |

Pin layout

Pin insert

Socket insert

Assembly instruction

Panel cut out (insert)





| Description                                                    | Part Number       | Drawing | Figure |
|----------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 16 + ⊕</b>                                   |                   |         |        |
| Pin insert<br>for screw termination                            | C146 10A016 002 4 |         |        |
| Pin insert<br>with wire protection<br>for screw termination    | C146 10A016 102 4 |         |        |
| Socket insert<br>for screw termination                         | C146 10B016 002 4 |         |        |
| Socket insert<br>with wire protection<br>for screw termination | C146 10B016 102 4 |         |        |

Pin insert

Socket insert

Assembly instruction

Panel cut out (insert)



| Description                                                    | Part Number                                                    | Drawing | Figure |
|----------------------------------------------------------------|----------------------------------------------------------------|---------|--------|
| <b>Contact insert 32 + ⊕</b>                                   |                                                                |         |        |
| Pin insert<br>for screw termination                            | C146 10A016 002 4 (1 - 16)<br>+<br>C146 10A016 004 4 (17 - 32) |         |        |
| Pin insert<br>with wire protection<br>for screw termination    | C146 10A016 102 4 (1 - 16)<br>+<br>C146 10A016 104 4 (17 - 32) |         |        |
| Socket insert<br>for screw termination                         | C146 10B016 002 4 (1 - 16)<br>+<br>C146 10B016 004 4 (17 - 32) |         |        |
| Socket insert<br>with wire protection<br>for screw termination | C146 10B016 102 4 (1 - 16)<br>+<br>C146 10B016 104 4 (17 - 32) |         |        |

Pin insert

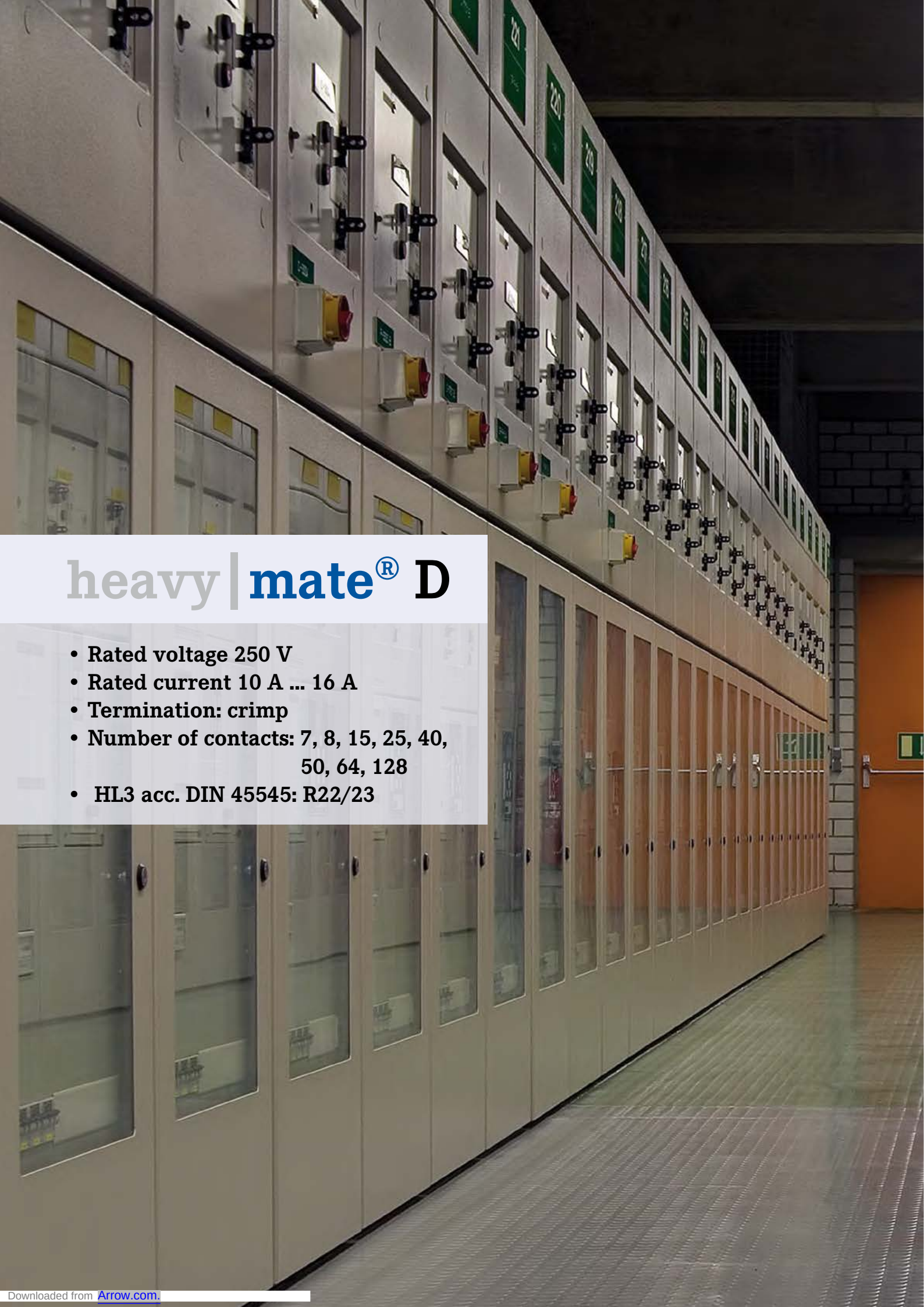
Socket insert

Assembly instruction

Panel cut out (insert)







# heavy|mate<sup>®</sup> D

- Rated voltage 250 V
- Rated current 10 A ... 16 A
- Termination: crimp
- Number of contacts: 7, 8, 15, 25, 40, 50, 64, 128
- HL3 acc. DIN 45545: R22/23

## heavy|mate<sup>®</sup> D Brief information



| Approvals, Testhouse |                                                                                       | Characteristics | Approval-Number |
|----------------------|---------------------------------------------------------------------------------------|-----------------|-----------------|
| UL                   |  | 600 V           | E 63093         |
| CSA                  |  | 600 V           | 48932           |



General information

- Contact inserts without crimp contacts, crimping tools see separate catalogue „Tools“.
- Contacts must be ordered separately, processing instructions see catalogue „Tools“.
- We recommend using the high profile housings / hoods for the heavy|mate® D inserts.
- Connectors series heavy|mate® D may be engaged or disengaged when live but without electrical load.  
If these connectors are mated or unmated under load, the load shall be reduced to 10 % of the rated current.
- For contact inserts for turned contacts, guide pins and guide socket are recommended (see page 290).
- By using contact inserts with two PE-connections without hoods, it is necessary to connect the facing of each PE-connection.
- If connectors are mounted in non conductive housings both protective earthing terminals shall be mounted.



Standardised connectors according to DIN EN 175 301 - 801 (DIN 43652)

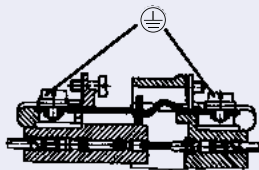
Interchangeable with all other products which are according to the standard.

- a) Contact insert to contact insert 15-, 25-, 40-, 64- way
- b) Contact insert to housing 15-, 25-, 40-, 64- way

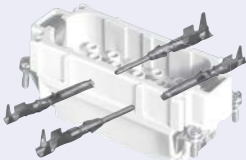
High protection against mismatching

First-to-mate last-to-break protective ground contact

- Socket inserts with funnel shaped contact entry avoids mismatching with stamped contacts.



Contact inserts for stamped contacts and for turned contacts



Range of housings

Size A3/4



Size A10



Size A16



Size E16



Size E24

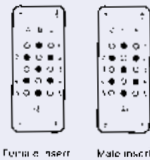


Size E48



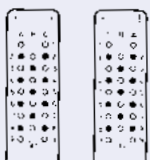
Modified contact arrangement for rated voltages of 400 V

(15) → 7 + ⊕



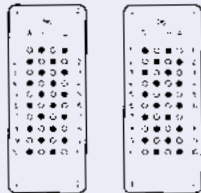
Female insert Male insert

(25) → 11 + ⊕



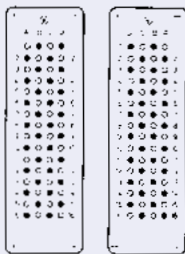
Female insert Male insert

(40) → 20 + ⊕



Female insert Male insert

(64) → 32 + ⊕



Female insert Male insert

- full load contact
- unoccupied

Removal of contacts, front releas

stamped pin contacts  
all turned contacts



stamped socket contacts

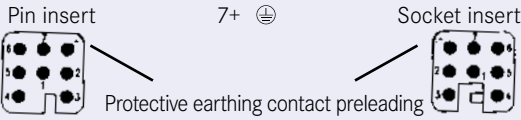




| General Characteristics               | Standard                       | Value                                                                                         |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
|---------------------------------------|--------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--|
| Number of contacts                    |                                | 7+ <br>8-Pol | 15<br>+  | 25<br>+  | 40<br>+  | 50+ <br>2x25 | 64<br>+  | 128<br>+ <br>2x64 |  |
| Contact arrangement                   | DIN EN 175 301-801 (DIN 43652) |                                                                                               | •                                                                                         | •                                                                                         | •                                                                                         |                                                                                               | •                                                                                         |                                                                                                    |  |
| Termination technique                 |                                | crimp                                                                                         |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Wire gauge                            |                                | 0.14 mm <sup>2</sup> - 2.5 mm <sup>2</sup><br>(AWG 26 - 14)                                   |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Max. wire diameter                    |                                | 4.1 mm                                                                                        |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Flammability                          | UL 94                          | V-0                                                                                           |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Electrical Characteristics            |                                |                                                                                               |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Rated voltage <sup>1)</sup>           | IEC 60664-1                    | 250 V (400 V~ <sup>2)</sup> ) (UL/CSA 600V) <sup>1)</sup>                                     |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Rated impulse withstand voltage       | IEC60664-1                     | 4 kV                                                                                          |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Rated Current T <sub>u</sub> = 40 °C  |                                | 16 A                                                                                          | 10 A                                                                                      |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Current carrying capacity             | IEC 60512-5-2                  | see derating curves                                                                           |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Installation (overvoltage) category   | IEC 60664-1                    | III                                                                                           |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Material group                        | IEC 60664-1                    | III a                                                                                         |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Contact resistance                    |                                | ≥ 5 m Ω                                                                                       |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Insulation resistance                 | IEC 60512-3-1                  | ≥ 10 <sup>10</sup> Ω                                                                          |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Pollution degree                      | IEC 60664-1                    | 3                                                                                             |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Climatical Characteristics            |                                |                                                                                               |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Climatic category                     | IEC 60068-1                    | 40/125/21                                                                                     |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Upper temperature                     | IEC 60512-11-9                 | + 125°C                                                                                       |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Lower temperature                     | IEC 60512-11-10                | - 40°C                                                                                        |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Mechanical Characteristics            |                                |                                                                                               |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| IP-degree of protection pin insert    | IEC 60529                      | unmated IP00, mated IP20                                                                      |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| IP-degree of protection socket insert | IEC 60529                      | unmated IP20, mated IP20                                                                      |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Weight pin insert                     |                                | 8 g                                                                                           | 28 g                                                                                      | 34 g                                                                                      | 53 g                                                                                      | 68 g                                                                                          | 65 g                                                                                      | 130 g                                                                                              |  |
| Weight socket insert                  |                                | 8 g                                                                                           | 30 g                                                                                      | 38 g                                                                                      | 64 g                                                                                      | 76 g                                                                                          | 82 g                                                                                      | 164 g                                                                                              |  |
| Mechanical operation                  | IEC 60512-9-1                  | ≥ 500 mating cycles                                                                           |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Materials                             |                                |                                                                                               |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Insert                                | IEC 60664-1                    | PBT                                                                                           | PC                                                                                        |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Colour insert                         | IEC 60664-1                    | grey                                                                                          |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Contacts                              |                                | CuZn (Messing)                                                                                |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |
| Contact plating                       |                                | Ag (Silber) / Au (Gold)                                                                       |                                                                                           |                                                                                           |                                                                                           |                                                                                               |                                                                                           |                                                                                                    |  |

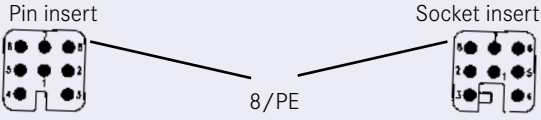
| Description                                 | Part Number       | Drawing | Figure |
|---------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 7 + ④</b>                 |                   |         |        |
| Pin insert<br>for stamped crimp contacts    | C146 10A007 000 2 |         |        |
| Socket insert<br>for turned crimp contacts  | C146 10A007 500 2 |         |        |
| Socket insert<br>for stamped crimp contacts | C146 10B007 000 2 |         |        |
| Socket insert<br>for turned crimp contacts  | C146 10B007 500 2 |         |        |

Pin layout

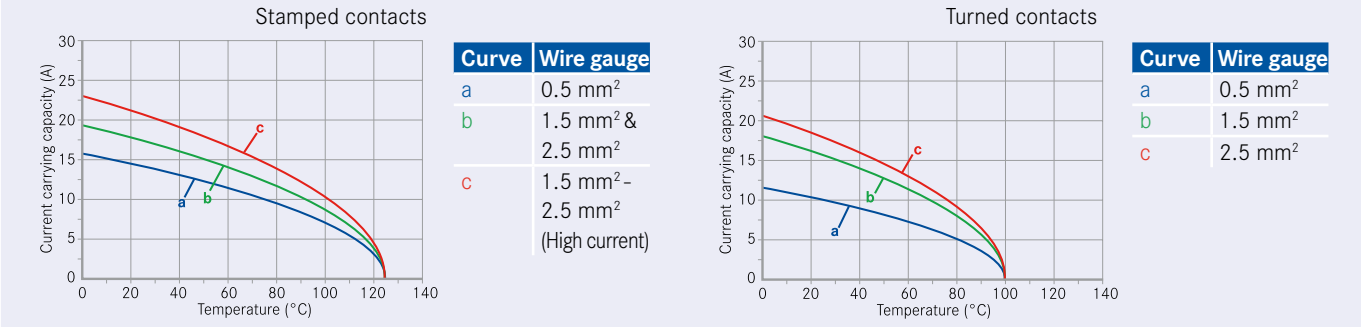


| Description                                                                                                                               | Part Number       | Drawing | Figure |
|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 8 contacts, 42 V~ in metal housings/250 V in thermoplastic housings (Please order contacts separately, see page 34)</b> |                   |         |        |
| Pin insert<br>for stamped crimp contacts                                                                                                  | C146 10A008 000 2 |         |        |
| Pin insert<br>for turned crimp contacts                                                                                                   | C146 10A008 500 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                                                                               | C146 10B008 000 2 |         |        |
| Socket insert<br>for turned crimp contacts                                                                                                | C146 10B008 500 2 |         |        |

Pin layout (Note: For use up to 42 V~, the PE contact can be used as regular contact.)



Derating curves





| Description                                                                                      | Part Number       | Drawing | Figure |
|--------------------------------------------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 15 + ⊕ (Please order contacts separately, see page 34)</b>                     |                   |         |        |
| Pin insert<br>for stamped crimp contacts                                                         | C146 10A015 000 2 |         |        |
| Pin insert<br>for turned crimp contacts                                                          | C146 10A015 500 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                                      | C146 10B015 000 2 |         |        |
| Socket insert<br>for turned crimp contacts                                                       | C146 10B015 500 2 |         |        |
| <b>Contact insert 15 + ⊕, 2 x PE-termination (Please order contacts separately, see page 34)</b> |                   |         |        |
| Pin insert<br>for stamped crimp contacts                                                         | C146 10A015 060 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                                      | C146 10B015 060 2 |         |        |

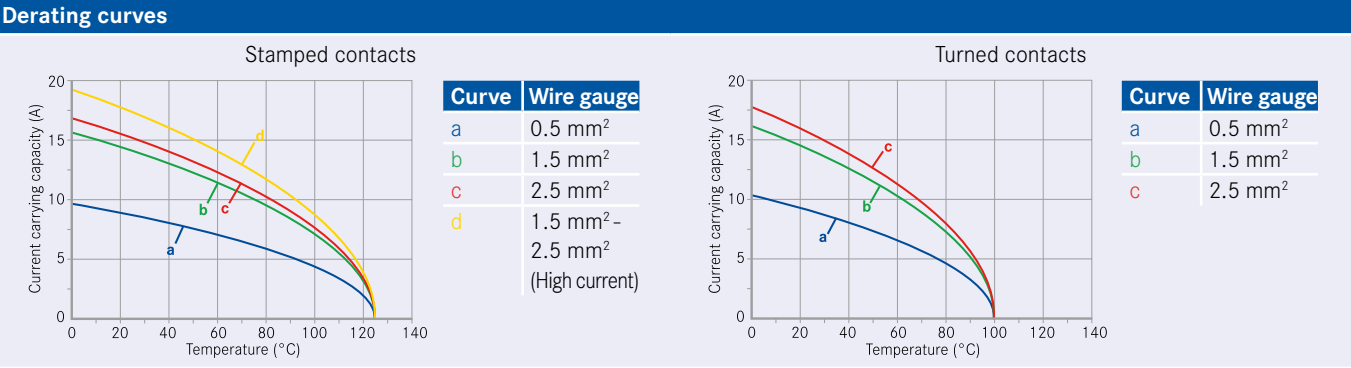
Pin layout

Assembly instruction

Pin insert

Socket insert

Panel cut out (insert)



| Description                                                                                      | Part Number       | Drawing | Figure |
|--------------------------------------------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 25 + ⊕ (Please order contacts separately, see page 34)</b>                     |                   |         |        |
| Pin insert<br>for stamped crimp contacts                                                         | C146 10A025 000 2 |         |        |
| Pin insert<br>for turned crimp contacts                                                          | C146 10A025 500 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                                      | C146 10B025 000 2 |         |        |
| Socket insert<br>for turned crimp contacts                                                       | C146 10B025 500 2 |         |        |
| <b>Contact insert 25 + ⊕, 2 x PE-termination (Please order contacts separately, see page 34)</b> |                   |         |        |
| Pin insert<br>for stamped crimp contacts                                                         | C146 10A025 060 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                                      | C146 10B025 060 2 |         |        |

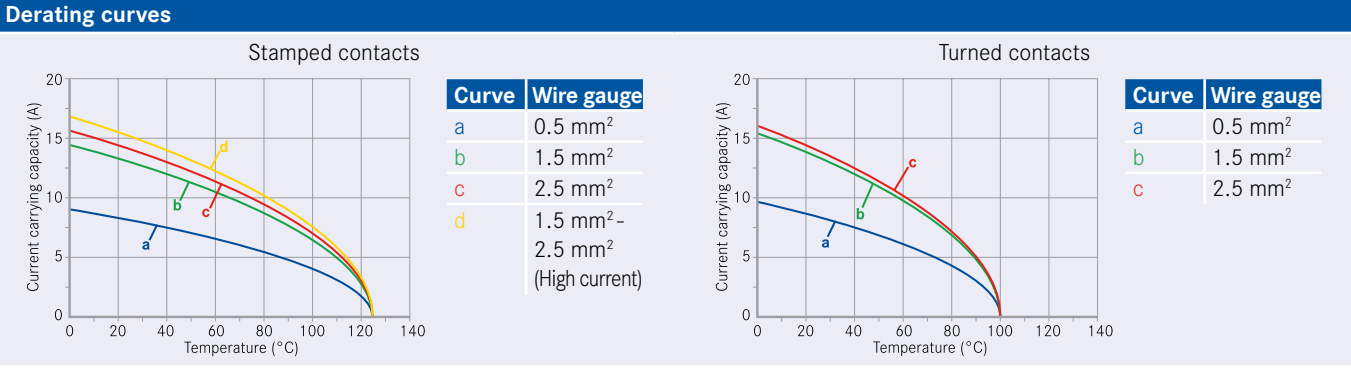
Pin layout

Assembly instruction

Pin insert

Socket insert

Panel cut out (insert)





| Description                                                                                      | Part Number       | Drawing | Figure |
|--------------------------------------------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 40 + ⊕ (Please order contacts separately, see page 34)</b>                     |                   |         |        |
| Pin insert<br>for stamped crimp contacts                                                         | C146 10A040 000 2 |         |        |
| Pin insert<br>for turned crimp contacts                                                          | C146 10A040 500 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                                      | C146 10B040 000 2 |         |        |
| Socket insert<br>for turned crimp contacts                                                       | C146 10B040 500 2 |         |        |
| <b>Contact insert 40 + ⊕, 2 x PE-termination (Please order contacts separately, see page 34)</b> |                   |         |        |
| Pin insert<br>for stamped crimp contacts                                                         | C146 10A040 060 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                                      | C146 10B040 060 2 |         |        |

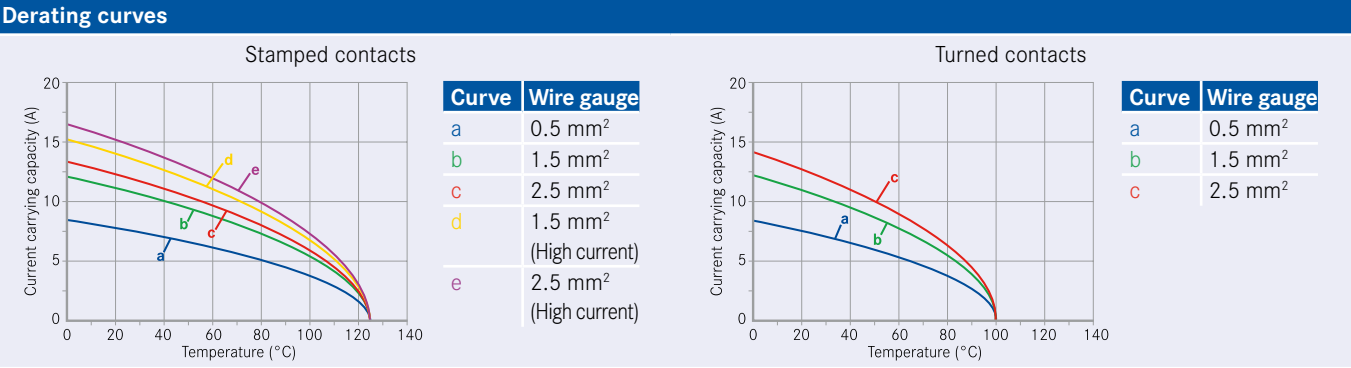
Pin layout

Pin insert

Socket insert

Assembly instruction

Panel cut out (insert)



| Description                                                                  | Part Number                                 | Drawing | Figure |
|------------------------------------------------------------------------------|---------------------------------------------|---------|--------|
| <b>Contact insert 50 + ⊕ (Please order contacts separately, see page 34)</b> |                                             |         |        |
| Pin insert<br>for stamped crimp contacts                                     | C146 10A025 000 2<br>+<br>C146 10A025 005 2 |         |        |
| Pin insert<br>for turned crimp contacts                                      | C146 10A025 500 2<br>+<br>C146 10A025 505 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                  | C146 10B025 000 2<br>+<br>C146 10B025 005 2 |         |        |
| Socket insert<br>for turned crimp contacts                                   | C146 10B025 500 2<br>+<br>C146 10B025 505 2 |         |        |

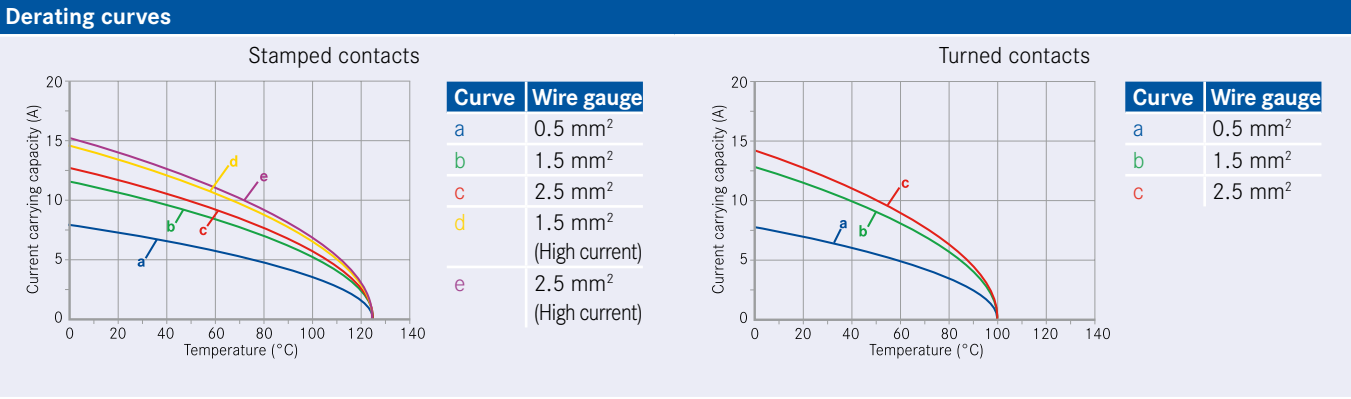
Pin layout

Pin insert

Socket insert

Assembly instruction

Panel cut out (insert)

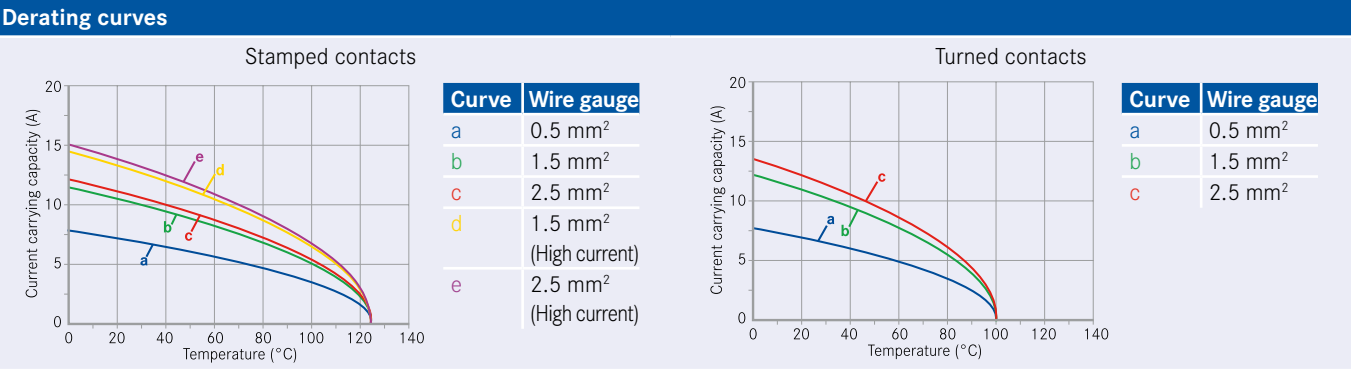




| Description                                                                  | Part Number       | Drawing | Figure |
|------------------------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 64 + ⊕ (Please order contacts separately, see page 34)</b> |                   |         |        |
| Pin insert<br>for stamped crimp contacts                                     | C146 10A064 000 2 |         |        |
| Pin insert<br>for turned crimp contacts                                      | C146 10A064 500 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                  | C146 10B064 000 2 |         |        |
| Socket insert<br>for turned crimp contacts                                   | C146 10B064 500 2 |         |        |

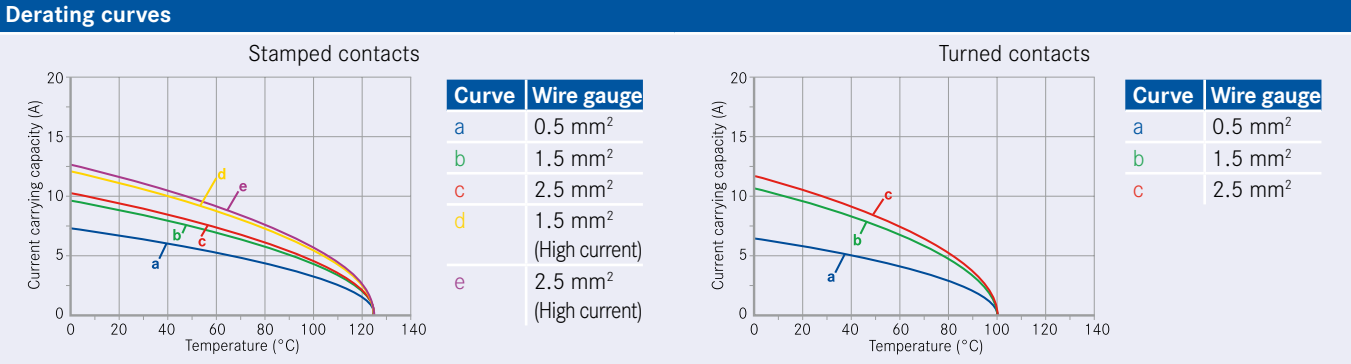
|                                                                                                  |                   |  |  |
|--------------------------------------------------------------------------------------------------|-------------------|--|--|
| <b>Contact insert 64 + ⊕, 2 x PE-termination (Please order contacts separately, see page 34)</b> |                   |  |  |
| Pin insert<br>for stamped crimp contacts                                                         | C146 10A064 060 2 |  |  |
| Socket insert<br>for stamped crimp contacts                                                      | C146 10B064 060 2 |  |  |

| Pin layout |               | Assembly instruction   |  |
|------------|---------------|------------------------|--|
| Pin insert | Socket insert | Panel cut out (insert) |  |
|            |               |                        |  |



| Description                                                                   | Part Number                                 | Drawing | Figure |
|-------------------------------------------------------------------------------|---------------------------------------------|---------|--------|
| <b>Contact insert 128 + ⊕ (Please order contacts separately, see page 34)</b> |                                             |         |        |
| Pin insert<br>for stamped crimp contacts                                      | C146 10A064 000 2<br>+<br>C146 10A064 005 2 |         |        |
| Pin insert<br>for turned crimp contacts                                       | C146 10A064 500 2<br>+<br>C146 10A064 505 2 |         |        |
| Socket insert<br>for stamped crimp contacts                                   | C146 10B064 000 2<br>+<br>C146 10B064 005 2 |         |        |
| Socket insert<br>for turned crimp contacts                                    | C146 10B064 500 2<br>+<br>C146 10B064 505 2 |         |        |

| Pin layout |               | Assembly instruction   |  |
|------------|---------------|------------------------|--|
| Pin insert | Socket insert | Panel cut out (insert) |  |
|            |               |                        |  |





Large range of wire gauges

VN01 016 0003 1C

VN01 016 0002 1C

VN01 016 0005 1C

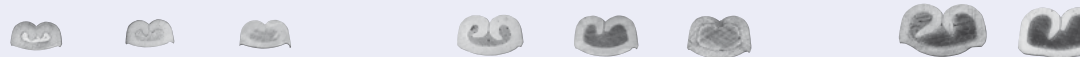


Gas-tight (coldwelding)

0.140.250.5

0.51.01.5

1.52.5



Stamped crimp contacts with insulation crimp, to absorb mechanical stress from the crimped connection

Insulation grip



Mechanical retention spring stop on Socket and Pin contact

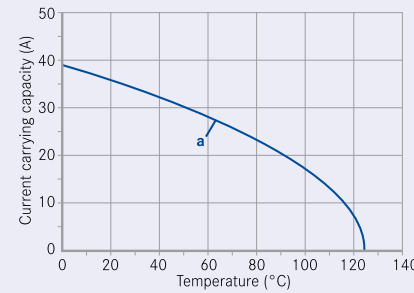
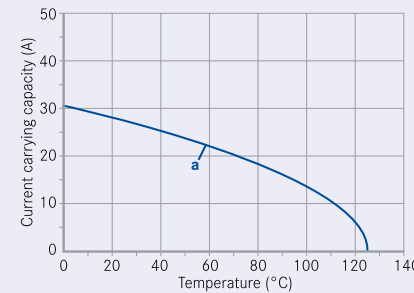
Socket contact

Pin contact



High current carrying capacity

Example single contact



Curve a: 2.5 mm<sup>2</sup> Standard contact. wire gauge

Curve a: 2.5 mm<sup>2</sup> High current contact, wire gauge

| Stamped crimp contacts     |                 |                         |
|----------------------------|-----------------|-------------------------|
| Electrical Characteristics |                 |                         |
| Contact resistance         | IEC 60512-2-1   | ≤ 5 m Ω                 |
| Climatical Characteristics |                 |                         |
| Upper temperature          | IEC 60512-11-9  | + 125 °C                |
| Lower temperature          | IEC 60512-11-10 | - 40 °C                 |
| Mechanical Characteristics |                 |                         |
| Mechanical operation       | IEC 60512-9-1   | ≥ 500 mating cycles     |
| Materials                  |                 |                         |
| Pin contact                |                 | CuZn (brass)            |
| Socket contact             |                 | CuSn (tin bronze)       |
| Contact plating            |                 | Ag (silver) / Au (gold) |

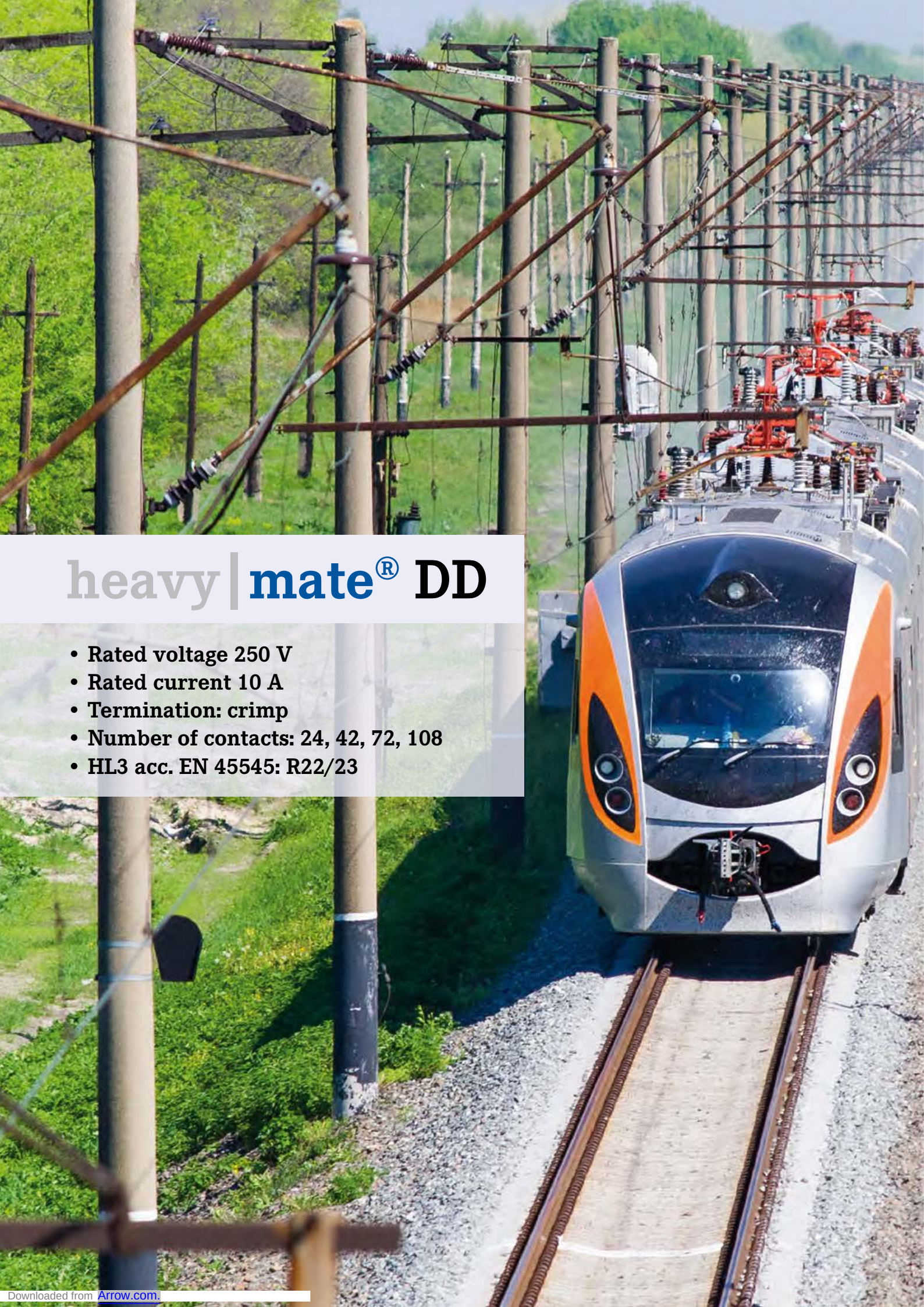
| Turned crimp contacts      |                 |                         |
|----------------------------|-----------------|-------------------------|
| Electrical Characteristics |                 |                         |
| Contact resistance         | IEC 60512-2-1   | ≤ 5 m Ω                 |
| Climatical Characteristics |                 |                         |
| Upper temperature          | IEC 60512-11-9  | + 100 °C                |
| Lower temperature          | IEC 60512-11-10 | - 40 °C                 |
| Mechanical Characteristics |                 |                         |
| Mechanical operation       | IEC 60512-9-1   | ≥ 500 mating cycles     |
| Materials                  |                 |                         |
| Pin contact                |                 | CuZn (brass)            |
| Socket contact             |                 | CuZn (brass)            |
| Contact plating            |                 | Ag (silver) / Au (gold) |



| Supplied as                                                                | for wire gauge                                          | AWG               | Pieces        | Part Number     |                       | Figure                                                                               |
|----------------------------------------------------------------------------|---------------------------------------------------------|-------------------|---------------|-----------------|-----------------------|--------------------------------------------------------------------------------------|
|                                                                            |                                                         |                   |               | Pin contact     | Socket contact        |                                                                                      |
| Stamped single contacts                                                    |                                                         |                   |               |                 |                       |                                                                                      |
| silver plating standard                                                    | 0.14 - 0.5 mm <sup>2</sup>                              | 26 - 20           | 100           | VN01 016 0003 1 | VN02 016 0003 1       |   |
|                                                                            | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 100           | VN01 016 0002 1 | VN02 016 0002 1       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 16 - 14           | 100           | VN01 016 0005 1 | VN02 016 0005 1       |                                                                                      |
| silver plating high current                                                | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 100           | VN01 016 0015 1 | VN02 016 0015 1       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 16 - 14           | 100           | VN01 016 0016 1 | VN02 016 0016 1       |                                                                                      |
| gold plating standard                                                      | 0.14 - 0.5 mm <sup>2</sup>                              | 26 - 20           | 100           | VN01 016 0003 2 | VN02 016 0003 2       |                                                                                      |
|                                                                            | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 100           | VN01 016 0002 2 | VN02 016 0002 2       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 16 - 14           | 100           | VN01 016 0005 2 | VN02 016 0005 2       |                                                                                      |
| Stamped Contacts on reel for hand crimp tools                              |                                                         |                   |               |                 |                       |                                                                                      |
| silver plating standard                                                    | 0.14 - 0.5 mm <sup>2</sup>                              | 26 - 20           | 200           | ZN01 016 0003 1 | ZN02 016 0003 1       |   |
|                                                                            | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 200           | ZN01 016 0002 1 | ZN02 016 0002 1       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 16 - 14           | 100           | ZN01 016 0005 1 | ZN02 016 0005 1       |                                                                                      |
| silver plating high current                                                | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 200           | ZN01 016 0015 1 | ZN02 016 0015 1       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 16 - 14           | 100           | ZN01 016 0016 1 | ZN02 016 0016 1       |                                                                                      |
| gold plating standard                                                      | 0.14 - 0.5 mm <sup>2</sup>                              | 26 - 20           | 200           | ZN01 016 0003 2 | ZN02 016 0003 2       |                                                                                      |
|                                                                            | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 200           | ZN01 016 0002 2 | ZN02 016 0002 2       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 16 - 14           | 100           | ZN01 016 0005 2 | ZN02 016 0005 2       |                                                                                      |
| Stamped contacts on reel for crimp machines contact feeding left hand side |                                                         |                   |               |                 |                       |                                                                                      |
| silver plating standard                                                    | 0.14 - 0.5 mm <sup>2</sup>                              | 26 - 20           | 2000          | TN01 016 0003 1 | TN02 016 0003 1       |  |
|                                                                            | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 2000          | TN01 016 0002 1 | TN02 016 0002 1       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 16 - 14           | 2000          | TN01 016 0005 1 | TN02 016 0005 1       |                                                                                      |
| silver plating high current                                                | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 2000          | TN01 016 0015 1 | TN02 016 0015 1       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 18 - 14           | 2000          | TN01 016 0016 1 | TN02 016 0016 1       |                                                                                      |
| gold plating standard                                                      | 0.14 - 0.5 mm <sup>2</sup>                              | 26 - 20           | 2000          | TN01 016 0003 2 | TN02 016 0003 2       |                                                                                      |
|                                                                            | 0.5 - 1.5 mm <sup>2</sup>                               | 20 - 16           | 2000          | TN01 016 0002 2 | TN02 016 0002 2       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | 16 - 14           | 2000          | TN01 016 0005 2 | TN02 016 0005 2       |                                                                                      |
| Tools for stamped crimp contacts                                           |                                                         |                   |               |                 |                       |                                                                                      |
| Description                                                                | for wire gauge                                          | Part Number       |               |                 | Tool                  |                                                                                      |
|                                                                            |                                                         | Contact locator   | Crimping dies |                 |                       |                                                                                      |
| Removal tool for contacts                                                  | 0,14 - 2.5 mm <sup>2</sup>                              | -                 | -             |                 | FG 0300 146 1         |                                                                                      |
| Service crimping tool                                                      | 0.14 - 0.5 mm <sup>2</sup><br>0.5 - 1.5 mm <sup>2</sup> | -                 | -             |                 | TA 0100 146           |                                                                                      |
| Crimping tool for single contacts                                          | 0.14 - 0.5 mm <sup>2</sup>                              | TA 0001 146 000 1 | TA 0000 202   |                 | TA 0000 or<br>TA 0500 |                                                                                      |
|                                                                            | 0.5 - 1.5 mm <sup>2</sup>                               | TA 0002 146 000 1 | TA 0000 163   |                 |                       |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup>                               | TA 0007 146 000 3 | TA 0000 141   |                 |                       |                                                                                      |
| Further tools see catalogue "Tools"                                        |                                                         |                   |               |                 |                       |                                                                                      |

| Supplied as                                                  | for wire gauge              | AWG               | Pieces        | Part Number           |                  | Figure                                                                              |
|--------------------------------------------------------------|-----------------------------|-------------------|---------------|-----------------------|------------------|-------------------------------------------------------------------------------------|
|                                                              |                             |                   |               | Pin contact           | Socket contact   |                                                                                     |
| Turned crimp contacts single contact                         |                             |                   |               |                       |                  |                                                                                     |
| silver plating                                               | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22           | 100           | VN01 016 0024 1C      | VN02 016 0024 1C |  |
|                                                              | 0.5 mm <sup>2</sup>         | 20                | 100           | VN01 016 0025 1C      | VN02 016 0025 1C |                                                                                     |
|                                                              | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16           | 100           | VN01 016 0026 1C      | VN02 016 0026 1C |                                                                                     |
|                                                              | 1.5 mm <sup>2</sup>         | 16 - 15           | 100           | VN01 016 0027 1C      | VN02 016 0027 1C |                                                                                     |
|                                                              | 2.5 mm <sup>2</sup>         | 14                | 100           | VN01 016 0028 1C      | VN02 016 0028 1C |                                                                                     |
| gold plating                                                 | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22           | 100           | VN01 016 0024 2C      | VN02 016 0024 2C |  |
|                                                              | 0.5 mm <sup>2</sup>         | 20                | 100           | VN01 016 0025 2C      | VN02 016 0025 2C |                                                                                     |
|                                                              | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16           | 100           | VN01 016 0026 2C      | VN02 016 0026 2C |                                                                                     |
|                                                              | 1.5 mm <sup>2</sup>         | 16 - 15           | 100           | VN01 016 0027 2C      | VN02 016 0027 2C |                                                                                     |
|                                                              | 2.5 mm <sup>2</sup>         | 14                | 100           | VN01 016 0028 2C      | VN02 016 0028 2C |                                                                                     |
| Tools                                                        |                             |                   |               |                       |                  |                                                                                     |
| Description                                                  | for wire gauge              | Part Number       |               | Tool                  |                  |                                                                                     |
|                                                              |                             | Contact locator   | Crimping dies |                       |                  |                                                                                     |
| Removal tool for contacts                                    | -                           | -                 | -             | FG 0300 146 1         |                  |                                                                                     |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2.5 mm <sup>2</sup>  | TA 0010 146 000 1 | TA 0000 184   | TA 0000 or<br>TA 0500 |                  |                                                                                     |
| 4-Indent crimping tool                                       | 0.14 - 2.5 mm <sup>2</sup>  | -                 | -             | TB 0400 146           |                  |                                                                                     |
| Further tools see catalogue “Tools”                          |                             |                   |               |                       |                  |                                                                                     |





# heavy|mate® DD

- Rated voltage 250 V
- Rated current 10 A
- Termination: crimp
- Number of contacts: 24, 42, 72, 108
- HL3 acc. EN 45545: R22/23

## heavy|mate® DD Brief information



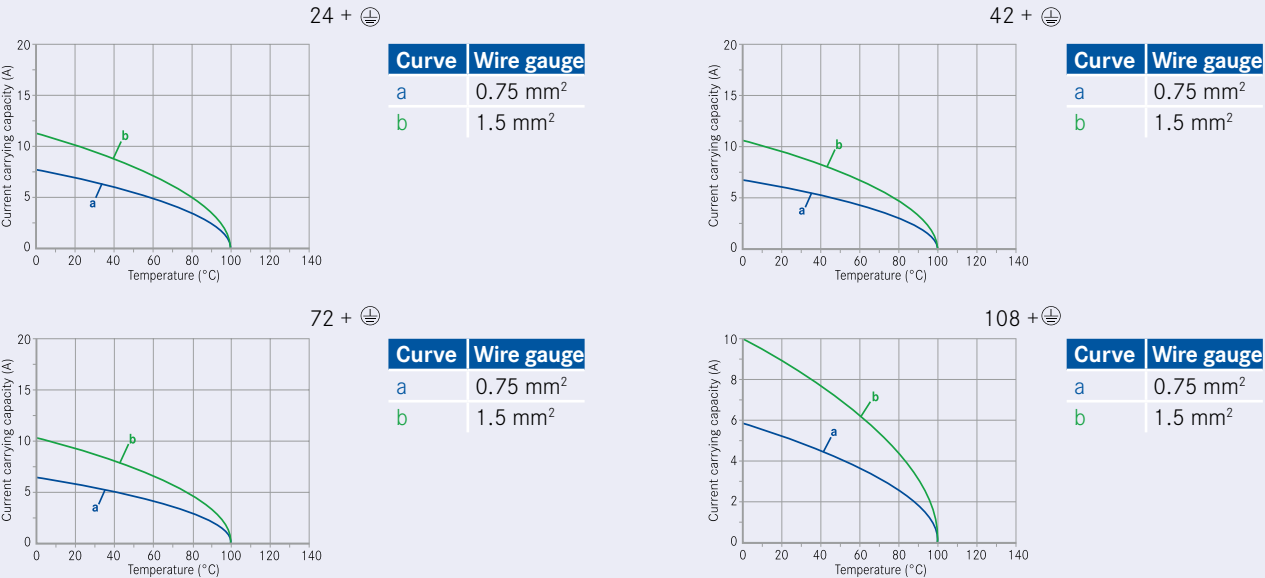
DD

| Approvals, Testhouse |                                                                                       | Characteristics | Approval-Number |
|----------------------|---------------------------------------------------------------------------------------|-----------------|-----------------|
| UL                   |  | 600 V, 8,5 A    | E 63093         |
| CSA                  |  | 600 V           | E 63093         |



| General Characteristics                             | Standard        | Value                                           |        |        |         |
|-----------------------------------------------------|-----------------|-------------------------------------------------|--------|--------|---------|
| Number of contacts                                  |                 | 24 + ⊕                                          | 42 + ⊕ | 72 + ⊕ | 108 + ⊕ |
| Termination technique                               |                 | crimp,<br>PCB (in combination with PCB-adaptor) |        |        |         |
| Wire gauge                                          |                 | 0.14 mm² - 2.5 mm²<br>(AWG 26 - 14)             |        |        |         |
| Max. wire diameter                                  |                 | 3.7 mm                                          |        |        |         |
| Flammability                                        | UL 94           | V-0                                             |        |        |         |
| Electrical Characteristics                          |                 |                                                 |        |        |         |
| Rated voltage                                       | IEC 60664-1     | 250 V (UL/CSA 600 V)                            |        |        |         |
| Rated impulse withstand voltage                     | IEC 60664-1     | 4 kV                                            |        |        |         |
| Rated Current T <sub>u</sub> = 40 °C                |                 | 10 A                                            |        |        |         |
| Current carrying capacity                           | IEC 60512-5-2   | see derating curves                             |        |        |         |
| Installation (overvoltage) category                 | IEC 60664-1     | III                                             |        |        |         |
| Material group                                      | IEC 60664-1     | III b                                           |        |        |         |
| Contact resistance                                  | IEC 60512-2-1   | ≤ 5 mΩ                                          |        |        |         |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                            |        |        |         |
| Pollution degree                                    | IEC 60664-1     | 3                                               |        |        |         |
| Climatical Characteristics                          |                 |                                                 |        |        |         |
| Climatic category                                   | IEC 60068-1     | 40 / 125 / 21                                   |        |        |         |
| Upper temperature                                   | IEC 60512-11-9  | + 125 °C                                        |        |        |         |
| Lower temperature                                   | IEC 60512-11-10 | - 40 °C                                         |        |        |         |
| Mechanical Characteristics                          |                 |                                                 |        |        |         |
| IP-degree of protection pin insert <sup>1)</sup>    | IEC 60529       | unmated IP00, mated IP20                        |        |        |         |
| IP-degree of protection socket insert <sup>1)</sup> | IEC 60529       | unmated IP20, mated IP20                        |        |        |         |
| Weight pin insert                                   |                 | 44 g                                            | 50 g   | 63 g   | 86 g    |
| Weight socket insert                                |                 | 41 g                                            | 50 g   | 67 g   | 88 g    |
| Mechanical operation                                | IEC 60512-9-1   | > 500 mating cycles                             |        |        |         |
| Materials                                           |                 |                                                 |        |        |         |
| Insert                                              |                 | PC                                              |        |        |         |
| Colour insert                                       |                 | grey                                            |        |        |         |
| Contacts                                            |                 | CuZn (brass)                                    |        |        |         |
| Contact plating                                     |                 | Ag (silver) / Au (gold)                         |        |        |         |

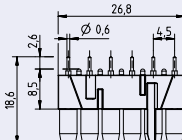
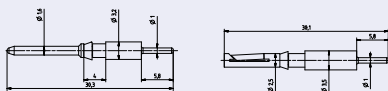
Derating curves



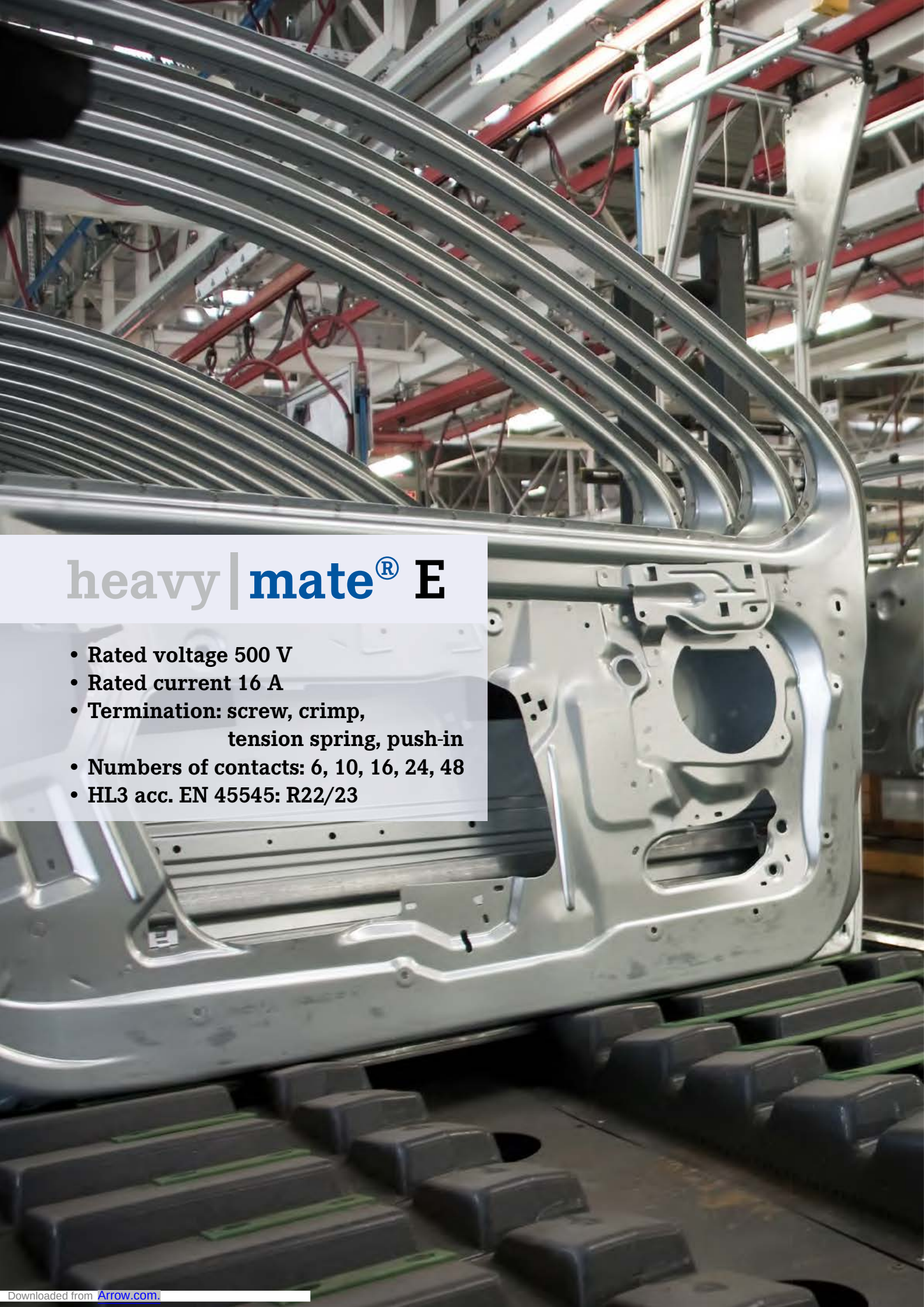
| Description                                                                                                     | Part Number       | Drawing | Figure |
|-----------------------------------------------------------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 24 + ⊕ I Size E 6 (Please order contacts separately, see page 43) Housings from page 226</b>  |                   |         |        |
| Pin insert 24 + ⊕                                                                                               | C146 10A024 000 9 |         |        |
| Socket insert 24 + ⊕                                                                                            | C146 10B024 000 9 |         |        |
| <b>Contact insert 42 + ⊕ I Size E 10 (Please order contacts separately, see page 43) Housings from page 228</b> |                   |         |        |
| Pin insert 42 + ⊕                                                                                               | C146 10A042 000 9 |         |        |
| Socket insert 42 + ⊕                                                                                            | C146 10B042 000 9 |         |        |
| <b>Contact insert 72 + ⊕ I E 16 (Please order contacts separately, see page 43) Housings from page 235</b>      |                   |         |        |
| Pin insert 72 + ⊕*                                                                                              | C146 10A072 000 9 |         |        |
| Socket insert 72 + ⊕*                                                                                           | C146 10B072 000 9 |         |        |



| Description                                                                                                      | Part Number                                 | Drawing                | Figure |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------------|------------------------|--------|
| <b>Contact insert 108 + ☉ I Size E 24 (Please order contacts separately, see page 43) Housings from page 241</b> |                                             |                        |        |
| Pin insert 108 + ☉*                                                                                              | C146 10A108 000 9                           |                        |        |
| Socket insert 108 + ☉*                                                                                           | C146 10B108 000 9                           |                        |        |
| <b>Contact insert 216 + ☉ I Size E 48 (Please order contacts separately, see page 43) Housings from page 249</b> |                                             |                        |        |
| Pin insert 216 + ☉*                                                                                              | C146 10A108 000 9<br>+<br>C146 10A108 005 9 |                        |        |
| Socket insert 216 + ☉*                                                                                           | C146 10B108 000 9<br>+<br>C146 10B108 005 9 |                        |        |
| <div> <b>Pin layout</b> </div> <div> <b>Assembly instruction</b> </div>                                          |                                             |                        |        |
| Pin insert                                                                                                       | Socket insert                               | Panel cut out (insert) |        |

| Supplied as                                                  | for wire gauge              | AWG                                  | Pieces        | Part Number                                                                          |                       | Figure                                                                               |
|--------------------------------------------------------------|-----------------------------|--------------------------------------|---------------|--------------------------------------------------------------------------------------|-----------------------|--------------------------------------------------------------------------------------|
|                                                              |                             |                                      |               | Pin contact                                                                          | Socket contact        |                                                                                      |
| Turned crimp contacts single contact 1.6mm                   |                             |                                      |               |                                                                                      |                       |                                                                                      |
| silver plating                                               | 0.14 - 0,37 mm <sup>2</sup> | 26 - 22                              | 100           | VN01 016 0024 1C                                                                     | VN02 016 0024 1C      |   |
|                                                              | 0.5 mm <sup>2</sup>         | 20                                   | 100           | VN01 016 0025 1C                                                                     | VN02 016 0025 1C      |                                                                                      |
|                                                              | 0.75 - 1,0 mm <sup>2</sup>  | 20 - 16                              | 100           | VN01 016 0026 1C                                                                     | VN02 016 0026 1C      |                                                                                      |
|                                                              | 1.5 mm <sup>2</sup>         | 16 - 15                              | 100           | VN01 016 0027 1C                                                                     | VN02 016 0027 1C      |                                                                                      |
|                                                              | 2.5 mm <sup>2</sup>         | 14                                   | 100           | VN01 016 0028 1C                                                                     | VN02 016 0028 1C      |                                                                                      |
| gold plating                                                 | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22                              | 100           | VN01 016 0024 2C                                                                     | VN02 016 0024 2C      |   |
|                                                              | 0.5 mm <sup>2</sup>         | 20                                   | 100           | VN01 016 0025 2C                                                                     | VN02 016 0025 2C      |                                                                                      |
|                                                              | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16                              | 100           | VN01 016 0026 2C                                                                     | VN02 016 0026 2C      |                                                                                      |
|                                                              | 1.5 mm <sup>2</sup>         | 16 - 15                              | 100           | VN01 016 0027 2C                                                                     | VN02 016 0027 2C      |                                                                                      |
|                                                              | 2.5 mm <sup>2</sup>         | 14                                   | 100           | VN01 016 0028 2C                                                                     | VN02 016 0028 2C      |                                                                                      |
| Description                                                  |                             | Part number                          |               | Dawing                                                                               |                       | Figure                                                                               |
| PCB adaptor 6 pole (for all inserts DD series)               |                             | C146 10B006 300 15                   |               |   |                       |   |
| PCB-contact gold plating (100 Pieces)                        |                             | VN01 016 0057 3C<br>VN02 016 0057 3C |               |  |                       |  |
| Tools for turned crimp contacts                              |                             |                                      |               |                                                                                      |                       |                                                                                      |
| Description                                                  | for wire gauge              | Part Number                          |               |                                                                                      | Tool                  |                                                                                      |
|                                                              |                             | Contact locator                      | Crimping dies |                                                                                      |                       |                                                                                      |
| Removal tool for contacts                                    | 0.14 - 2.5 mm <sup>2</sup>  | -                                    | -             |                                                                                      | FG 0300 146 1         |                                                                                      |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2.5 mm <sup>2</sup>  | TA 0010 146 0001                     | TA 0000 184   |                                                                                      | TA 0000 or<br>TA 0500 |                                                                                      |
| 4-Indent crimping tool                                       | 0.14 - 2.5 mm <sup>2</sup>  | -                                    | -             |                                                                                      | TB 0400 146           |                                                                                      |
| Further tools see catalogue “Tools”                          |                             |                                      |               |                                                                                      |                       |                                                                                      |

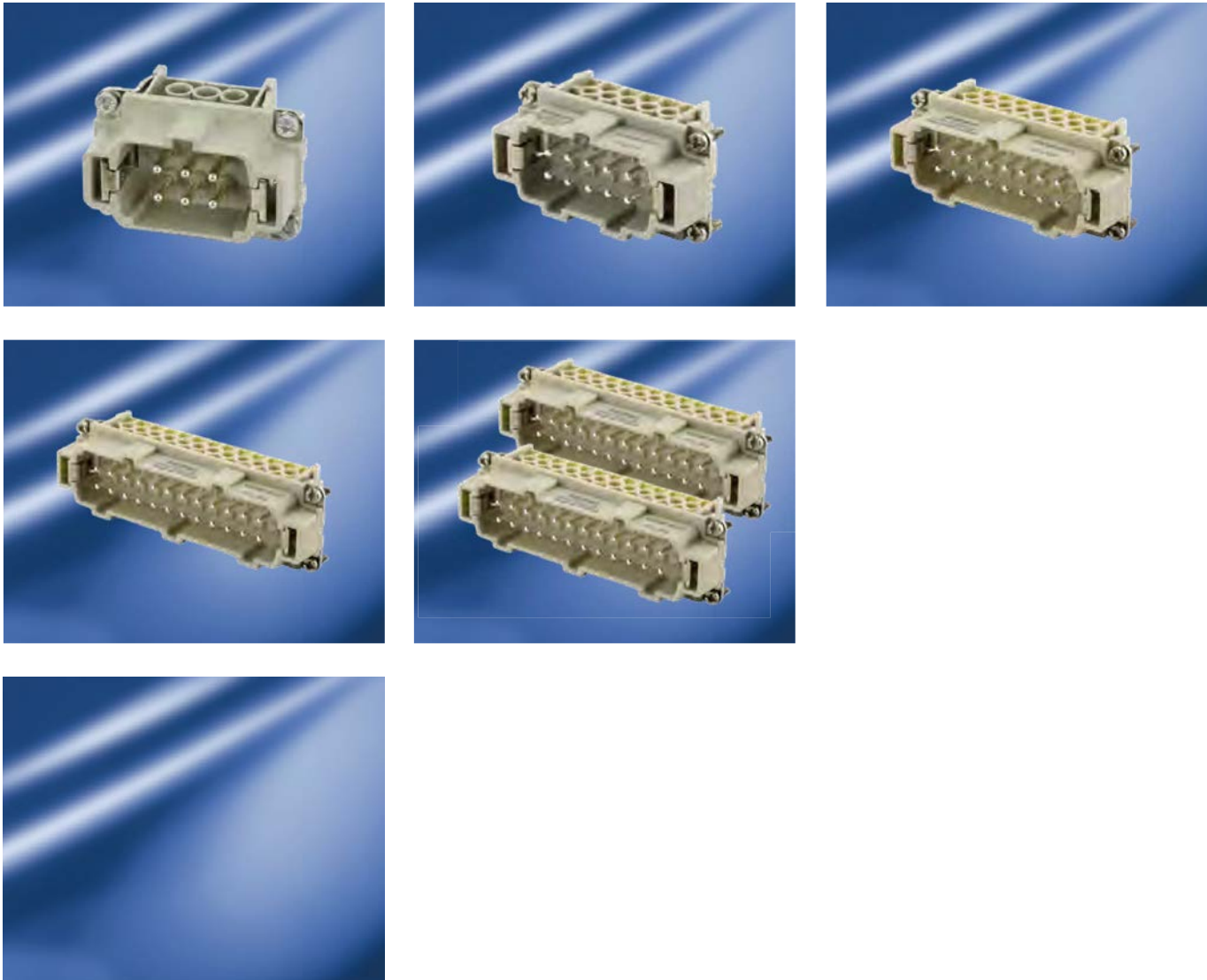




# heavy|mate® E

- Rated voltage 500 V
- Rated current 16 A
- Termination: screw, crimp, tension spring, push-in
- Numbers of contacts: 6, 10, 16, 24, 48
- HL3 acc. EN 45545: R22/23

## heavy|mate® E Brief information



| Approvals, Testhouse |                                                                                       | Characteristics | Approval-Number |
|----------------------|---------------------------------------------------------------------------------------|-----------------|-----------------|
| UL                   |  | 600 V           | E 63093         |
| CSA                  |  | 600 V           | 48932           |



General information

- Contact inserts without crimp contacts (Contact inserts with crimp termination).
  - Connectors series heavy|mate® E may be engaged or disengaged when live but without electrical load. If these connectors are mated or unmated under load, the load shall be reduced to 10 % of the rated current.
- Crimping tools and processing instructions see separate catalogue „Tools“.
  - Low and high profile housings are usable.
  - If wire ferrule are used, screw terminals without wire protection are preferred.
- 

No standard for this series, but:

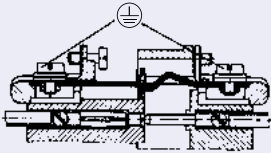
Interchangeable with other products

Housings are designed according to DIN EN 175 301 – 801

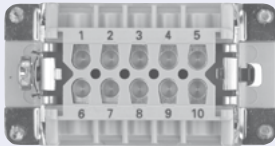
a) contact insert to contact insert 6-, 10-, 16-, 24- way

b) contact insert to housing 6-, 10-, 16-, 24- way

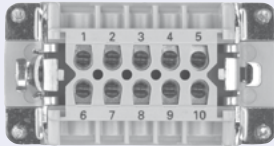
First-to-mate last-to-break protective ground contact



Contact inserts for screw termination, screw termination with wire protection and for crimp termination



Screw termination



Screw termination with wire protection



Crimp termination

Range of housings

Size E6



Size E10



Size E16



Size E24



Size E48



| General Characteristics                             | Standard        | Value                                                                  |        |        |        |        |
|-----------------------------------------------------|-----------------|------------------------------------------------------------------------|--------|--------|--------|--------|
| Number of contacts                                  |                 | 6 + ☹                                                                  | 10 + ☹ | 16 + ☹ | 24 + ☹ | 48 + ☹ |
| Termination technique                               |                 | crimp / screw / tension spring / push-in                               |        |        |        |        |
| Wire gauge                                          |                 | 0.14 - 4 mm² / push-in 0.14 - 2.5 mm²<br>(AWG 26 - 12) / (AWG 26 - 14) |        |        |        |        |
| Tightening torque                                   |                 | 0.5 Nm                                                                 |        |        |        |        |
| Max. wire diameter                                  |                 | 4.6 mm                                                                 |        |        |        |        |
| Flammability                                        | UL 94           | V-0                                                                    |        |        |        |        |
| Electrical Characteristics                          |                 |                                                                        |        |        |        |        |
| Rated voltage                                       | IEC 60664-1     | 500 V (UL/CSA 600 V)                                                   |        |        |        |        |
| Rated impulse withstand voltage                     | IEC 60664-1     | 6 kV                                                                   |        |        |        |        |
| Rated current T <sub>amp</sub> = 40 °C              |                 | 16 A                                                                   |        |        |        |        |
| Current carrying capacity                           | IEC 60512-5-2   | see derating curves                                                    |        |        |        |        |
| Installation (overvoltage) category                 | IEC 60664-1     | III                                                                    |        |        |        |        |
| Material group                                      | IEC 60664-1     | III b                                                                  |        |        |        |        |
| Contact resistance                                  | IEC 60512-2-1   | < 5 mΩ                                                                 |        |        |        |        |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                                   |        |        |        |        |
| Pollution degree                                    | IEC 60664-1     | 3                                                                      |        |        |        |        |
| Climatical Characteristics                          |                 |                                                                        |        |        |        |        |
| Climatic category                                   | IEC 60068-1     | 40 / 125 / 21                                                          |        |        |        |        |
| Upper temperature                                   | IEC 60512-11-9  | + 125 °C                                                               |        |        |        |        |
| Lower temperature                                   | IEC 60512-11-10 | - 40°C                                                                 |        |        |        |        |
| Mechanical Characteristics                          |                 |                                                                        |        |        |        |        |
| IP-degree of protection pin insert <sup>1)</sup>    | IEC 60529       | unmated IP00, mated IP20                                               |        |        |        |        |
| IP-degree of protection socket insert <sup>1)</sup> | IEC 60529       | unmatedIP20, mated IP20                                                |        |        |        |        |
| Weight:                                             |                 |                                                                        |        |        |        |        |
| Pin insert crimp<br>(for stamped contacts)          |                 | 33 g                                                                   | 39 g   | 45 g   | 55 g   | 110 g  |
| Socket insert crimp<br>(for stamped contacts)       |                 | 33 g                                                                   | 39 g   | 49 g   | 62 g   | 124 g  |
| Pin insert screw                                    |                 | 43 g                                                                   | 57 g   | 78 g   | 105 g  | 210 g  |
| Socket insert screw                                 |                 | 43 g                                                                   | 57 g   | 78 g   | 106 g  | 212 g  |
| Mechanical operation                                | IEC 60512-9-1   | > 500 mating cycles                                                    |        |        |        |        |
| Materials                                           |                 |                                                                        |        |        |        |        |
| Insert                                              |                 | PC                                                                     |        |        |        |        |
| Colour insert                                       |                 | grey                                                                   |        |        |        |        |
| Contacts                                            |                 | CuZn (brass)                                                           |        |        |        |        |
| Contact plating                                     |                 | Ag (silver) / Au (gold)                                                |        |        |        |        |



| Description                                                    | Part Number       | Drawing | Figure |
|----------------------------------------------------------------|-------------------|---------|--------|
| <b>Screw termination</b>                                       |                   |         |        |
| Pin insert<br>for screw termination                            | C146 10A006 002 1 |         |        |
| Pin insert<br>with wire protection<br>for screw termination    | C146 10A006 102 1 |         |        |
| Socket insert<br>for screw termination                         | C146 10B006 002 1 |         |        |
| Socket insert<br>with wire protection<br>for screw termination | C146 10B006 102 1 |         |        |
| <b>Tension spring</b>                                          |                   |         |        |
| Pin insert<br>with Tension spring                              | C146 10A006 400 1 |         |        |
| Pin insert<br>with Tension spring                              | C146 10B006 400 1 |         |        |
| <b>Push-in</b>                                                 |                   |         |        |
| Pin insert<br>with push-in connection                          | C146 10A006 600 1 |         |        |
| Socket insert<br>with push-in connection                       | C146 10B006 600 1 |         |        |

| Description                                                            | Part Number       | Drawing                     | Figure            |
|------------------------------------------------------------------------|-------------------|-----------------------------|-------------------|
| Stamped crimp contacts (Please order contacts separately, see page 58) |                   |                             |                   |
| Pin insert<br>for stamped crimp contacts                               | C146 10A006 000 1 |                             |                   |
| Socket insert<br>for stamped crimp contacts                            | C146 10B006 000 1 |                             |                   |
| Turned crimp contacts (Please order contacts separately, see page 58)  |                   |                             |                   |
| Pin insert<br>for turned crimp contacts                                | C146 10A006 500 1 |                             |                   |
| Socket insert<br>for turned crimp contacts                             | C146 10B006 500 1 |                             |                   |
| Pin layout                                                             |                   |                             |                   |
| Pin insert                                                             | Socket insert     | Assembly instruction        |                   |
|                                                                        |                   | Panel cut out (insert)      |                   |
|                                                                        |                   |                             |                   |
| Derating curves                                                        |                   |                             |                   |
| Stamped contacts                                                       |                   | Turned contacts             | Screw termination |
|                                                                        |                   |                             |                   |
| Curve a: 1.5 mm² wire gauge                                            |                   | Curve b: 2.5 mm² wire gauge |                   |



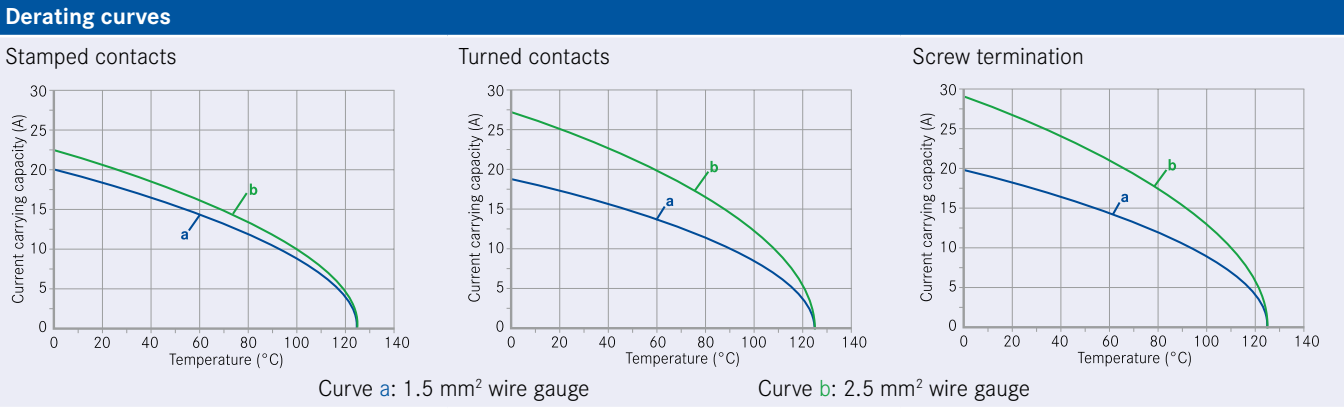
| Description                                              | Part Number       | Drawing | Figure |
|----------------------------------------------------------|-------------------|---------|--------|
| Screw termination                                        |                   |         |        |
| Pin insert for screw termination                         | C146 10A010 002 1 |         |        |
| Pin insert with wire protection for screw termination    | C146 10A010 102 1 |         |        |
| Socket insert for screw termination                      | C146 10B010 002 1 |         |        |
| Socket insert with wire protection for screw termination | C146 10B010 102 1 |         |        |
| Tension spring                                           |                   |         |        |
| Pin insert with Tension spring                           | C146 10A010 400 1 |         |        |
| Socket insert with Tension spring                        | C146 10B010 400 1 |         |        |
| Push-in                                                  |                   |         |        |
| Pin insert with push-in connection                       | C146 10A010 600 1 |         |        |
| Socket insert with push-in connection                    | C146 10B010 600 1 |         |        |

| Description                                                            | Part Number       | Drawing                     | Figure            |
|------------------------------------------------------------------------|-------------------|-----------------------------|-------------------|
| Stamped crimp contacts (Please order contacts separately, see page 58) |                   |                             |                   |
| Pin insert for stamped crimp contacts                                  | C146 10A010 000 1 |                             |                   |
| Socket insert for stamped crimp contacts                               | C146 10B010 000 1 |                             |                   |
| Turned crimp contacts (Please order contacts separately, see page 58)  |                   |                             |                   |
| Pin insert for turned crimp contacts                                   | C146 10A010 500 1 |                             |                   |
| Socket insert for turned crimp contacts                                | C146 10B010 500 1 |                             |                   |
| Pin layout                                                             |                   | Assembly instruction        |                   |
| Pin insert                                                             | Socket insert     | Panel cut out (insert)      |                   |
| Derating curves                                                        |                   |                             |                   |
| Stamped contacts                                                       |                   | Turned contacts             | Screw termination |
|                                                                        |                   |                             |                   |
| Curve a: 1.5 mm² wire gauge                                            |                   | Curve b: 2.5 mm² wire gauge |                   |



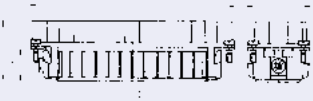
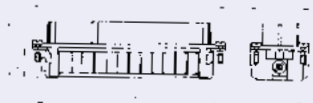
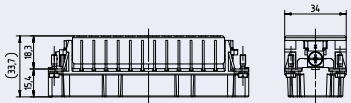
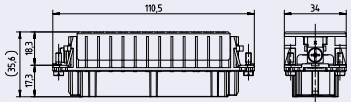
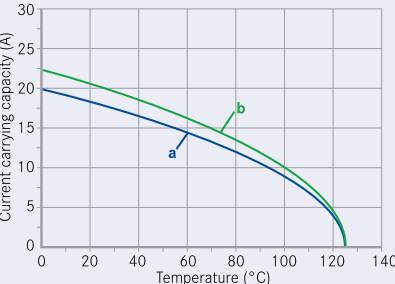
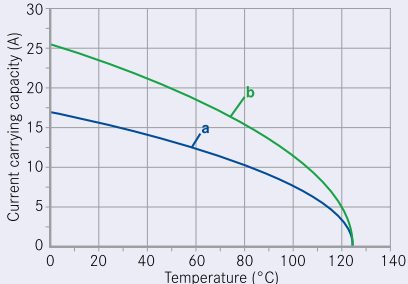
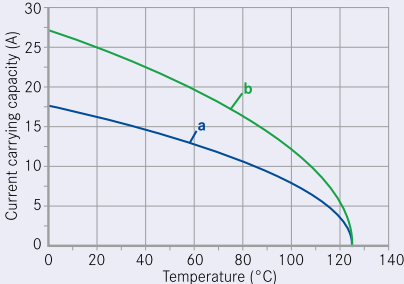
| Description                                                    | Part Number       | Drawing | Figure |
|----------------------------------------------------------------|-------------------|---------|--------|
| <b>Screw termination</b>                                       |                   |         |        |
| Pin insert<br>for screw termination                            | C146 10A016 002 1 |         |        |
| Pin insert<br>with wire protection<br>for screw termination    | C146 10A016 102 1 |         |        |
| Socket insert<br>for screw termination                         | C146 10B016 002 1 |         |        |
| Socket insert<br>with wire protection<br>for screw termination | C146 10B016 102 1 |         |        |
| <b>Tension spring</b>                                          |                   |         |        |
| Pin insert<br>with Tension spring                              | C146 10A016 400 1 |         |        |
| Socket insert<br>with Tension spring                           | C146 10B016 400 1 |         |        |
| <b>Push-in</b>                                                 |                   |         |        |
| Pin insert<br>with push-in connection                          | C146 10A016 600 1 |         |        |
| Socket insert<br>with push-in connection                       | C146 10B016 600 1 |         |        |

| Description                                                                   | Part Number       | Drawing                | Figure |
|-------------------------------------------------------------------------------|-------------------|------------------------|--------|
| <b>Stamped crimp contacts (Please order contacts separately, see page 58)</b> |                   |                        |        |
| Pin insert<br>for stamped crimp contacts                                      | C146 10A016 000 1 |                        |        |
| Socket insert<br>for stamped crimp contacts                                   | C146 10B016 000 1 |                        |        |
| <b>Turned crimp contacts (Please order contacts separately, see page 58)</b>  |                   |                        |        |
| Pin insert<br>for turned crimp contacts                                       | C146 10A016 500 1 |                        |        |
| Socket insert<br>for turned crimp contacts                                    | C146 10B016 500 1 |                        |        |
| <b>Pin layout</b>                                                             |                   |                        |        |
| Pin insert                                                                    | Socket insert     | Panel cut out (insert) |        |
|                                                                               |                   |                        |        |





| Description                                              | Part Number       | Drawing | Figure |
|----------------------------------------------------------|-------------------|---------|--------|
| Screw termination                                        |                   |         |        |
| Pin insert for screw termination                         | C146 10A024 002 1 |         |        |
| Pin insert with wire protection for screw termination    | C146 10A024 102 1 |         |        |
| Socket insert for screw termination                      | C146 10B024 002 1 |         |        |
| Socket insert with wire protection for screw termination | C146 10B024 102 1 |         |        |
| Tension spring                                           |                   |         |        |
| Pin insert with Tension spring                           | C146 10A024 400 1 |         |        |
| Socket insert with Tension spring                        | C146 10B024 400 1 |         |        |
| Push-in                                                  |                   |         |        |
| Pin insert with push-in connection                       | C146 10A024 600 1 |         |        |
| Socket insert with push-in connection                    | C146 10B024 600 1 |         |        |

| Description                                                                           | Part Number                                                                           | Drawing                                                                               | Figure                                                                                |
|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Stamped crimp contacts (Please order contacts separately, see page 58)                |                                                                                       |                                                                                       |                                                                                       |
| Pin insert<br>for stamped crimp contacts                                              | C146 10A024 000 1                                                                     |    |    |
| Socket insert<br>for stamped crimp contacts                                           | C146 10B024 000 1                                                                     |    |    |
| Turned crimp contacts (Please order contacts separately, see page 58)                 |                                                                                       |                                                                                       |                                                                                       |
| Pin insert<br>for turned crimp contacts                                               | C146 10A024 500 1                                                                     |    |   |
| Socket insert<br>for turned crimp contacts                                            | C146 10B024 500 1                                                                     |  |  |
| Pin layout                                                                            |                                                                                       |                                                                                       |                                                                                       |
| Pin insert                                                                            | Socket insert                                                                         | Assembly instruction                                                                  |                                                                                       |
|  |  |  |                                                                                       |
| Derating curves                                                                       |                                                                                       |                                                                                       |                                                                                       |
| Stamped contacts                                                                      |                                                                                       | Turned contacts                                                                       | Screw termination                                                                     |
|  |                                                                                       |  |  |
| Curve a: 1.5 mm <sup>2</sup> wire gauge                                               |                                                                                       | Curve b: 2.5 mm <sup>2</sup> wire gauge                                               |                                                                                       |



| Description                                                            | Part Number                                 | Drawing | Figure |
|------------------------------------------------------------------------|---------------------------------------------|---------|--------|
| Screw termination                                                      |                                             |         |        |
| Pin insert<br>for screw termination                                    | C146 10A024 002 1<br>+<br>C146 10A024 002 1 |         |        |
| Pin insert<br>with wire protection<br>for screw termination            | C146 10A024 102 1<br>+<br>C146 10A024 102 1 |         |        |
| Socket insert<br>for screw termination                                 | C146 10B024 002 1<br>+<br>C146 10B024 002 1 |         |        |
| Socket insert<br>with wire protection<br>for screw termination         | C146 10B024 102 1<br>+<br>C146 10B024 102 1 |         |        |
| Stamped crimp contacts (Please order contacts separately, see page 58) |                                             |         |        |
| Pin insert<br>for stamped crimp contacts                               | C146 10A024 000 1<br>+<br>C146 10A024 000 1 |         |        |
| Socket insert<br>for stamped crimp contacts                            | C146 10B024 000 1<br>+<br>C146 10B024 000 1 |         |        |
| Turned crimp contacts (Please order contacts separately, see page 58)  |                                             |         |        |
| Pin insert<br>for turned crimp contacts                                | C146 10A024 500 1<br>+<br>C146 10A024 500 1 |         |        |
| Socket insert<br>for turned crimp contacts                             | C146 10B024 500 1<br>+<br>C146 10B024 500 1 |         |        |

Pin layout

Pin insert

Socket insert

Assembly instruction

Panel cut out (insert)

Derating curves

Stamped contacts

Turned contacts

Screw termination

| Temperature (°C) | Curve a (1.5 mm²) (A) | Curve b (2.5 mm²) (A) |
|------------------|-----------------------|-----------------------|
| 0                | 15                    | 20                    |
| 25               | 14                    | 19                    |
| 50               | 13                    | 18                    |
| 75               | 11                    | 16                    |
| 100              | 8                     | 12                    |
| 125              | 4                     | 6                     |

Curve a: 1.5 mm² wire gauge

Curve b: 2.5 mm² wire gauge

Large range of wire gauges

VN01 025 0001 1C

VN01 025 0010 1C



Gas-tight (coldwelding)

0.5

1.0

1.5

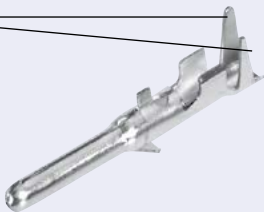
1.5

2.5



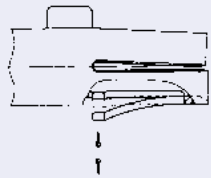
Stamped crimp contacts with insulation crimp, to absorb mechanical stress from the crimped connection

Insulation grip

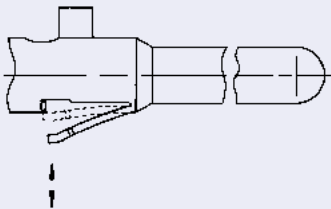


Mechanical retention spring stop on socket and pin contact

Socket contact

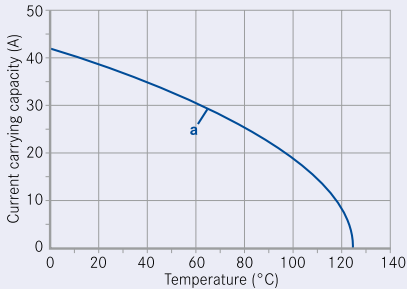


Pin contact



High current carrying capacity

Example single contact



Curve a: 2.5 mm<sup>2</sup> wire gauge

Stamped crimp contacts

| Electrical Characteristics |               |                         |
|----------------------------|---------------|-------------------------|
| Contact resistance         | IEC 60512-2-1 | < 5 m Ω                 |
| Mechanical Characteristics |               |                         |
| Mechanical operation       | IEC 60512-9-1 | ≥ 500 mating cycles     |
| Materials                  |               |                         |
| Pin contact                |               | CuZn (brass)            |
| Socket contact             |               | CuSn (tin bronze)       |
| Contact plating            |               | Ag (silver) / Au (gold) |

Turned crimp contacts

| Electrical Characteristics |                 |                         |
|----------------------------|-----------------|-------------------------|
| Contact resistance         | IEC 60512-2-1   | ≤ 5 m Ω                 |
| Climatical Characteristics |                 |                         |
| Upper temperature          | IEC 60512-11-9  | + 125 °C                |
| Lower temperature          | IEC 60512-11-10 | - 40 °C                 |
| Mechanical Characteristics |                 |                         |
| Mechanical operation       | IEC 60512-9-1   | ≥ 500 mating cycles     |
| Materials                  |                 |                         |
| Pin contact                |                 | CuZn (brass)            |
| Socket contact             |                 | CuZn (brass)            |
| Contact plating            |                 | Ag (silver) / Au (gold) |



| Supplied as                                                                | for wire gauge            | AWG              | Pieces        | Part Number           |                   | Figure                                                                               |
|----------------------------------------------------------------------------|---------------------------|------------------|---------------|-----------------------|-------------------|--------------------------------------------------------------------------------------|
|                                                                            |                           |                  |               | Pin contact           | Socket contact    |                                                                                      |
| Stamped single contacts                                                    |                           |                  |               |                       |                   |                                                                                      |
| silver plating                                                             | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16          | 100           | VN01 025 0001 101     | VN02 025 0001 101 |   |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup> | 16- 14           | 100           | VN01 025 0010 101     | VN02 025 0010 101 |                                                                                      |
|                                                                            | 2.5 - 4 mm <sup>2</sup>   | 14 - 12          | 100           | VN01 025 0043 1       | VN02 025 0043 1   |                                                                                      |
| gold plating                                                               | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16          | 100           | VN01 025 0001 102     | VN02 025 0001 102 |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup> | 16- 14           | 100           | VN01 025 0010 102     | VN02 025 0010 102 |                                                                                      |
|                                                                            | 2.5 - 4 mm <sup>2</sup>   | 14 - 12          | 100           | VN01 025 0043 2       | VN02 025 0043 2   |                                                                                      |
| Stamped Contacts on reel for hand crimp tools                              |                           |                  |               |                       |                   |                                                                                      |
| silver plating                                                             | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16          | 200           | ZN01 025 0001 1       | ZN02 025 0001 1   |   |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup> | 16 - 14          | 100           | ZN01 025 0010 1       | ZN02 025 0010 1   |                                                                                      |
| gold plating                                                               | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16          | 200           | ZN01 025 0001 2       | ZN02 025 0001 2   |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup> | 16 - 14          | 100           | ZN01 025 0010 2       | ZN02 025 0010 2   |                                                                                      |
| Stamped contacts on reel for crimp machines contact feeding left hand side |                           |                  |               |                       |                   |                                                                                      |
| silver plating                                                             | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16          | 2000          | TN01 025 0001 1       | TN02 025 0001 1   |  |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup> | 16 - 14          | 2000          | TN01 025 0010 1       | TN02 025 0010 1   |                                                                                      |
|                                                                            | 2.5 - 4 mm <sup>2</sup>   | 14 - 12          | 2000          | TN01 025 0043 1       | TN02 025 0043 1   |                                                                                      |
| Tools for turned crimp contacts                                            |                           |                  |               |                       |                   |                                                                                      |
| Description                                                                | for wire gauge            | Part Number      |               |                       |                   |                                                                                      |
|                                                                            |                           | Contact locator  | Crimping dies | Tool                  |                   |                                                                                      |
| Removal tool for contacts                                                  | 0.5 - 4.0 mm <sup>2</sup> | -                | -             | FG 0200 146 1         |                   |                                                                                      |
| Crimping tool for stamped single contacts                                  | 0.5 - 1.5 mm <sup>2</sup> | TA 0004 146 0001 | TA 0000 163   | TA 0000 or<br>TA 0500 |                   |                                                                                      |
|                                                                            | 1.5 - 2.5 mm <sup>2</sup> | TA 0005 146 0003 | TA 0000 141   |                       |                   |                                                                                      |
|                                                                            | 2.5 - 4.0 mm <sup>2</sup> | TA 0003 146 0001 | TA 0000 121   |                       |                   |                                                                                      |
| Further tools see catalogue “Tools”                                        |                           |                  |               |                       |                   |                                                                                      |

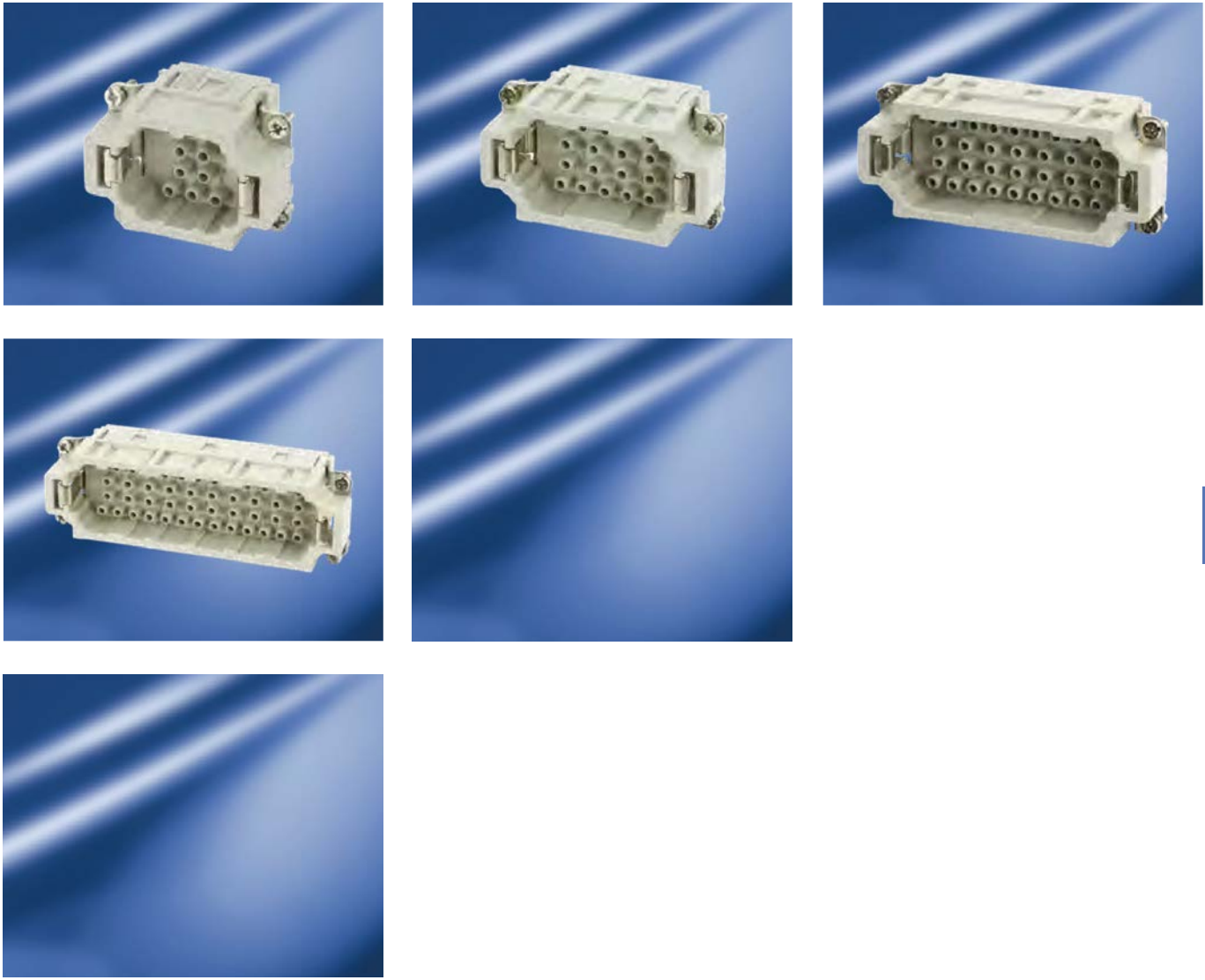
| Supplied as                                | for wire gauge              | AWG               | Pieces        | Part Number      |                       | Figure                                                                              |
|--------------------------------------------|-----------------------------|-------------------|---------------|------------------|-----------------------|-------------------------------------------------------------------------------------|
|                                            |                             |                   |               | Pin contact      | Socket contact        |                                                                                     |
| Turned crimp contacts single contact       |                             |                   |               |                  |                       |                                                                                     |
| silver plating                             | 0.14 - 0.37 mm <sup>2</sup> | 22 - 26           | 100           | VN01 025 0055 1C | VN02 025 0055 1C      |  |
|                                            | 0.5 mm <sup>2</sup>         | 20                | 100           | VN01 025 0035 1C | VN02 025 0035 1C      |                                                                                     |
|                                            | 0.75 - 1.0 mm <sup>2</sup>  | 18                | 100           | VN01 025 0036 1C | VN02 025 0036 1C      |                                                                                     |
|                                            | 1.5 mm <sup>2</sup>         | 16                | 100           | VN01 025 0037 1C | VN02 025 0037 1C      |                                                                                     |
|                                            | 2.5 mm <sup>2</sup>         | 14                | 100           | VN01 025 0038 1C | VN02 025 0038 1C      |                                                                                     |
|                                            | 4.0 mm <sup>2</sup>         | 12                | 100           | VN01 025 0039 1C | VN02 025 0039 1C      |                                                                                     |
| gold plating                               | 0.14 - 0.37 mm <sup>2</sup> | 22 - 26           | 100           | VN01 025 0055 2C | VN02 025 0055 2C      |  |
|                                            | 0.5 mm <sup>2</sup>         | 20                | 100           | VN01 025 0035 2C | VN02 025 0035 2C      |                                                                                     |
|                                            | 0.75 - 1.0 mm <sup>2</sup>  | 18                | 100           | VN01 025 0036 2C | VN02 025 0036 2C      |                                                                                     |
|                                            | 1.5 mm <sup>2</sup>         | 16                | 100           | VN01 025 0037 2C | VN02 025 0037 2C      |                                                                                     |
|                                            | 2.5 mm <sup>2</sup>         | 14                | 100           | VN01 025 0038 2C | VN02 025 0038 2C      |                                                                                     |
|                                            | 3.0 mm <sup>2</sup>         | -                 | 100           | VN01 025 0059 2C | VN02 025 0059 2C      |                                                                                     |
|                                            | 4.0 mm <sup>2</sup>         | 12                | 100           | VN01 025 0039 2C | VN02 025 0039 2C      |                                                                                     |
| Tools for turned crimp contacts            |                             |                   |               |                  |                       |                                                                                     |
| Description                                | for wire gauge              | Part Number       |               |                  | Tool                  |                                                                                     |
|                                            |                             | Contact locator   | Crimping dies |                  |                       |                                                                                     |
| Removal tool for contacts                  | 0.14 - 4.0 mm <sup>2</sup>  | -                 | -             |                  | FG 0300 146 7         |                                                                                     |
| Standard crimping tool and accessories for | 0.14 - 0.37 mm <sup>2</sup> | TA 0010 146 000 6 | TA 0000 144   |                  | TA 0000 or<br>TA 0500 |                                                                                     |
|                                            | 0.5 - 2.5 mm <sup>2</sup>   | TA 0010 146 000 7 | TA 0000 124   |                  |                       |                                                                                     |
| 4-Indent crimping                          | 3.0 - 4.0 mm <sup>2</sup>   | TA 0010 146 000 7 | TA 0000 124   |                  |                       |                                                                                     |
| 4-Indent crimping tool                     | 0.14 - 4.0 mm <sup>2</sup>  | -                 | -             |                  | TB 0600 146           |                                                                                     |
| Further tools see catalogue “Tools”        |                             |                   |               |                  |                       |                                                                                     |



# heavy | mate® EE

- Rated voltage 500 V
- Rated current 16 A
- Termination: crimp
- Numbers of contacts: 10, 18, 32, 46
- HL3 acc. EN 45545: R22/23

## heavy | mate® EE Brief information



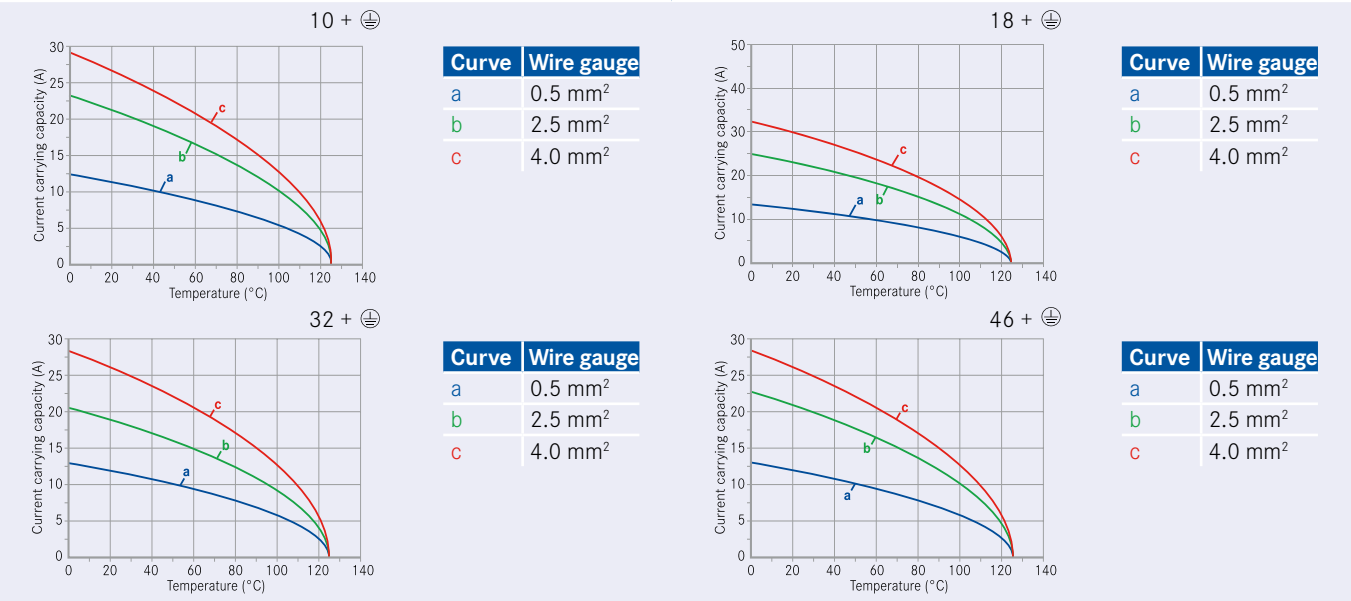
EE

| Approvals, Testhouse |                                                                                       | Characteristics | Approval-Number |
|----------------------|---------------------------------------------------------------------------------------|-----------------|-----------------|
| UL                   |  | 600 V           | E 63093         |
| CSA                  |  | 600 V           | E 63093         |



| General Characteristics               | Standard        | Value                              |        |        |        |
|---------------------------------------|-----------------|------------------------------------|--------|--------|--------|
| Number of contacts                    |                 | 10 + ⊕                             | 18 + ⊕ | 32 + ⊕ | 46 + ⊕ |
| Termination technique                 |                 | crimp                              |        |        |        |
| Wire gauge                            |                 | 0.14 mm² - 4.0 mm²<br>(AWG 26 -12) |        |        |        |
| Max. wire diameter                    |                 | 4.8 mm                             |        |        |        |
| Flammability                          | UL 94           | V-0                                |        |        |        |
| Electrical Characteristics            |                 |                                    |        |        |        |
| Rated voltage                         | IEC 60664-1     | 500 V (UL / CSA 600 V)             |        |        |        |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                               |        |        |        |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 16 A                               |        |        |        |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                |        |        |        |
| Installation (overvoltage) category   | IEC 60664-1     | III                                |        |        |        |
| Material group                        | IEC 60664-1     | III b                              |        |        |        |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 m Ω                            |        |        |        |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω               |        |        |        |
| Pollution degree                      | IEC 60664-1     | 3                                  |        |        |        |
| Climatical Characteristics            |                 |                                    |        |        |        |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                      |        |        |        |
| Upper temperature                     | IEC 60512-11-9  | + 125 °C                           |        |        |        |
| Lower temperature                     | IEC 60512-11-10 | - 40 °C                            |        |        |        |
| Mechanical Characteristics            |                 |                                    |        |        |        |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP00, mated IP20           |        |        |        |
| IP-degree of protection socket insert | IEC 60529       | unmated IP20, mated IP20           |        |        |        |
| Weight pin insert                     |                 | 55g                                | 60g    | 63g    | 80g    |
| Weight socket insert                  |                 | 55g                                | 70g    | 85g    | 80g    |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                |        |        |        |
| Materials                             |                 |                                    |        |        |        |
| Insert                                |                 | PC                                 |        |        |        |
| Colour insert                         |                 | grey                               |        |        |        |
| Contacts                              |                 | CuZn (brass)                       |        |        |        |
| Contact plating                       |                 | Ag (silver) / Au (gold)            |        |        |        |

Derating-Kurven



| Description                                                                                                    | Part Number        | Drawing | Figure |
|----------------------------------------------------------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 10 + ⊕ I Size E 6 (Please order contacts separately, see page 67) Housings from page 226</b> |                    |         |        |
| Pin insert 10 + ⊕                                                                                              | C146 10A010 500 10 |         |        |
| Socket insert 10 + ⊕                                                                                           | C146 10B010 500 10 |         |        |

| Pin layout                        | Assembly instruction       |  |
|-----------------------------------|----------------------------|--|
| <br>Pin insert      Socket insert | <br>Panel cut out (insert) |  |

| Description                                                                                                     | Part Number        | Drawing | Figure |
|-----------------------------------------------------------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 18 + ⊕ I Size E 10 (Please order contacts separately, see page 67) Housings from page 228</b> |                    |         |        |
| Pin insert 18 + ⊕                                                                                               | C146 10A018 500 10 |         |        |
| Socket insert 18 + ⊕                                                                                            | C146 10B018 500 10 |         |        |

| Pin layout                        | Assembly instruction       |  |
|-----------------------------------|----------------------------|--|
| <br>Pin insert      Socket insert | <br>Panel cut out (insert) |  |

| Description                                                                                                     | Part Number        | Drawing | Figure |
|-----------------------------------------------------------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 32 + ⊕ I Size E 16 (Please order contacts separately, see page 67) Housings from page 235</b> |                    |         |        |
| Pin insert 32 + ⊕                                                                                               | C146 10A032 500 10 |         |        |
| Socket insert 32 + ⊕                                                                                            | C146 10B032 500 10 |         |        |

**Pin layout**

Pin insert

Socket insert

**Assembly instruction**

| Description                                                                                                     | Part Number        | Drawing | Figure |
|-----------------------------------------------------------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 46 + ⊕ I Size E 24 (Please order contacts separately, see page 67) Housings from page 235</b> |                    |         |        |
| Pin insert 46 + ⊕                                                                                               | C146 10A046 500 10 |         |        |
| Socket insert 46 + ⊕                                                                                            | C146 10B046 500 10 |         |        |

**Pin layout**

Pin insert

Socket insert

**Assembly instruction**

| Supplied as                                | for wire gauge                              | AWG   | Pieces | Part Number      |                  | Figure                                                                              |
|--------------------------------------------|---------------------------------------------|-------|--------|------------------|------------------|-------------------------------------------------------------------------------------|
|                                            |                                             |       |        | Pin contact      | Socket contact   |                                                                                     |
| Turned crimp contacts single contact 2.5mm |                                             |       |        |                  |                  |                                                                                     |
| silver plating                             | 0.14 mm <sup>2</sup> - 0.37 mm <sup>2</sup> | 26-22 | 100    | VN01 025 0055 1C | VN02 025 0055 1C |  |
|                                            | 0.5 mm <sup>2</sup>                         | 20    | 100    | VN01 025 0035 1C | VN02 025 0035 1C |                                                                                     |
|                                            | 0.75 - 1.0 mm <sup>2</sup>                  | 18    | 100    | VN01 025 0036 1C | VN02 025 0036 1C |                                                                                     |
|                                            | 1.5 mm <sup>2</sup>                         | 16    | 100    | VN01 025 0037 1C | VN02 025 0037 1C |                                                                                     |
|                                            | 2.5 mm <sup>2</sup>                         | 14    | 100    | VN01 025 0038 1C | VN02 025 0038 1C |                                                                                     |
|                                            | 3.0 mm <sup>2</sup>                         | -     | 100    | VN01 025 0059 1C | VN02 025 0059 1C |                                                                                     |
|                                            | 4.0 mm <sup>2</sup>                         | 12    | 100    | VN01 025 0039 1C | VN02 025 0039 1C |                                                                                     |
| gold plating                               | 0.14 mm <sup>2</sup> - 0.37 mm <sup>2</sup> | 26-22 | 100    | VN01 025 0055 2C | VN02 025 0055 2C |  |
|                                            | 0.5 mm <sup>2</sup>                         | 20    | 100    | VN01 025 0035 2C | VN02 025 0035 2C |                                                                                     |
|                                            | 0.75 - 1.0 mm <sup>2</sup>                  | 18    | 100    | VN01 025 0036 2C | VN02 025 0036 2C |                                                                                     |
|                                            | 1.5 mm <sup>2</sup>                         | 16    | 100    | VN01 025 0037 2C | VN02 025 0037 2C |                                                                                     |
|                                            | 2.5 mm <sup>2</sup>                         | 14    | 100    | VN01 025 0038 2C | VN02 025 0038 2C |                                                                                     |
|                                            | 3.0 mm <sup>2</sup>                         | -     | 100    | VN01 025 0059 2C | VN02 025 0059 2C |                                                                                     |
|                                            | 4.0 mm <sup>2</sup>                         | 12    | 100    | VN01 025 0039 2C | VN02 025 0039 2C |                                                                                     |

| Tools for turned crimp contacts                              |                             |                   |               |                    |
|--------------------------------------------------------------|-----------------------------|-------------------|---------------|--------------------|
| Description                                                  | for wire gauge              | Contact locator   | Part Number   |                    |
|                                                              |                             |                   | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.14 - 4.0 mm <sup>2</sup>  | -                 | -             | FG 0300 146 7      |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 0.37 mm <sup>2</sup> | TA 0010 146 000 6 | TA 0000 144   | TA 0000 or TA 0500 |
|                                                              | 0.5 - 2.5 mm <sup>2</sup>   | TA 0010 146 000 7 | TA 0000 124   |                    |
|                                                              | 3.0 - 4.0 mm <sup>2</sup>   | TA 0010 146 000 7 | TA 0000 124   |                    |
| 4-Indent crimping tool                                       | 0.14 - 4.0 mm <sup>2</sup>  |                   |               | TB 0600 146        |
| Further tools see catalogue "Tools"                          |                             |                   |               |                    |





# heavy | mate<sup>®</sup> EEE

- Rated voltage 500 V
- Rated current 16 A
- Termination: crimp
- Numbers of contacts: 40, 64
- HL3 acc. EN 45545: R22/23

## heavy | mate<sup>®</sup> EEE Brief information



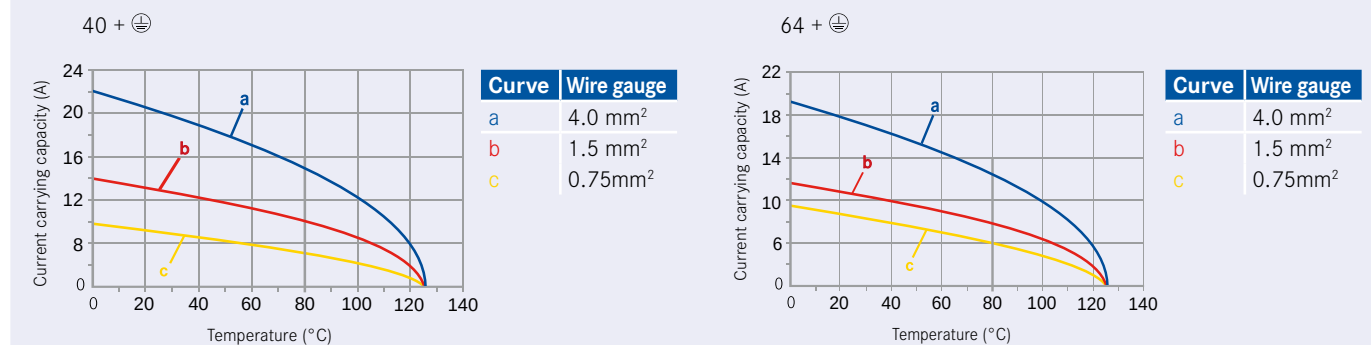
EEE

| Approvals, Testhouse |                                                                                       | Characteristics | Approval-Number |
|----------------------|---------------------------------------------------------------------------------------|-----------------|-----------------|
| UL                   |  | in preparation  | in preparation  |
| CSA                  |  | in preparation  | in preparation  |



| General Characteristics               | Standard        | Value                               |        |
|---------------------------------------|-----------------|-------------------------------------|--------|
| Number of contacts                    |                 | 40 + ☹                              | 64 + ☹ |
| Termination technique                 |                 | crimp                               |        |
| Wire gauge                            |                 | 0.14 mm² - 4.0 mm²<br>(AWG 26 - 12) |        |
| Max. wire diameter                    |                 | 4.6 mm                              |        |
| Flammability                          | UL 94           | V-0                                 |        |
| Electrical Characteristics            |                 |                                     |        |
| Rated voltage                         | IEC 60664-1     | 500 V                               |        |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                                |        |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 16 A                                |        |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                 |        |
| Installation (overvoltage) category   | IEC 60664-1     | III                                 |        |
| Material group                        | IEC 60664-1     | III b                               |        |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 m Ω                             |        |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                |        |
| Pollution degree                      | IEC 60664-1     | 3                                   |        |
| Climatical Characteristics            |                 |                                     |        |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                       |        |
| Upper temperature                     | IEC 60512-11-9  | + 125 °C                            |        |
| Lower temperature                     | IEC 60512-11-10 | - 40 °C                             |        |
| Mechanical Characteristics            |                 |                                     |        |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP00, mated IP20            |        |
| IP-degree of protection socket insert | IEC 60529       | unmated IP20, mated IP20            |        |
| Weight pin insert                     |                 | 56 g                                | 69 g   |
| Weight socket insert                  |                 | 69 g                                | 87 g   |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                 |        |
| Materials                             |                 |                                     |        |
| Insert                                |                 | PC                                  |        |
| Colour insert                         |                 | grey                                |        |
| Contacts                              |                 | CuZn (brass)                        |        |
| Contact plating                       |                 | Ag (silver) / Au (gold)             |        |

## Derating curves

[illegible]



| Supplied as                                                  | for wire gauge                                                                      | AWG                                                         | Pieces                                    | Part Number           |                  | Figure                                                                              |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------|-----------------------|------------------|-------------------------------------------------------------------------------------|
|                                                              |                                                                                     |                                                             |                                           | Pin contact           | Socket contact   |                                                                                     |
| Turned crimp contacts single contact                         |                                                                                     |                                                             |                                           |                       |                  |                                                                                     |
| silver plating                                               | 0.14 mm <sup>2</sup> - 0.37 mm <sup>2</sup>                                         | 26-22                                                       | 100                                       | VN01 025 0055 1C      | VN02 025 0055 1C |  |
|                                                              | 0.5 mm <sup>2</sup>                                                                 | 20                                                          | 100                                       | VN01 025 0035 1C      | VN02 025 0035 1C |                                                                                     |
|                                                              | 0.75 - 1.0 mm <sup>2</sup>                                                          | 18                                                          | 100                                       | VN01 025 0036 1C      | VN02 025 0036 1C |                                                                                     |
|                                                              | 1.5 mm <sup>2</sup>                                                                 | 16                                                          | 100                                       | VN01 025 0037 1C      | VN02 025 0037 1C |                                                                                     |
|                                                              | 2.5 mm <sup>2</sup>                                                                 | 14                                                          | 100                                       | VN01 025 0038 1C      | VN02 025 0038 1C |                                                                                     |
|                                                              | 3.0 mm <sup>2</sup>                                                                 | -                                                           | 100                                       | VN01 025 0059 1C      | VN02 025 0059 1C |                                                                                     |
|                                                              | 4.0 mm <sup>2</sup>                                                                 | 12                                                          | 100                                       | VN01 025 0039 1C      | VN02 025 0039 1C |                                                                                     |
| gold plating                                                 | 0.14 mm <sup>2</sup> - 0.37 mm <sup>2</sup>                                         | 26-22                                                       | 100                                       | VN01 025 0055 2C      | VN02 025 0055 2C |  |
|                                                              | 0.5 mm <sup>2</sup>                                                                 | 20                                                          | 100                                       | VN01 025 0035 2C      | VN02 025 0035 2C |                                                                                     |
|                                                              | 0.75 - 1.0 mm <sup>2</sup>                                                          | 18                                                          | 100                                       | VN01 025 0036 2C      | VN02 025 0036 2C |                                                                                     |
|                                                              | 1.5 mm <sup>2</sup>                                                                 | 16                                                          | 100                                       | VN01 025 0037 2C      | VN02 025 0037 2C |                                                                                     |
|                                                              | 2.5 mm <sup>2</sup>                                                                 | 14                                                          | 100                                       | VN01 025 0038 2C      | VN02 025 0038 2C |                                                                                     |
|                                                              | 3.0 mm <sup>2</sup>                                                                 | -                                                           | 100                                       | VN01 025 0059 2C      | VN02 025 0059 2C |                                                                                     |
|                                                              | 4.0 mm <sup>2</sup>                                                                 | 12                                                          | 100                                       | VN01 025 0039 2C      | VN02 025 0039 2C |                                                                                     |
| Tools for turned crimp contacts                              |                                                                                     |                                                             |                                           |                       |                  |                                                                                     |
| Description                                                  | for wire gauge                                                                      | Part Number                                                 |                                           |                       |                  |                                                                                     |
|                                                              |                                                                                     | Contact locator                                             | Crimping dies                             | Tool                  |                  |                                                                                     |
| Removal tool for contacts                                    | 0.14 - 4.0 mm <sup>2</sup>                                                          | -                                                           | -                                         | FG 0300 146 7         |                  |                                                                                     |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 0.37 mm <sup>2</sup><br>0.5 - 2.5 mm <sup>2</sup><br>3.0 - 4 mm <sup>2</sup> | TA 0010 146 000 6<br>TA 0010 146 000 7<br>TA 0010 146 000 7 | TA 0000 144<br>TA 0000 124<br>TA 0000 124 | TA 0000 or<br>TA 0500 |                  |                                                                                     |
| 4-Indent crimping tool                                       | 0.14 - 0.37 mm <sup>2</sup>                                                         | -                                                           | -                                         | TB 0600 146           |                  |                                                                                     |
| Further tools see catalogue “Tools”                          |                                                                                     |                                                             |                                           |                       |                  |                                                                                     |



# heavy|mate<sup>®</sup> E / FE / KO

- Rated voltage 500 V
- Material contacts: iron-constantan
- Rated current 10 A
- Number of contacts: 6, 10, 16, 24
- HL3 acc. EN 45545: R22/23

## heavy|mate<sup>®</sup> E / FE / KO Brief information



E / FE /  
KO



Connectors with iron (FE) and constantan (CO) contacts

are basically used in measuring and control circuits to serve as interface between FE/CO thermocouples and control unit, i. e. temperature control of moulds in injection moulding machines. Through the use of FE/CO connectors in the thermocouple circuit the measuring results are more accurate, thus the tolerance of the temperature control is much narrower.

Amphenol's Industial Connectors with iron (FE) an Contantan (CO) contacts are used to connect FE/CO thermocouples with electronic signal amplifiers in measuring and control circuits, i. e. for temperature control of moulding machines.

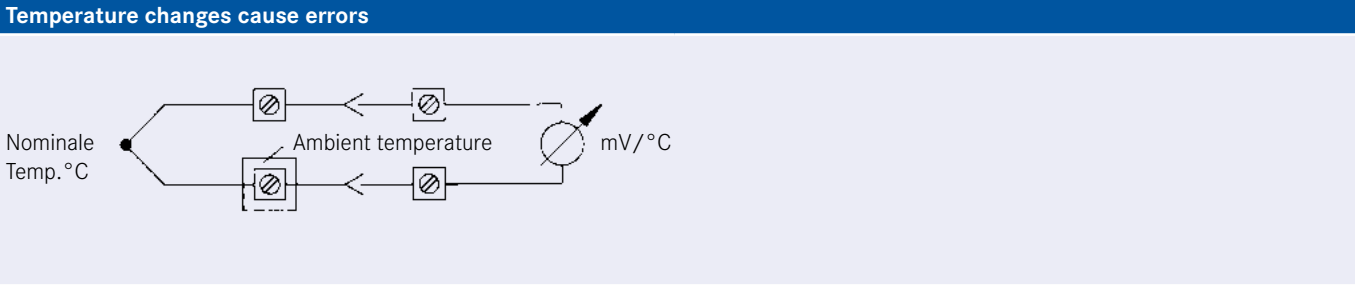
Errors with various combinations

The connection of unlike metals (FE/Brass and CO/Brass) generate thermoelectric voltage errors in the mesuring circuit caused by the flow from iron wire to the brass contact or by temperature changes at the contact elements.

| Nominal Temp. | Contact Material | without Thermo Contacts |          | with Thermo Contacts |         |
|---------------|------------------|-------------------------|----------|----------------------|---------|
|               |                  | MS/FE                   | MS/KO    | FE/FE                | KO/KO   |
| 100 °C        |                  | + 4 %                   | - 16 %   | - 4 %                | - 2 %   |
| 200 °C        |                  | + 2.5 %                 | - 8 %    | - 3 %                | - 1.5 % |
| 300 °C        |                  | + 1.3 %                 | - 12.7 % | - 1.3 %              | 0 %     |
| 400 °C        |                  | + 1.5 %                 | - 4.5 %  | - 1.0 %              | 0 %     |

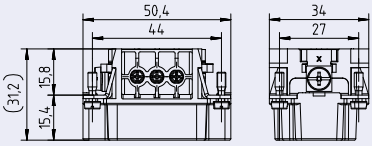
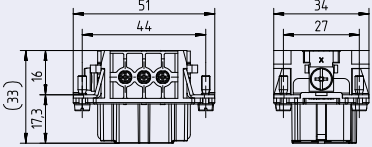
By using FE/CO contacts respectively these deviations will be minimized.

| Material / Temperature Range |                                 |
|------------------------------|---------------------------------|
| Temperatur range             | Material/measurement procedure  |
| < 150 °C                     | any/Resistance measurement      |
| 150 °C - 450 °C              | FE-CO (iron/Constantan)         |
| 450 °C - approx. 1000 °C     | Ni/Cr-Ni (Nickel/Chrome/Nickel) |



| General Characteristics                             | Standard        | Value                                          |        |        |        |
|-----------------------------------------------------|-----------------|------------------------------------------------|--------|--------|--------|
| Number of contacts                                  |                 | 6 + ☹                                          | 10 + ☹ | 16 + ☹ | 24 + ☹ |
| Termination technique                               |                 | screw                                          |        |        |        |
| Wire gauge                                          |                 | 0.5 mm² - 2.5 mm²<br>(AWG 20 - 14)             |        |        |        |
| Max. wire diameter                                  |                 | 4.6 mm                                         |        |        |        |
| Flammability                                        | UL 94           | V-0                                            |        |        |        |
| Electrical Characteristics                          |                 |                                                |        |        |        |
| Rated voltage                                       | IEC 60664-1     | 500 V                                          |        |        |        |
| Rated impulse withstand voltage                     | IEC 60664-1     | 6 kV                                           |        |        |        |
| Rated current T <sub>amp</sub> = 40 °C              |                 | 10 A                                           |        |        |        |
| Installation (overvoltage) category                 | IEC 60664-1     | III                                            |        |        |        |
| Material group                                      | IEC 60664-1     | III b                                          |        |        |        |
| Contact resistance                                  | IEC 60512-2-1   | ≤ 10 m Ω                                       |        |        |        |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                           |        |        |        |
| Pollution degree                                    | IEC 60664-1     | 3                                              |        |        |        |
| Climatical Characteristics                          |                 |                                                |        |        |        |
| Climatic category                                   | IEC 60068-1     | 40 / 100 / 21                                  |        |        |        |
| Upper temperature                                   | IEC 60512-11-9  | + 100 °C                                       |        |        |        |
| Lower temperature                                   | IEC 60512-11-10 | - 40 °C                                        |        |        |        |
| Mechanical Characteristics                          |                 |                                                |        |        |        |
| IP-degree of protection pin insert <sup>1)</sup>    | IEC 60529       | unmated IP00, mated IP20                       |        |        |        |
| IP-degree of protection socket insert <sup>1)</sup> | IEC 60529       | unmated IP20, mated IP20                       |        |        |        |
| Weight pin insert                                   |                 | 45 g                                           | 60 g   | 78 g   | 105 g  |
| Weight socket insert                                |                 | 45 g                                           | 60 g   | 78 g   | 105 g  |
| Mechanical operation                                | IEC 60512-9-1   | ≥ 100 mating cycles                            |        |        |        |
| Materials                                           |                 |                                                |        |        |        |
| Insert                                              |                 | PC                                             |        |        |        |
| Colour insert                                       |                 | grey                                           |        |        |        |
| Contacts                                            |                 | iron; gal cd 4<br>constantan = without plating |        |        |        |
| Contact plating                                     |                 |                                                |        |        |        |

E / FE /  
KO

| Description                                                                                                                                                                 | Part Number       | Drawing                                                                            | Figure                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Contact insert 6 +  with iron-constantan contacts I Size E6, Housings from page 226</b> |                   |                                                                                    |                                                                                     |
| Pin insert<br>with wire protection                                                                                                                                          | C146 10A006 810 1 |  |  |
| Socket insert<br>with wire protection                                                                                                                                       | C146 10B006 810 1 |  |  |

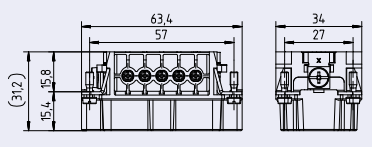
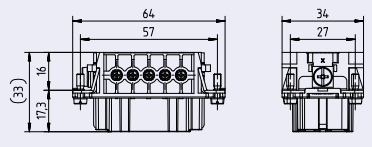
Pin layout

Assembly instruction

Pin insert

Socket insert

Panel cut out (insert)

| Description                                                                                                                                                                     | Part Number       | Drawing                                                                              | Figure                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Contact insert 10 +  with iron-constantan contacts I Size E10, Housings from page 228</b> |                   |                                                                                      |                                                                                       |
| Pin insert<br>with wire protection                                                                                                                                              | C146 10A010 810 1 |  |  |
| Socket insert<br>with wire protection                                                                                                                                           | C146 10B010 810 1 |  |  |

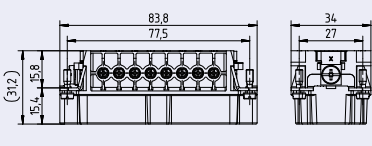
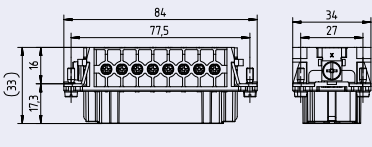
Pin layout

Assembly instruction

Pin insert

Socket insert

Panel cut out (insert)

| Description                                                                                                                                                            | Part Number       | Drawing                                                                             | Figure                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Contact insert 16 +  with iron-constantan contacts I Size E16, from page 235</b> |                   |                                                                                     |                                                                                     |
| Pin insert<br>with wire protection                                                                                                                                     | C146 10A016 810 1 |  |  |
| Socket insert<br>with wire protection                                                                                                                                  | C146 10B016 810 1 |  |  |

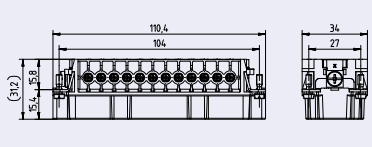
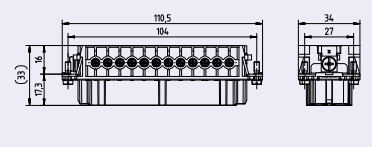
Pin layout

Assembly instruction

Pin insert

Socket insert

Panel cut out (insert)

| Description                                                                                                                                                                       | Part Number       | Drawing                                                                               | Figure                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Contact insert 24 +  with iron-constantan contacts I Size E24, Housings from page 241</b> |                   |                                                                                       |                                                                                       |
| Pin insert<br>with wire protection                                                                                                                                                | C146 10A024 810 1 |  |  |
| Socket insert<br>with wire protection                                                                                                                                             | C146 10B024 810 1 |  |  |

Pin layout

Assembly instruction

Pin insert

Socket insert

Panel cut out (insert)

E / FE /  
KO





# heavy | mate® F

- Modular connector
- Compatible with market standard
- Rated voltage up to 1000 V
- Rated current up to 220 A
- Numbers of contacts: 1 - 108
- HL3 acc. EN 45545: R22/23

## heavy | mate® F Brief information



| Approvals, Testhouse                                                                         | Characteristics               | Approval-Number |
|----------------------------------------------------------------------------------------------|-------------------------------|-----------------|
| UL<br>  | see technical characteristics | E 63093         |
| CSA<br> | see technical characteristics | E 63093         |



General information

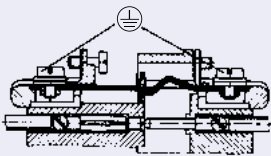
- Modules inserts without crimp contacts, crimping tools see separate catalogue “Tools”.
  - Contacts must be ordered separately, processing instructions see catalogue “Tools”.
  - Connectors series heavy|mate® F may be engaged or disengaged when live but without electrical load.  
If these connectors are mated or unmated under load, the load shall be reduced to 10 % of rated current.
- We recommend using the high profile housings / hoods for the heavy|mate® F inserts.
  - Empty modul spaces have to be filled with blind modules.
  - Torque for PE connection 1.2 Nm



Advantages of the system

- No standard but interchangeable with competitive products.
- Housings are designed according to DIN EN 175 301 801
- Simply connecting of the modules and frames.

First-to-mate last-to-break protective ground contact



Range of housings

| Size E6  | Size E10 | Size E16 |
|----------|----------|----------|
|          |          |          |
| Size E24 | Size E48 |          |
|          |          |          |

Requirements

- 3 x 400V; 50A; 6mm² wire gauge
- 8 x 250V; 8A; 1.5mm² wire gauge
- 5 x 400V; 15A; 4mm² wire gauge

Solution

1. Check how 16 contacts can be realized; see modules overview on page 84

- Possible selection:
- a) 1 x 17 contacts
  - b) 2 x 12 contacts
  - c) 1 x 6 contacts + 1 x 12 contacts
  - d) 1 x 3 contacts + 1 x 6 contacts + 1 x 12 contacts

2. Check technical parameters / solution, see detail pages of the modules from page 96

- Possible selection:
- a) not possible due to voltage
  - b) not possible due to voltage
  - c) not possible due to current
  - d) POSSIBLE

3. Choose matching contact, see detail page of the modules on page 96

- Possible selection:
- a) 3 contacts = C146 10A003 600 15 → contacts = VN01 040 0013 1C
  - b) 6 contacts = C146 10A006 600 15 → contacts = VN01 025 0039 1C
  - c) 12 contacts = C146 10A012 600 15 → contacts = VN01 016 0027 1C

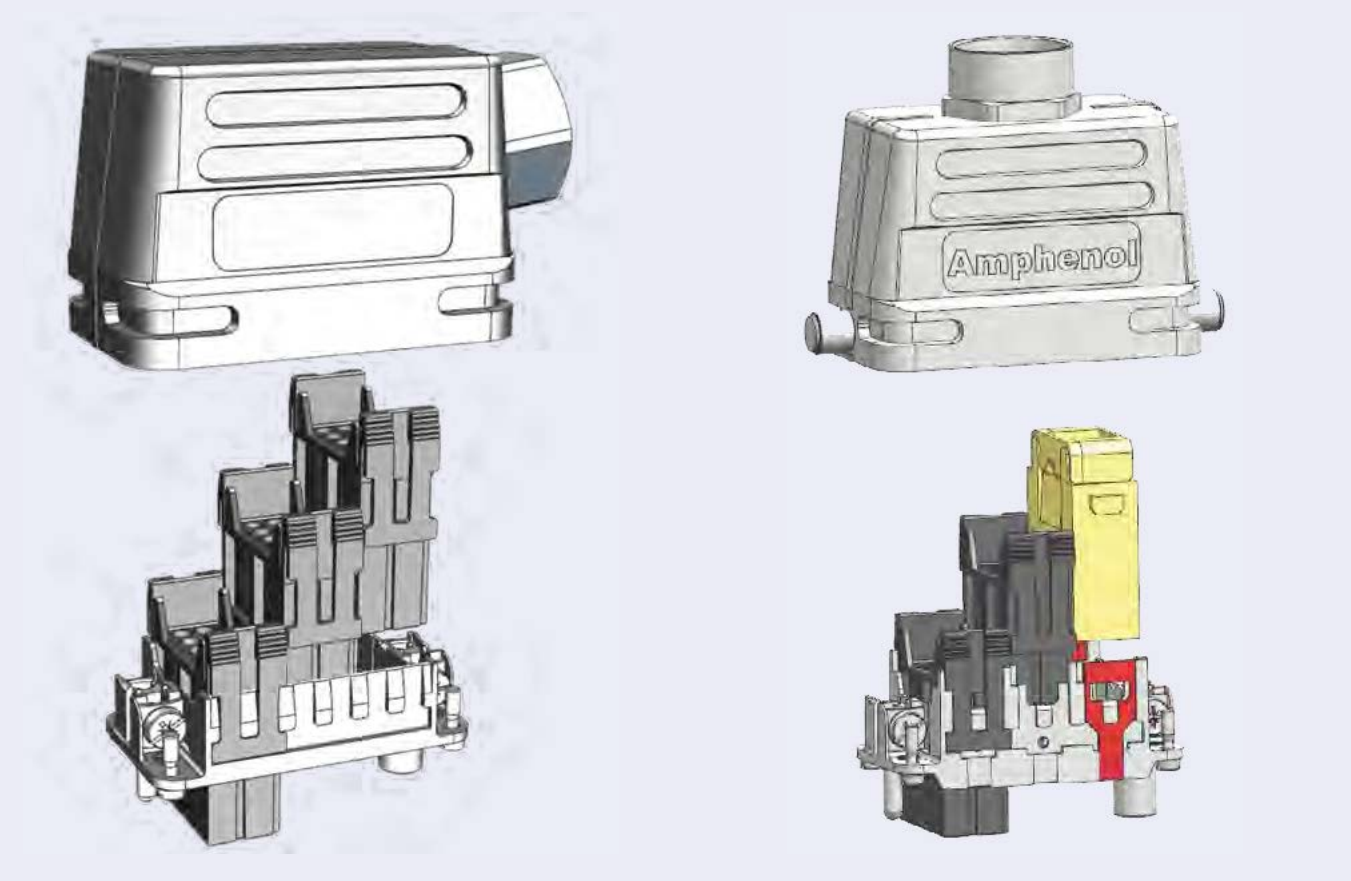
4. Choose matching frame, see frames on page 92

Solution: C146 10P10 000 15

5. Choose matching housing, see housings on page 228

Solution: C146 21R010 600 8

Schematic construction





| Description                                    | Part Number                              | Drawing | Figure |
|------------------------------------------------|------------------------------------------|---------|--------|
| 1 contacts module, 1000V, details see page 96* |                                          |         |        |
| Pin module 1 contact                           | C146 10A001 600 15                       |         |        |
| Socket module 1 contact                        | C146 10B001 600 15                       |         |        |
| 2 contacts module, 1000V, details see page 98  |                                          |         |        |
| Pin module 2 contacts                          | C146 10A002 600 15                       |         |        |
| Socket module 2 contacts                       | C146 10B002 600 15                       |         |        |
| 3 contacts module, details see page 100        |                                          |         |        |
| Pin module 3 contacts                          | C146 10A003 600 15<br>C146 10A003 601 15 |         |        |
| Socket module 3 contacts                       | C146 10B003 600 15<br>C146 10B003 601 15 |         |        |

| Description                                       | Part Number        | Drawing | Figure |
|---------------------------------------------------|--------------------|---------|--------|
| 3+4 contacts module, 830 V, details see page 102* |                    |         |        |
| Pin module 3+4 contacts                           | C146 10A007 600 15 |         |        |
| Socket module 3+4 contacts                        | C146 10B007 600 15 |         |        |
| 4 contacts module, 830 V, details see page XXX    |                    |         |        |
| Pin module 4 contacts                             | C146 10A004 600 15 |         |        |
| Socket module 4 contacts                          | C146 10B004 600 15 |         |        |

| Description                                     | Part Number        | Drawing | Figure |
|-------------------------------------------------|--------------------|---------|--------|
| 6 contacts module, 500 V, details see page 106  |                    |         |        |
| Pin module 6 contacts                           | C146 10A006 600 15 |         |        |
| Socket module 6 contacts                        | C146 10B006 600 15 |         |        |
| 8 contacts module, 400 V, details see page 108  |                    |         |        |
| Pin module 8 contacts                           | C146 10A008 600 15 |         |        |
| Socket modules 8 contacts                       | C146 10B008 600 15 |         |        |
| 12 contacts module, 250 V, details see page 110 |                    |         |        |
| Pin module 12 contacts                          | C146 10A012 600 15 |         |        |
| Socket module 12 contacts                       | C146 10B012 600 15 |         |        |

| Description                                     | Part Number        | Drawing | Figure |
|-------------------------------------------------|--------------------|---------|--------|
| 17 contacts module, 160 V, details see page 112 |                    |         |        |
| Pin module 17 contacts                          | C146 10A017 600 15 |         |        |
| Socket module 17 contacts                       | C146 10B017 600 15 |         |        |
| 20 contacts module, 500 V, details see page 114 |                    |         |        |
| Pin module 20 contacts                          | C146 10A020 600 15 |         |        |
| Socket module 20 contacts                       | C146 10B020 600 15 |         |        |
| 36 contacts module, 250 V, details see page 120 |                    |         |        |
| Pin module 36 contacts                          | C146 10A036 600 15 |         |        |
| Socket module 36 contacts                       | C146 10B036 600 15 |         |        |



| Description                                                                                               | Part Number                              | Drawing | Figure |
|-----------------------------------------------------------------------------------------------------------|------------------------------------------|---------|--------|
| Adaptor modules, details see page 122                                                                     |                                          |         |        |
| Adaptor modules for Gigabit- and Megabit pin contact carrier                                              | C146 10A001 800 15                       |         |        |
| Adaptor modules for Gigabit- and Megabit socket contact carrier 8 pole                                    | C146 10B001 800 15                       |         |        |
| Gigabit contact carrier 8 pole, CAT7, details see page 123*                                               |                                          |         |        |
| Pin contact carrier<br>- without shieldconnection to the frame<br>- with shieldconnection to the frame    | C146 10A008 901 15<br>C146 10A008 902 15 |         |        |
| Socket contact carrier<br>- without shieldconnection to the frame<br>- with shieldconnection to the frame | C146 10B008 901 15<br>C146 10B008 902 15 |         |        |
| Megabit contact carrier 8 pole, CAT5e, details see page 124 *                                             |                                          |         |        |
| Pin contact carrier<br>- without shieldconnection to the frame<br>- with shieldconnection to the frame    | C146 10A008 905 15<br>C146 10A008 906 15 |         |        |
| Socket contact carrier<br>- without shieldconnection to the frame<br>- with shieldconnection to the frame | C146 10B008 905 15<br>C146 10B008 906 15 |         |        |

| Description                         | Part Number        | Drawing | Figure |
|-------------------------------------|--------------------|---------|--------|
| D-Sub module, details see page 128* |                    |         |        |
| Pin module D-Sub 9 contacts         | C146 10A009 600 15 |         |        |
| Socket module D-Sub 9 contacts      | C146 10B009 600 15 |         |        |

| Description                                                  | Part Number        | Drawing | Figure |
|--------------------------------------------------------------|--------------------|---------|--------|
| Adaptor modules, details see page 116                        |                    |         |        |
| Adaptor modules for Quintax- and Coax pin contact carrier    | C146 10A002 800 15 |         |        |
| Adaptor modules for Quintax- and Coax socket contact carrier | C146 10B002 800 15 |         |        |
| Quintax contact carrier, CAT5e, 50 V, details see page 116   |                    |         |        |
| Pin contact carrier 4 pole                                   | C146 10A004 901 15 |         |        |
| Socket contact carrier 4 pole                                | C146 10B004 901 15 |         |        |
| Coax contact carrier, 50 Ω, details see page 118             |                    |         |        |
| Pin contact carrier 1 pole                                   | C146 10A001 902 15 |         |        |
| Socket contact carrier 1 pole                                | C146 10B001 902 15 |         |        |

| Description                                     | Part Number        | Drawing | Figure |
|-------------------------------------------------|--------------------|---------|--------|
| Coax contact carrier 75 Ω, details see page 118 |                    |         |        |
| Pin contact carrier 1 pole                      | C146 10A001 901 15 |         |        |
| Socket contact carrier 1 pole                   | C146 10B001 901 15 |         |        |
| Blind modules, details see page 130*            |                    |         |        |
| Blind module with centering function**          | C146 10H000 600 15 |         |        |
| Blind module standard                           | C146 10H000 601 15 |         |        |

F



| Description                                             | Part Number        | Drawing | Figure |
|---------------------------------------------------------|--------------------|---------|--------|
| Frame for 2 modules   Size E6   Housings from page 226  |                    |         |        |
| Frame for 2 pin modules                                 | C146 10P006 000 15 |         |        |
| Frame for 2 socket modules                              | C146 10S006 000 15 |         |        |
| Frame for 3 modules   Size E10   Housings from page 228 |                    |         |        |
| Frame for 3 pin modules                                 | C146 10P010 000 15 |         |        |
| Frame for 3 socket modules                              | C146 10S010 000 15 |         |        |
| Frame for 4 modules   Size E16   Housings from page 235 |                    |         |        |
| Frame for 4 pin modules                                 | C146 10P016 000 15 |         |        |
| Frame for 4 socket modules                              | C146 10S016 000 15 |         |        |

| Description                                             | Part Number        | Drawing | Figure |
|---------------------------------------------------------|--------------------|---------|--------|
| Frame for 6 modules   Size E24   Housings from page 241 |                    |         |        |
| Frame for 6 pin modules                                 | C146 10P024 000 15 |         |        |
| Frame for 6 socket modules                              | C146 10S024 000 15 |         |        |

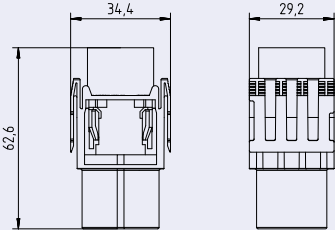
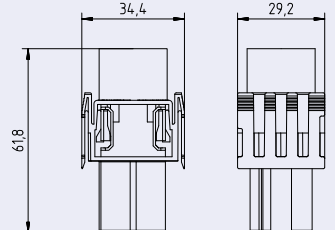
| Delivery form                                                                                                                          | for wire gauge | AWG   | Pieces | Part Number      |                | Figure                                                                               |
|----------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|--------|------------------|----------------|--------------------------------------------------------------------------------------|
|                                                                                                                                        |                |       |        | Pin contact      | Socket contact |                                                                                      |
| Cable lug for earth connection                                                                                                         |                |       |        |                  |                |                                                                                      |
| Cable lug                                                                                                                              | 10 - 16 mm²    | 8 - 6 | 1      | N15 043 0003 003 |                |  |
| Clamp 1 under screw is approved for wires up to 6 mm2 (with wire end sleeve). For wires 10 - 16 mm² please use clamp 2 with cable lug. |                |       |        |                  |                |                                                                                      |

| Description                                                  | Part Number        | Drawing | Figure |
|--------------------------------------------------------------|--------------------|---------|--------|
| Multiframe for 2 modules   Size E6   Housings from page 226  |                    |         |        |
| Frame for 2 pin modules                                      | C146 10P006 100 15 |         |        |
| Frame for 2 socket modules                                   | C146 10S006 100 15 |         |        |
| Multiframe for 3 modules   Size E10   Housings from page 228 |                    |         |        |
| Frame for 3 pin modules                                      | C146 10P010 100 15 |         |        |
| Frame for 3 socket modules                                   | C146 10S010 100 15 |         |        |
| Multiframe for 4 modules   Size E16   Housings from page 235 |                    |         |        |
| Frame for 4 pin modules                                      | C146 10P016 100 15 |         |        |
| Frame for 4 socket modules                                   | C146 10S016 100 15 |         |        |

| Description                                                                                                                            |                    | Part number | Drawing | Figure            |        |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------|---------|-------------------|--------|
| Multiframe for 6 modules   Size E24   Housings from page 241                                                                           |                    |             |         |                   |        |
| Multiframe for 6 pin modules                                                                                                           | C146 10P024 100 15 |             |         |                   |        |
| Multiframe for 6 socket modules                                                                                                        | C146 10S024 100 15 |             |         |                   |        |
| Locking device   used for modules from competitors                                                                                     |                    |             |         |                   |        |
| Locking device<br>10 Pieces                                                                                                            | VN 09 146 0019 X   |             |         |                   |        |
| Supplied as                                                                                                                            | for wire gauge     | AWG         | Pieces  | Part Number       | Figure |
| Cable lug for earth connection                                                                                                         |                    |             |         |                   |        |
| Cable lug                                                                                                                              | 10 - 16 mm²        | 8 - 6       | 1       | N 15 043 0003 003 |        |
| Clamp 1 under screw is approved for wires up to 6 mm2 (with wire end sleeve). For wires 10 - 16 mm2 please use clamp 2 with cable lug. |                    |             |         |                   |        |



| General Characteristics                                                                                                                                                                                                                                              | Standard      | Value                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Number of contacts                                                                                                                                                                                                                                                   |               | 1                                                                                                                                                                             |
| Termination technique                                                                                                                                                                                                                                                |               | crimp                                                                                                                                                                         |
| Wire gauge                                                                                                                                                                                                                                                           |               | 25 - 95 mm <sup>2</sup><br>(AWG 4 - 000)                                                                                                                                      |
| Max. wire diameter                                                                                                                                                                                                                                                   |               | 20 mm                                                                                                                                                                         |
| Flammability                                                                                                                                                                                                                                                         | UL94          | V-0                                                                                                                                                                           |
| Electrical Characteristics                                                                                                                                                                                                                                           |               |                                                                                                                                                                               |
| Rated voltage                                                                                                                                                                                                                                                        | IEC 60664-1   | 1000 V                                                                                                                                                                        |
| Rated impulse withstand voltage                                                                                                                                                                                                                                      | IEC 60664-1   | 8 kV                                                                                                                                                                          |
| Rated Current T <sub>u</sub> = 40 °C                                                                                                                                                                                                                                 |               | 200 A                                                                                                                                                                         |
| Current carrying capacity                                                                                                                                                                                                                                            | IEC 60512-5-2 | see derating curves                                                                                                                                                           |
| Installation (overvoltage) category                                                                                                                                                                                                                                  | IEC 60664-1   | III                                                                                                                                                                           |
| Material group                                                                                                                                                                                                                                                       | IEC 60664-1   | I                                                                                                                                                                             |
| Contact resistance                                                                                                                                                                                                                                                   | IEC 60512-2-1 | ≤ 5 mΩ                                                                                                                                                                        |
| Insulation resistance                                                                                                                                                                                                                                                | IEC 60512-3-1 | ≥ 10 <sup>10</sup> Ω                                                                                                                                                          |
| Pollution degree                                                                                                                                                                                                                                                     | IEC 60664-1   | 3                                                                                                                                                                             |
| Climatical Characteristics                                                                                                                                                                                                                                           |               |                                                                                                                                                                               |
| Climatic category                                                                                                                                                                                                                                                    |               | 40 / 125 / 21                                                                                                                                                                 |
| Upper temperature                                                                                                                                                                                                                                                    |               | +125°C                                                                                                                                                                        |
| Lower temperature                                                                                                                                                                                                                                                    |               | -40°C                                                                                                                                                                         |
| Mechanical Characteristics                                                                                                                                                                                                                                           |               |                                                                                                                                                                               |
| IP-degree of protection pin module                                                                                                                                                                                                                                   |               | unmated IP00, mated IP20                                                                                                                                                      |
| IP-degree of protection socket module                                                                                                                                                                                                                                |               | unmated IP20, mated IP20                                                                                                                                                      |
| Weight pin module                                                                                                                                                                                                                                                    |               | 18 g                                                                                                                                                                          |
| Weight socket module                                                                                                                                                                                                                                                 |               | 15 g                                                                                                                                                                          |
| Mechanical operation                                                                                                                                                                                                                                                 |               | ≥ 500 mating cycles                                                                                                                                                           |
| Material                                                                                                                                                                                                                                                             |               |                                                                                                                                                                               |
| Module                                                                                                                                                                                                                                                               |               | PA                                                                                                                                                                            |
| Colour module                                                                                                                                                                                                                                                        |               | black                                                                                                                                                                         |
| Contacts                                                                                                                                                                                                                                                             |               | CuZn (brass)                                                                                                                                                                  |
| Contact plating                                                                                                                                                                                                                                                      |               | Ag (silver)                                                                                                                                                                   |
| Derating curves                                                                                                                                                                                                                                                      |               |                                                                                                                                                                               |
| in preparation                                                                                                                                                                                                                                                       |               |                                                                                                                                                                               |
| General requirements                                                                                                                                                                                                                                                 |               |                                                                                                                                                                               |
| <ul style="list-style-type: none"><li>Due to reduced cross sectios at PE contacts of frames, the PE contact has to be additionally protected against short circuits by using a protection circuit offering a sufficiently short breaking time (&lt;0.25s).</li></ul> |               | <ul style="list-style-type: none"><li>Parts to be used as connectors, not as plug devices (connector with breaking capacity). Do not mate under current or voltage!</li></ul> |

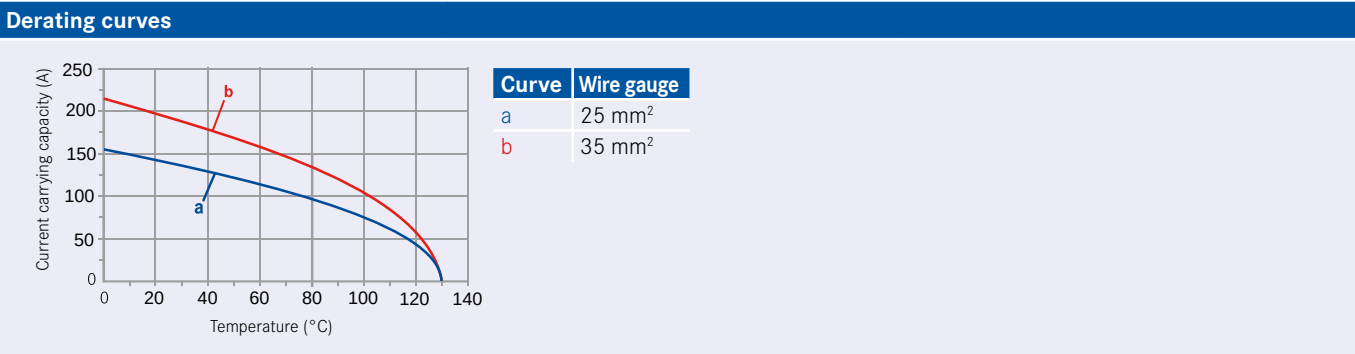
| Description                                                 | Part Number        | Drawing                                                                             | Figure                                                                              |
|-------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>1 contacts module (Please order contacts separately)</b> |                    |                                                                                     |                                                                                     |
| Pin module                                                  | C146 10A001 600 15 |  |  |
| Socket module                                               | C146 10B001 600 15 |  |  |

| Supplied as                    | for wire gauge     | AWG | Pieces | Part Number      |                  | Figure                                                                                |
|--------------------------------|--------------------|-----|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                |                    |     |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 10 mm crimp contacts    |                    |     |        |                  |                  |                                                                                       |
| Single contact                 | 25 mm <sup>2</sup> | 4   | 1      | N01 100 5099 001 | N02 100 6119 002 |   |
|                                | 35 mm <sup>2</sup> | 2   | 1      | N01 100 6000 001 | N02 100 6120 002 |                                                                                       |
|                                | 50 mm <sup>2</sup> | 1   | 1      | N01 100 6001 001 | N02 100 6121 002 |                                                                                       |
|                                | 70 mm <sup>2</sup> | 0   | 1      | N01 100 6002 001 | N02 100 6122 002 |                                                                                       |
|                                | 95 mm <sup>2</sup> | 0   | 1      | N01 100 6003 001 | N02 100 6123 002 |                                                                                       |
| Cable lug for earth connection |                    |     |        |                  |                  |                                                                                       |
| Single contact                 | 16 mm <sup>2</sup> | 6   | 1      | N15 043 0003 003 |                  |  |

| Tools         |                    |                 |               |      |
|---------------|--------------------|-----------------|---------------|------|
| Description   | for wire gauge     | Contact locator | Part number   |      |
| Crimping dies | 25 mm <sup>2</sup> | -               | Crimping dies | Tool |
|               | 35 mm <sup>2</sup> | -               | TE 0600 042   | **   |
|               | 50 mm <sup>2</sup> | -               | TE 0600 022   | **   |
|               | 70 mm <sup>2</sup> | -               | TE 0500 103   | **   |
|               | 95 mm <sup>2</sup> | -               | TE 0500 201   | **   |
|               |                    |                 | TE 0500 301   | **   |

\* = For use in pneumatic crimping tool EK12042L by Klauke or AHPW 400C by Neko.  
Further tools see catalogue "Tools".

| General Characteristics               | Standard      | Value                    |
|---------------------------------------|---------------|--------------------------|
| Number of contacts                    |               | 2                        |
| Termination technique                 |               | crimp                    |
| Wire gauge                            |               | 10 - 35 mm² (AWG 8-2)    |
| Max. wire diameter                    |               | 13 mm                    |
| Flammability                          | UL94          | V-0                      |
| Electrical Characteristics            |               |                          |
| Rated voltage                         | IEC 60664-1   | 1000 V (UL/CSA 600 V)    |
| Rated impulse withstand voltage       | IEC 60664-1   | 8 kV                     |
| Rated Current T <sub>u</sub> = 40 °C  |               | 100 A                    |
| Current carrying capacity             | IEC 60512-5-2 | see derating curves      |
| Installation (overvoltage) category   | IEC 60664-1   | III                      |
| Material group                        | IEC 60664-1   | I                        |
| Contact resistance                    | IEC 60512-2-1 | ≤ 5 mΩ                   |
| Insulation resistance                 | IEC 60512-3-1 | ≥ 10 <sup>10</sup> Ω     |
| Pollution degree                      | IEC 60664-1   | 3                        |
| Climatical Characteristics            |               |                          |
| Climatic category                     |               | 40 / 125 / 21            |
| Upper temperature                     |               | +125°C                   |
| Lower temperature                     |               | -40°C                    |
| Mechanical Characteristics            |               |                          |
| IP-degree of protection pin module    |               | unmated IP00, mated IP20 |
| IP-degree of protection socket module |               | unmated IP20, mated IP20 |
| Weight pin module                     |               | 18 g                     |
| Weight socket module                  |               | 22 g                     |
| Mechanical operation                  |               | ≥ 500 mating cycles      |
| Material                              |               |                          |
| Module                                |               | PA                       |
| Colour module                         |               | black                    |
| Contacts                              |               | CuZn (brass)             |
| Contact plating                       |               | Ag (silver)              |



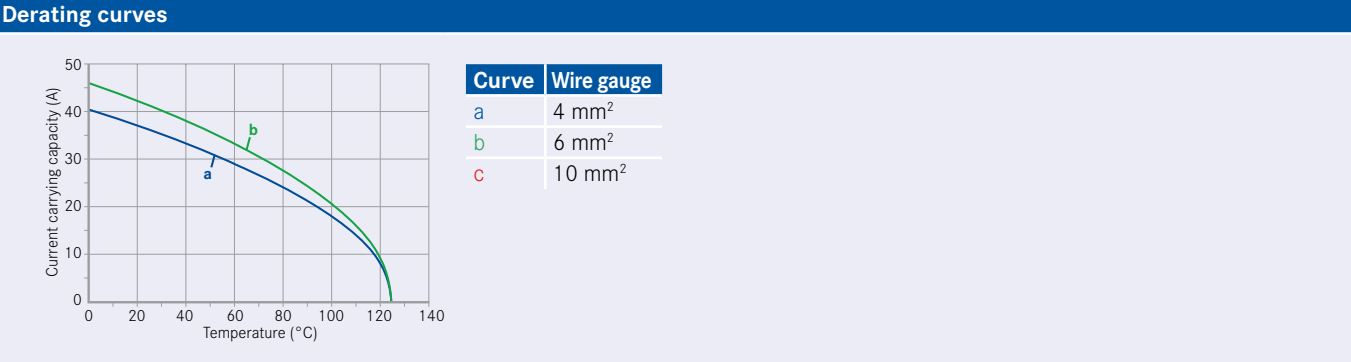
| Description                                                 | Part Number        | Drawing | Figure |
|-------------------------------------------------------------|--------------------|---------|--------|
| <b>2 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 2 contacts                                       | C146 10A002 600 15 |         |        |
| Socket module 2 contacts                                    | C146 10A002 600 15 |         |        |

| Supplied as                              | for wire gauge          | AWG   | Part Number      |                 | Figure                                                                                |
|------------------------------------------|-------------------------|-------|------------------|-----------------|---------------------------------------------------------------------------------------|
|                                          |                         |       | Pin contact      | Socket contact  |                                                                                       |
| Turned 8 mm crimp contact single contact |                         |       |                  |                 |                                                                                       |
| silver plating                           | 10 mm <sup>2</sup>      | 8     | N 01 080 0003 1  | N 02 080 0003 1 |   |
|                                          | 16 mm <sup>2</sup>      | 6     | N 01 080 0004 1  | N 02 080 0004 1 |                                                                                       |
|                                          | 25 mm <sup>2</sup>      | 4     | N 01 080 0005 1  | N 02 080 0005 1 |                                                                                       |
|                                          | 35 mm <sup>2</sup>      | 2     | N 01 080 0006 1  | N 02 080 0006 1 |                                                                                       |
| Cable lug for earth connection           |                         |       |                  |                 |                                                                                       |
| Single contact                           | 10 - 16 mm <sup>2</sup> | 8 - 6 | N15 043 0003 003 |                 |  |

| Tools                                                                                                                   |                |                 |               |                   |
|-------------------------------------------------------------------------------------------------------------------------|----------------|-----------------|---------------|-------------------|
| Description                                                                                                             | for wire gauge | Contact locator | Part Number   |                   |
|                                                                                                                         |                |                 | Crimping dies | Tool              |
| Removal tool for contacts                                                                                               | 10 - 35 mm²    | -               | -             | FG 03000 146 6000 |
| Crimping tool                                                                                                           | 10 mm²         | -               | -             | TB0002            |
|                                                                                                                         | 16 mm²         | -               | TE 0600 062   | *                 |
|                                                                                                                         | 25 mm²         | -               | TE 0600 042   | *                 |
|                                                                                                                         | 35 mm²         | -               | TE 0600 022   | *                 |
| * = For use in pneumatic crimping tool EK12042L by Klauke or AHPW 400C by Neko.<br>Further tools see catalogue "Tools". |                |                 |               |                   |



| General Characteristics               | Standard        | Value                                                      |
|---------------------------------------|-----------------|------------------------------------------------------------|
| Number of contacts                    |                 | 3                                                          |
| Termination technique                 |                 | crimp                                                      |
| Wire gauge                            |                 | 1.5 - 10.0 mm <sup>2</sup> (AWG 16 - 8)                    |
| Max. wire diameter                    |                 | 5.2 / 6.4 mm                                               |
| Flammability                          | UL94            | V-0                                                        |
| Electrical Characteristics            |                 |                                                            |
| Rated voltage                         | IEC 60664-1     | 400 V (conductor - earth)<br>690 V (conductor - conductor) |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                                                       |
| Rated Current T <sub>a</sub> = 40 °C  |                 | 40 A                                                       |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                                        |
| Installation (overvoltage) category   | IEC 60664-1     | III                                                        |
| Material group                        | IEC 60664-1     | I                                                          |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                                     |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                       |
| Pollution degree                      | IEC 60664-1     | 3                                                          |
| Climatical Characteristics            |                 |                                                            |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                                              |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                                     |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                                      |
| Mechanical Characteristics            |                 |                                                            |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20                                   |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20                                   |
| Weight pin module                     |                 | 13 g                                                       |
| Weight socket module                  |                 | 13 g                                                       |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                                        |
| Material                              |                 |                                                            |
| Module                                |                 | PA                                                         |
| Colour module                         |                 | black                                                      |
| Contacts                              |                 | CuZn (brass)                                               |
| Contact plating                       |                 | Ag (silver)                                                |

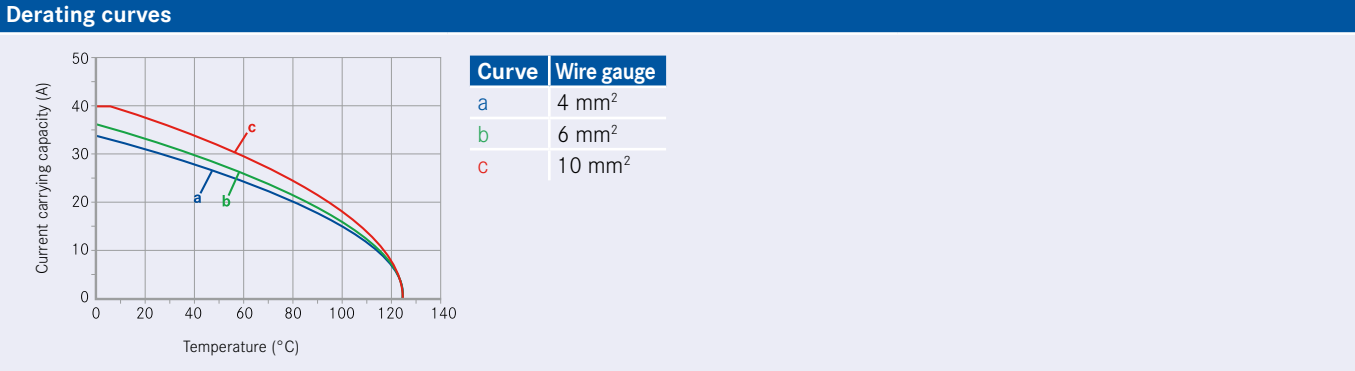


| Description                                                 | Part Number        | Drawing | Figure |
|-------------------------------------------------------------|--------------------|---------|--------|
| <b>3 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 3 contacts                                       |                    |         |        |
| for wire gauge 1.5 - 6 mm <sup>2</sup>                      | C146 10A003 600 15 |         |        |
| for wire gauge 1.5 -10 mm <sup>2</sup>                      | C146 10A003 601 15 |         |        |
| Socket module 3 contacts                                    |                    |         |        |
| for wire gauge 1.5 - 6 mm <sup>2</sup>                      | C146 10B003 600 15 |         |        |
| for wire gauge 1.5 - 10 mm <sup>2</sup>                     | C146 10B003 601 15 |         |        |

| Supplied as                                                  | for wire gauge      | AWG | Pieces | Part Number      |                  | Figure |
|--------------------------------------------------------------|---------------------|-----|--------|------------------|------------------|--------|
|                                                              |                     |     |        | Pin contact      | Socket contact   |        |
| <b>Turned 4 mm<sup>2</sup> crimp contacts single contact</b> |                     |     |        |                  |                  |        |
| silver plating                                               | 1.5 mm <sup>2</sup> | 16  | 100    | VN01 040 0010 1C | VN02 040 0010 1C |        |
|                                                              | 2.5 mm <sup>2</sup> | 14  | 100    | VN01 040 0011 1C | VN02 040 0011 1C |        |
|                                                              | 4 mm <sup>2</sup>   | 12  | 100    | VN01 040 0012 1C | VN02 040 0012 1C |        |
|                                                              | 6 mm <sup>2</sup>   | 10  | 100    | VN01 040 0013 1C | VN02 040 0013 1C |        |
|                                                              | 10 mm <sup>2</sup>  | 8   | 100    | VN01 040 0015 1C | VN02 040 0015 1C |        |

| Tools for 4 mm <sup>2</sup> turned contacts |                          |                 |               |                  |
|---------------------------------------------|--------------------------|-----------------|---------------|------------------|
| Description                                 | for wire gauge           | Contact locator | Part Number   |                  |
|                                             |                          |                 | Crimping dies | Tool             |
| Removal tool for contacts                   | 1.5 - 10 mm <sup>2</sup> | -               | -             | FG 0300 146 5000 |
| 4-Indent crimping tool                      | 1.5 - 10 mm <sup>2</sup> | -               | -             | TB 0700 146      |
| Further tools see catalogue "Tools"         |                          |                 |               |                  |

| Brief information                                              |                 |                                                                            |
|----------------------------------------------------------------|-----------------|----------------------------------------------------------------------------|
| High contact density, receptable- and cable side finger proof. |                 |                                                                            |
| General Characteristics                                        | Standard        | Value                                                                      |
| Number of contacts                                             |                 | 3 + 4                                                                      |
| Termination technique                                          |                 | crimp                                                                      |
| Wire gauge                                                     |                 | Power: 1.5 - 6 mm² (AWG 16 - 10)<br>Signal: 0.14 - 2.5 mm² (AWG 26 - 14)   |
| Max. wire diameter                                             |                 | Power: 6.4 mm, Signal 3.7 mm                                               |
| Flammability                                                   | UL94            | V-0                                                                        |
| Electrical Characteristics                                     |                 |                                                                            |
| Rated voltage                                                  | IEC 60664-1     | Power: 830 V<br>Signal: 690 V (conductor-earth)<br>830 V (conductor-earth) |
| Rated impulse withstand voltage                                | IEC 60664-1     | 8 kV                                                                       |
| Rated Current T <sub>u</sub> = 40 °C                           |                 | Power: 40 A, Signal: 10 A                                                  |
| Current carrying capacity                                      | IEC 60512-5-2   | see derating curves                                                        |
| Installation (overvoltage) category                            | IEC 60664-1     | III                                                                        |
| Material group                                                 | IEC 60664-1     | I                                                                          |
| Contact resistance                                             | IEC 60512-2-1   | ≤ 5 mΩ                                                                     |
| Insulation resistance                                          | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                                       |
| Pollution degree                                               | IEC 60664-1     | 3                                                                          |
| Climatical Characteristics                                     |                 |                                                                            |
| Climatic category                                              | IEC 60068-1     | 40 / 125 / 10                                                              |
| Upper temperature                                              | IEC 60512-11-9  | +125°C                                                                     |
| Lower temperature                                              | IEC 60512-11-10 | -40°C                                                                      |
| Mechanical Characteristics                                     |                 |                                                                            |
| IP-degree of protection pin module                             | IEC 60529       | unmated IP20, mated IP20                                                   |
| IP-degree of protection socket module                          | IEC 60529       | unmated IP20, mated IP20                                                   |
| Weight pin module                                              |                 | 12 g                                                                       |
| Weight socket module                                           |                 | 9 g                                                                        |
| Mechanical operation                                           | IEC 60512-9-1   | ≥ 500 mating cycles                                                        |
| Material                                                       |                 |                                                                            |
| Module                                                         |                 | PA                                                                         |
| Colour module                                                  |                 | black                                                                      |
| Contacts                                                       |                 | CuZn (brass)                                                               |
| Contact plating power                                          |                 | Ag (silver)                                                                |
| Contact plating signal                                         |                 | Ag (silver) / Au (gold)                                                    |



| Description                | Part Number        | Drawing | Figure |
|----------------------------|--------------------|---------|--------|
| <b>GigaBit module</b>      |                    |         |        |
| Pin module 3+4 contacts    | C146 10A007 600 15 |         |        |
| Socket module 3+4 contacts | C146 10B007 600 15 |         |        |

| Supplied as | for wire gauge | AWG | Pieces | Part Number |                | Figure |
|-------------|----------------|-----|--------|-------------|----------------|--------|
|             |                |     |        | Pin contact | Socket contact |        |

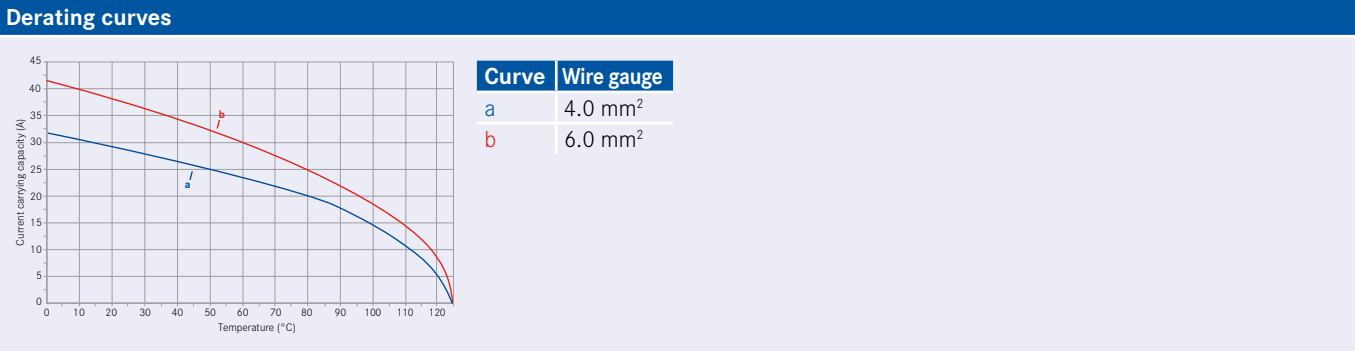
|                                                  |         |    |     |                  |                  |  |
|--------------------------------------------------|---------|----|-----|------------------|------------------|--|
| <b>Turned 4 mm crimp contacts single contact</b> |         |    |     |                  |                  |  |
| silver plating                                   | 1.5 mm² | 16 | 100 | VN01 040 0010 1C | VN02 040 0010 1C |  |
|                                                  | 2.5 mm² | 14 | 100 | VN01 040 0011 1C | VN02 040 0011 1C |  |
|                                                  | 4 mm²   | 12 | 100 | VN01 040 0012 1C | VN02 040 0012 1C |  |
|                                                  | 6 mm²   | 10 | 100 | VN01 040 0013 1C | VN02 040 0013 1C |  |
|                                                  | 10 mm²  | 8  | 100 | VN01 040 0015 1C | VN02 040 0015 1C |  |

|                                                    |                 |         |     |                  |                  |  |
|----------------------------------------------------|-----------------|---------|-----|------------------|------------------|--|
| <b>Turned 1.6 mm crimp contacts single contact</b> |                 |         |     |                  |                  |  |
| silver plating                                     | 0.14 - 0.37 mm² | 26 - 22 | 100 | VN01 016 0024 1C | VN02 016 0024 1C |  |
|                                                    | 0.5 mm²         | 20      | 100 | VN01 016 0025 1C | VN02 016 0025 1C |  |
|                                                    | 0.75 - 1.0 mm²  | 18      | 100 | VN01 016 0026 1C | VN02 016 0026 1C |  |
|                                                    | 1.5 mm²         | 16      | 100 | VN01 016 0027 1C | VN02 016 0027 1C |  |
|                                                    | 2.5 mm²         | 14      | 100 | VN01 016 0028 1C | VN02 016 0028 1C |  |
| gold plating                                       | 0.14 - 0.37 mm² | 26 - 22 | 100 | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                                                    | 0.5 mm²         | 20      | 100 | VN01 016 0025 2C | VN02 016 0025 2C |  |
|                                                    | 0.75 - 1.0 mm²  | 18      | 100 | VN01 016 0026 2C | VN02 016 0026 2C |  |
|                                                    | 1.5 mm²         | 16      | 100 | VN01 016 0027 2C | VN02 016 0027 2C |  |
|                                                    | 2.5 mm²         | 14      | 100 | VN01 016 0028 2C | VN02 016 0028 2C |  |

| Tools for 4 mm² turned contacts                              |                |                  |             |                    |
|--------------------------------------------------------------|----------------|------------------|-------------|--------------------|
| Description                                                  | for wire gauge | Part number      |             |                    |
|                                                              |                | Contact locator  | Test pin    | Tool               |
| Removal tools for signal contacts                            | 0.14 - 2,5 mm² | -                | -           | FG 0300 146 1      |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2,5 mm² | TA 0010 146 0001 | TA 0000 184 | TA 0000 or TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 2,5 mm² | -                | -           | TB 0400 146        |
| 4-Indent crimping tool                                       | 1,5 - 10 mm²   | -                | -           | TB 0700 146        |
| Further tools see catalogue "Tools"                          |                |                  |             |                    |



| General Characteristics               | Standard        | Value                     |
|---------------------------------------|-----------------|---------------------------|
| Number of contacts                    |                 | 4                         |
| Termination technique                 |                 | crimp                     |
| Wire gauge                            |                 | 1.5 - 6.0 mm² (AWG 16-10) |
| Max. wire diameter                    |                 | 5.2 mm                    |
| Flammability                          | UL94            | V-0                       |
| Electrical Characteristics            |                 |                           |
| Rated voltage                         | IEC 60664-1     | 830 V (UL/CSA 600 V)      |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                      |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 40 A                      |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves       |
| Installation (overvoltage) category   | IEC 60664-1     | III                       |
| Material group                        | IEC 60664-1     | I                         |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                    |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω      |
| Pollution degree                      | IEC 60664-1     | 3                         |
| Climatical Characteristics            |                 |                           |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21             |
| Upper temperature                     | IEC 60512-11-9  | +125°C                    |
| Lower temperature                     | IEC 60512-11-10 | -40°C                     |
| Mechanical Characteristics            |                 |                           |
| IP-degree of protection pin module    | IEC 60529       | unmated IP20, mated IP20  |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20  |
| Weight pin module                     |                 | 13 g                      |
| Weight socket module                  |                 | 10 g                      |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles       |
| Material                              |                 |                           |
| Module                                |                 | PA                        |
| Colour module                         |                 | black                     |
| Contacts                              |                 | CuZn (brass)              |
| Contact plating                       |                 | Ag (silver)               |

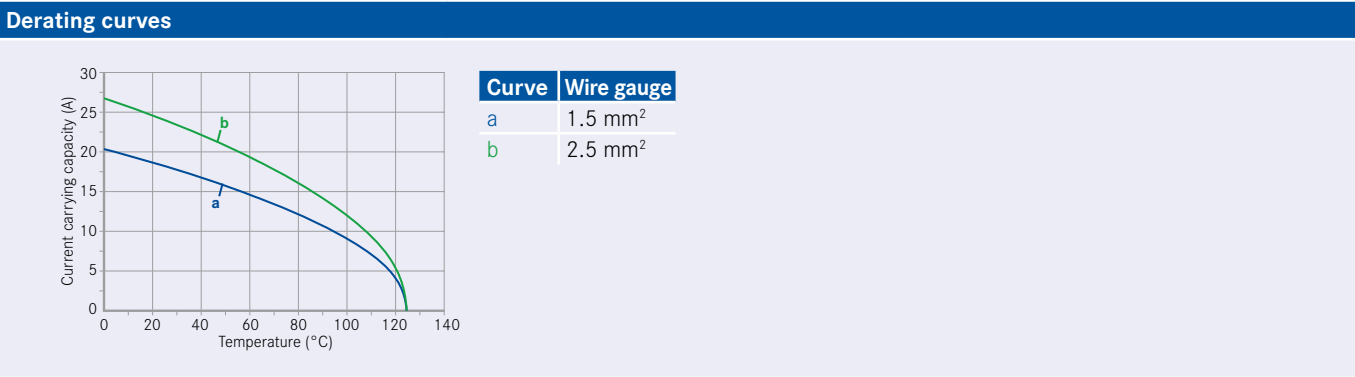


| Description                                                 | Part Number        | Drawing | Figure |
|-------------------------------------------------------------|--------------------|---------|--------|
| <b>4 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 4 contacts                                       | C146 10A004 600 15 |         |        |
| Socket module 4 contacts                                    | C146 10B004 600 15 |         |        |

| Supplied as                                      | for wire gauge | AWG | Pieces | Part Number      |                  | Figure |
|--------------------------------------------------|----------------|-----|--------|------------------|------------------|--------|
|                                                  |                |     |        | Pin contact      | Socket contact   |        |
| <b>Turned 4 mm crimp contacts single contact</b> |                |     |        |                  |                  |        |
| silver plating                                   | 1.5 mm²        | 16  | 100    | VN01 040 0010 1C | VN02 040 0010 1C |        |
|                                                  | 2.5 mm²        | 14  | 100    | VN01 040 0011 1C | VN02 040 0011 1C |        |
|                                                  | 4 mm²          | 12  | 100    | VN01 040 0012 1C | VN02 040 0012 1C |        |
|                                                  | 6 mm²          | 10  | 100    | VN01 040 0013 1C | VN02 040 0013 1C |        |

| Tools for 4 mm² turned contacts      |                |                 |          |                  |
|--------------------------------------|----------------|-----------------|----------|------------------|
| Description                          | for wire gauge | Part Number     |          |                  |
|                                      |                | Contact locator | Test pin | Tool             |
| Removal tool for contacts            | 1.5 - 6mm²     | -               | -        | FG 0300 146 5000 |
| 4-Indent crimping tool <sup>1)</sup> | 1.5 - 6mm²     | -               | -        | TB 0700 146      |
| Further tools see catalogue "Tools"  |                |                 |          |                  |

| General Characteristics               | Standard        | Value                      |
|---------------------------------------|-----------------|----------------------------|
| Number of contacts                    |                 | 6                          |
| Termination technique                 |                 | crimp                      |
| Wire gauge                            |                 | 0.14 - 4.0 mm² (AWG 26-12) |
| Max. wire diameter                    |                 | 4.6 mm                     |
| Flammability                          | UL94            | V-0                        |
| Electrical Characteristics            |                 |                            |
| Rated voltage                         | IEC 60664-1     | 630 V (UL/CSA 600 V)       |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                       |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 16 A                       |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves        |
| Installation (overvoltage) category   | IEC 60664-1     | III                        |
| Material group                        | IEC 60664-1     | I                          |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                     |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω       |
| Pollution degree                      | IEC 60664-1     | 3                          |
| Climatical Characteristics            |                 |                            |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21              |
| Upper temperature                     | IEC 60512-11-9  | +125°C                     |
| Lower temperature                     | IEC 60512-11-10 | -40°C                      |
| Mechanical Characteristics            |                 |                            |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20   |
| IP-degree of protection socket module | IEC 60529       | unmated IP00, mated IP20   |
| Weight pin module                     |                 | 10 g                       |
| Weight socket module                  |                 | 10 g                       |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles        |
| Material                              |                 |                            |
| Module                                |                 | PA                         |
| Colour module                         |                 | black                      |
| Contacts                              |                 | CuZn (brass)               |
| Contact plating                       |                 | Ag (silver) / Au (gold)    |



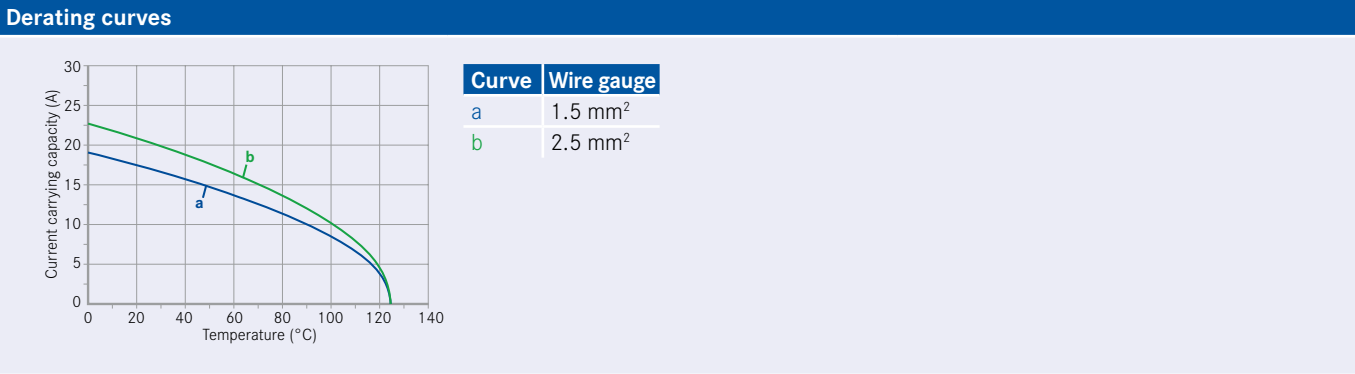
| Description                                                 | Part Number        | Drawing | Figure |
|-------------------------------------------------------------|--------------------|---------|--------|
| <b>6 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 6 contacts                                       | C146 10A006 600 15 |         |        |
| Socket module 6 contacts                                    | C146 10B006 600 15 |         |        |

| Supplied as                                        | for wire gauge  | AWG     | Pieces | Part Number      |                  | Figure |
|----------------------------------------------------|-----------------|---------|--------|------------------|------------------|--------|
|                                                    |                 |         |        | Pin contact      | Socket contact   |        |
| <b>Turned 2.5 mm crimp contacts single contact</b> |                 |         |        |                  |                  |        |
| silver plating                                     | 0.14 - 0.37 mm² | 26 - 22 | 100    | VN01 025 0055 1C | VN02 025 0055 1C |        |
|                                                    | 0.5 mm²         | 20      | 100    | VN01 025 0035 1C | VN02 025 0035 1C |        |
|                                                    | 0.75 - 1.0 mm²  | 18      | 100    | VN01 025 0036 1C | VN02 025 0036 1C |        |
|                                                    | 1.5 mm²         | 16      | 100    | VN01 025 0037 1C | VN02 025 0037 1C |        |
|                                                    | 2.5 mm²         | 14      | 100    | VN01 025 0038 1C | VN02 025 0038 1C |        |
|                                                    | 3.0 mm²         | -       | 100    | VN01 025 0059 1C | VN02 025 0059 1C |        |
|                                                    | 4.0 mm²         | 12      | 100    | VN01 025 0039 1C | VN02 025 0039 1C |        |
| gold plating                                       | 0.14 - 0.37 mm² | 26 - 22 | 100    | VN01 025 0055 2C | VN02 025 0055 2C |        |
|                                                    | 0.5 mm²         | 20      | 100    | VN01 025 0035 2C | VN02 025 0035 2C |        |
|                                                    | 0.75 - 1.0 mm²  | 18      | 100    | VN01 025 0036 2C | VN02 025 0036 2C |        |
|                                                    | 1.5 mm²         | 16      | 100    | VN01 025 0037 2C | VN02 025 0037 2C |        |
|                                                    | 2.5 mm²         | 14      | 100    | VN01 025 0038 2C | VN02 025 0038 2C |        |
|                                                    | 3.0 mm²         | -       | 100    | VN01 025 0059 2C | VN02 025 0059 2C |        |
|                                                    | 4.0 mm²         | 12      | 100    | VN01 025 0039 2C | VN02 025 0039 2C |        |

| Tools for turned contacts                                    |                                                   |                                                             |                                           |                       |
|--------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------|-------------------------------------------|-----------------------|
| Description                                                  | for wire gauge                                    | Contact locator                                             | Part Number                               |                       |
|                                                              |                                                   |                                                             | Crimping dies                             | Tool                  |
| Removal tool for contacts                                    | 0.14 - 4.0 mm²                                    | -                                                           | -                                         | FG 0300 146 7         |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 0.37 mm²<br>0.5 - 2.5 mm²<br>3.0 - 4.0 mm² | TA 0010 146 000 6<br>TA 0010 146 000 7<br>TA 0010 146 000 7 | TA 0000 144<br>TA 0000 124<br>TA 0000 124 | TA 0000 or<br>TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 4.0 mm²                                    | -                                                           | -                                         | TB 0600 146           |
| Further tools see catalogue "Tools"                          |                                                   |                                                             |                                           |                       |



| General Characteristics               | Standard        | Value                      |
|---------------------------------------|-----------------|----------------------------|
| Number of contacts                    |                 | 8                          |
| Termination technique                 |                 | crimp                      |
| Wire gauge                            |                 | 0.14 - 4.0 mm² (AWG 26-12) |
| Max. wire diameter                    |                 | 4.6 mm                     |
| Flammability                          | UL94            | V-0                        |
| Electrical Characteristics            |                 |                            |
| Rated voltage                         | IEC 60664-1     | 400 V (UL/CSA 600 V)       |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                       |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 16 A                       |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves        |
| Installation (overvoltage) category   | IEC 60664-1     | III                        |
| Material group                        | IEC 60664-1     | I                          |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                     |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω       |
| Pollution degree                      | IEC 60664-1     | 3                          |
| Climatical Characteristics            |                 |                            |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21              |
| Upper temperature                     | IEC 60512-11-9  | +125°C                     |
| Lower temperature                     | IEC 60512-11-10 | -40°C                      |
| Mechanical Characteristics            |                 |                            |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20   |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20   |
| Weight pin module                     |                 | 9 g                        |
| Weight socket module                  |                 | 10 g                       |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles        |
| Material                              |                 |                            |
| Module                                |                 | PA                         |
| Colour module                         |                 | black                      |
| Contacts                              |                 | CuZn (brass)               |
| Contact plating                       |                 | Ag (silver) / Au (gold)    |



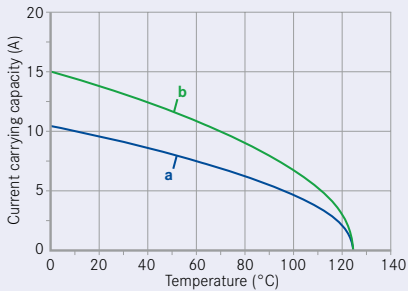
| Description                                                 | Part Number        | Drawing | Figure |
|-------------------------------------------------------------|--------------------|---------|--------|
| <b>8 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 8 contacts                                       | C146 10A008 600 15 |         |        |
| Socket module 8 contacts                                    | C146 10B008 600 15 |         |        |

| Supplied as                                        | for wire gauge  | AWG     | Pieces | Part Number      |                  | Figure |
|----------------------------------------------------|-----------------|---------|--------|------------------|------------------|--------|
|                                                    |                 |         |        | Pin contact      | Socket contact   |        |
| <b>Turned 2.5 mm crimp contacts single contact</b> |                 |         |        |                  |                  |        |
| silver plating                                     | 0.14 - 0.37 mm² | 26 - 22 | 100    | VN01 025 0055 1C | VN02 025 0055 1C |        |
|                                                    | 0.5 mm²         | 20      | 100    | VN01 025 0035 1C | VN02 025 0035 1C |        |
|                                                    | 0.75 - 1.0 mm²  | 18      | 100    | VN01 025 0036 1C | VN02 025 0036 1C |        |
|                                                    | 1.5 mm²         | 16      | 100    | VN01 025 0037 1C | VN02 025 0037 1C |        |
|                                                    | 2.5 mm²         | 14      | 100    | VN01 025 0038 1C | VN02 025 0038 1C |        |
|                                                    | 3.0 mm²         | -       | 100    | VN01 025 0059 1C | VN02 025 0059 1C |        |
|                                                    | 4.0 mm²         | 12      | 100    | VN01 025 0039 1C | VN02 025 0039 1C |        |
| gold plating                                       | 0.14 - 0.37 mm² | 26 - 22 | 100    | VN01 025 0055 2C | VN02 025 0055 2C |        |
|                                                    | 0.5 mm²         | 20      | 100    | VN01 025 0035 2C | VN02 025 0035 2C |        |
|                                                    | 0.75 - 1.0 mm²  | 18      | 100    | VN01 025 0036 2C | VN02 025 0036 2C |        |
|                                                    | 1.5 mm²         | 16      | 100    | VN01 025 0037 2C | VN02 025 0037 2C |        |
|                                                    | 2.5 mm²         | 14      | 100    | VN01 025 0038 2C | VN02 025 0038 2C |        |
|                                                    | 3.0 mm²         | -       | 100    | VN01 025 0059 2C | VN02 025 0059 2C |        |
|                                                    | 4.0 mm²         | 12      | 100    | VN01 025 0039 2C | VN02 025 0039 2C |        |

| Tools for turned contacts                                    |                 |                   |               |                    |
|--------------------------------------------------------------|-----------------|-------------------|---------------|--------------------|
| Description                                                  | for wire gauge  | Part Number       |               |                    |
|                                                              |                 | Contact locator   | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.14 - 4.0 mm²  | -                 | -             | FG 0300 146 7      |
| Standard crimping tool and accessories for 4-indent crimping | 0.14 - 0.37 mm² | TA 0010 146 000 6 | TA 0000 144   | TA 0000 or TA 0500 |
|                                                              | 0.5 - 2.5 mm²   | TA 0010 146 000 7 | TA 0000 124   |                    |
|                                                              | 3.0 - 4.0 mm²   | TA 0010 146 000 7 | TA 0000 124   |                    |
| 4-indent crimping tool                                       | 0.14 - 4.0 mm²  | -                 | -             | TB 0600 146        |
| Further tools see catalogue “Tools”                          |                 |                   |               |                    |

| General Characteristics               | Standard        | Value                                                                        |
|---------------------------------------|-----------------|------------------------------------------------------------------------------|
| Number of contacts                    |                 | 12                                                                           |
| Termination technique                 |                 | crimp, PCB (in combination with PCB adaptor)                                 |
| Wire gauge                            |                 | 0.14 - 2.5 mm² (AWG 26-14)                                                   |
| Max. wire diameter                    |                 | 3.7 mm                                                                       |
| Flammability                          | UL94            | V-0                                                                          |
| Electrical Characteristics            |                 |                                                                              |
| Rated voltage                         | IEC 60664-1     | 250 V (conductor – earth)<br>400 V (conductor – conductor)<br>(UL/CSA 600 V) |
| Rated impulse withstand voltage       | IEC 60664-1     | 4 kV                                                                         |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 10 A                                                                         |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                                                          |
| Installation (overvoltage) category   | IEC 60664-1     | III                                                                          |
| Material group                        | IEC 60664-1     | I                                                                            |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                                                       |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                                         |
| Pollution degree                      | IEC 60664-1     | 3                                                                            |
| Climatical Characteristics            |                 |                                                                              |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                                                                |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                                                       |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                                                        |
| Mechanical Characteristics            |                 |                                                                              |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20                                                     |
| IP-degree of protection socket module | IEC 60529       | unmated IP00, mated IP20                                                     |
| Weight pin module                     |                 | 11 g                                                                         |
| Weight socket module                  |                 | 11 g                                                                         |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                                                          |
| Material                              |                 |                                                                              |
| Module                                |                 | PA                                                                           |
| Colour module                         |                 | black                                                                        |
| Contacts                              |                 | CuZn (brass)                                                                 |
| Contact plating                       |                 | Ag (silver) / Au (gold)                                                      |

Derating curves



| Curve | Wire gauge |
|-------|------------|
| a     | 1.0 mm²    |
| b     | 1.5 mm²    |

| Description                                                  | Part Number        | Drawing | Figure |
|--------------------------------------------------------------|--------------------|---------|--------|
| <b>12 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 12 contacts                                       | C146 10A012 600 15 |         |        |
| Socket module 12 contacts                                    | C146 10B012 600 15 |         |        |

6 contacts PCB adaptor

|                                          |                    |                                                                                      |
|------------------------------------------|--------------------|--------------------------------------------------------------------------------------|
| PCB Adaptor 6 contacts                   | C146 10B006 300 15 |   |
| PCB contact gold plating<br>(100 Pieces) | VN01 016 0057 3C   |  |
|                                          | VN02 016 0057 3C   |                                                                                      |

| Supplied as | for wire gauge | AWG | Pieces | Part Number |                | Figure |
|-------------|----------------|-----|--------|-------------|----------------|--------|
|             |                |     |        | Pin contact | Socket contact |        |

Turned crimp contacts single contact

|                |                 |         |     |                  |                  |  |
|----------------|-----------------|---------|-----|------------------|------------------|--|
| silver plating | 0.14 - 0.37 mm² | 26-22   | 100 | VN01 016 0024 1C | VN02 016 0024 1C |  |
|                | 0.5 mm²         | 20      | 100 | VN01 016 0025 1C | VN02 016 0025 1C |  |
|                | 0.75 - 1.0 mm²  | 18      | 100 | VN01 016 0026 1C | VN02 016 0026 1C |  |
|                | 1.5 mm²         | 16      | 100 | VN01 016 0027 1C | VN02 016 0027 1C |  |
|                | 2.5 mm²         | 14      | 100 | VN01 016 0028 1C | VN02 016 0028 1C |  |
| gold plating   | 0.14 - 0.37 mm² | 26 - 22 | 100 | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                | 0.5 mm²         | 20      | 100 | VN01 016 0025 2C | VN02 016 0025 2C |  |
|                | 0.75 - 1.0 mm²  | 18      | 100 | VN01 016 0026 2C | VN02 016 0026 2C |  |
|                | 1.5 mm²         | 16      | 100 | VN01 016 0027 2C | VN02 016 0027 2C |  |
|                | 2.5 mm²         | 14      | 100 | VN01 016 0028 2C | VN02 016 0028 2C |  |

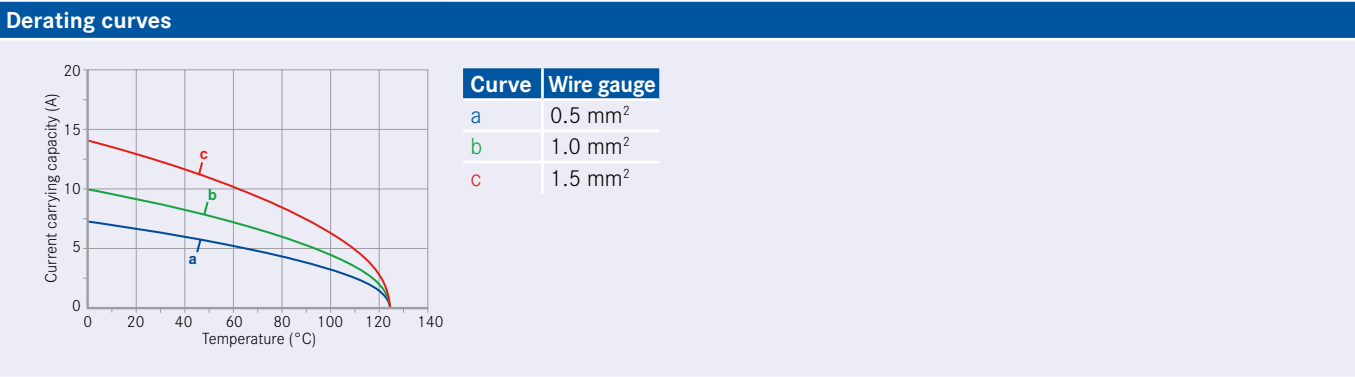
Tools for turned contacts

| Description                                                  | for wire gauge | Contact locator   | Part Number   |   | Tool               |
|--------------------------------------------------------------|----------------|-------------------|---------------|---|--------------------|
|                                                              |                |                   | Crimping dies |   |                    |
| Removal tool for contacts                                    | 0.14 - 2.5 mm² | -                 | -             | - | FG 0300 146 1      |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2.5 mm² | TA 00100 146 0001 | TA 0000 184   | - | TA 0000 or TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 2.5 mm² | —                 | -             | - | TB 0400 146        |

Further tools see catalogue “Tools”



| General Characteristics               | Standard        | Value                        |
|---------------------------------------|-----------------|------------------------------|
| Number of contacts                    |                 | 17                           |
| Termination technique                 |                 | crimp                        |
| Wire gauge                            |                 | 0.14 - 2.5 mm² (AWG 26 - 14) |
| Max. wire diameter                    |                 | 3.7 mm                       |
| Flammability                          | UL94            | V-0                          |
| Electrical Characteristics            |                 |                              |
| Rated voltage                         | IEC 60664-1     | 160 V (UL/CSA 250 V)         |
| Rated impulse withstand voltage       | IEC 60664-1     | 2.5 kV                       |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 10 A                         |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves          |
| Installation (overvoltage) category   | IEC 60664-1     | III                          |
| Material group                        | IEC 60664-1     | I                            |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                       |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω         |
| Pollution degree                      | IEC 60664-1     | 3                            |
| Climatical Characteristics            |                 |                              |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                |
| Upper temperature                     | IEC 60512-11-9  | +125°C                       |
| Lower temperature                     | IEC 60512-11-10 | -40°C                        |
| Mechanical Characteristics            |                 |                              |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20     |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20     |
| Weight pin module                     |                 | 9 g                          |
| Weight socket module                  |                 | 11 g                         |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles          |
| Material                              |                 |                              |
| Module                                |                 | PA                           |
| Colour module                         |                 | black                        |
| Contacts                              |                 | CuZn (brass)                 |
| Contact plating                       |                 | Ag (silver) / Au (gold)      |

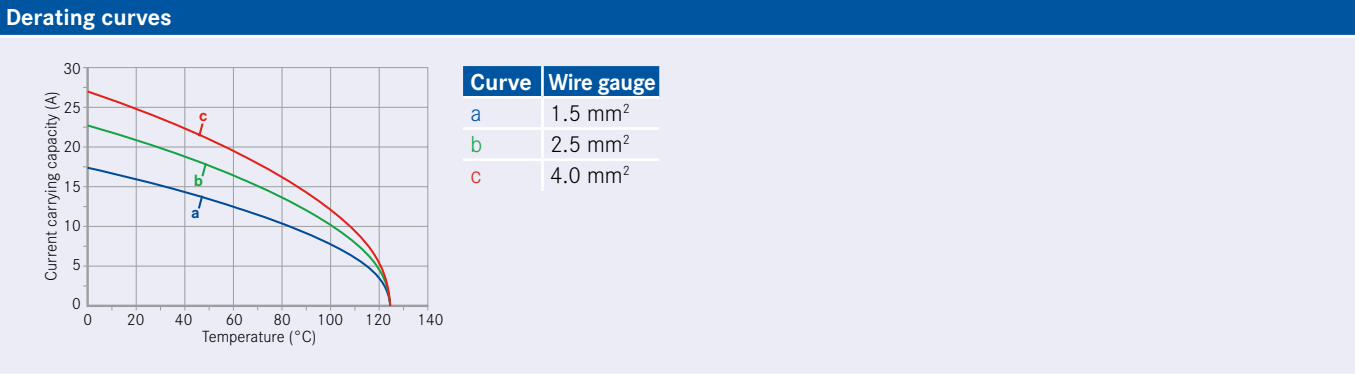


| Description                                                  | Part Number        | Drawing | Figure |
|--------------------------------------------------------------|--------------------|---------|--------|
| <b>17 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 17 contacts                                       | C146 10A017 600 15 |         |        |
| Socket module 17 contacts                                    | C146 10B017 600 15 |         |        |

| Supplied as                          | for wire gauge              | AWG     | Pieces | Part Number      |                  | Figure                                                                                |
|--------------------------------------|-----------------------------|---------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                      |                             |         |        | Pin contact      | Socket contact   |                                                                                       |
| Turned crimp contacts single contact |                             |         |        |                  |                  |                                                                                       |
| silver plating                       | 0.14 – 0.37 mm <sup>2</sup> | 26 – 22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |   |
|                                      | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 016 0025 1C | VN02 016 0025 1C |                                                                                       |
|                                      | 0.75 – 1.0 mm <sup>2</sup>  | 18      | 100    | VN01 016 0026 1C | VN02 016 0026 1C |                                                                                       |
|                                      | 1.5 mm <sup>2</sup>         | 16      | 100    | VN01 016 0027 1C | VN02 016 0027 1C |                                                                                       |
|                                      | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 016 0028 1C | VN02 016 0028 1C |                                                                                       |
| gold plating                         | 0.14 – 0.37 mm <sup>2</sup> | 26 – 22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                                      | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 016 0025 2C | VN02 016 0025 2C |                                                                                       |
|                                      | 0.75 – 1.0 mm <sup>2</sup>  | 18      | 100    | VN01 016 0026 2C | VN02 016 0026 2C |                                                                                       |
|                                      | 1.5 mm <sup>2</sup>         | 16      | 100    | VN01 016 0027 2C | VN02 016 0027 2C |                                                                                       |
|                                      | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 016 0028 2C | VN02 016 0028 2C |                                                                                       |

| Tools for turned contacts                                    |                |                   |               |                    |
|--------------------------------------------------------------|----------------|-------------------|---------------|--------------------|
| Description                                                  | for wire gauge | Contact locator   | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.14 - 2.5 mm² | -                 | -             | FG 0300 146 1      |
| Standard crimping tool and accessories for 4-indent crimping | 0.14 - 0.5 mm² | TA 00100 146 0001 | TA 0000 184   | TA 0000 or TA 0500 |
| 4-indent crimping tool                                       | 0.14 - 0.5 mm² | -                 | -             | TB 0400 146        |
| Further tools see catalogue "Tools"                          |                |                   |               |                    |

| General Characteristics               | Standard        | Value                                    |
|---------------------------------------|-----------------|------------------------------------------|
| Number of contacts                    |                 | 20                                       |
| Termination technique                 |                 | crimp                                    |
| Wire gauge                            |                 | 0.14 - 4.0 mm <sup>2</sup> (AWG 26 - 12) |
| Max. wire diameter                    |                 | 4.6 mm                                   |
| Flammability                          | UL94            | V-0                                      |
| Electrical Characteristics            |                 |                                          |
| Rated voltage                         | IEC 60664-1     | 500 V (UL/CSA 600 V)                     |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                                     |
| Rated Current T <sub>v</sub> = 40 °C  |                 | 16 A                                     |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                      |
| Installation (overvoltage) category   | IEC 60664-1     | III                                      |
| Material group                        | IEC 60664-1     | I                                        |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                   |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                     |
| Pollution degree                      | IEC 60664-1     | 3                                        |
| Climatical Characteristics            |                 |                                          |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                            |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                   |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                    |
| Mechanical Characteristics            |                 |                                          |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20                 |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20                 |
| Weight pin module                     |                 | 18 g                                     |
| Weight socket module                  |                 | 23 g                                     |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                      |
| Material                              |                 |                                          |
| Module                                |                 | PA                                       |
| Colour module                         |                 | black                                    |
| Contacts                              |                 | CuZn (brass)                             |
| Contact plating                       |                 | Ag (silver) / Au (gold)                  |



| Description                                                  | Part Number        | Drawing | Figure |
|--------------------------------------------------------------|--------------------|---------|--------|
| <b>20 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 20 contacts                                       | C146 10A020 600 15 |         |        |
| Socket module 20 contacts                                    | C146 10B020 600 15 |         |        |

| Supplied as                                        | for wire gauge              | AWG     | Pieces | Part Number      |                  | Figure |
|----------------------------------------------------|-----------------------------|---------|--------|------------------|------------------|--------|
|                                                    |                             |         |        | Pin contact      | Socket contact   |        |
| <b>Turned 2.5 mm crimp contacts single contact</b> |                             |         |        |                  |                  |        |
| silver plating                                     | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22 | 100    | VN01 025 0055 1C | VN02 025 0055 1C |        |
|                                                    | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 025 0035 1C | VN02 025 0035 1C |        |
|                                                    | 0.75 - 1.0 mm <sup>2</sup>  | 18      | 100    | VN01 025 0036 1C | VN02 025 0036 1C |        |
|                                                    | 1.5 mm <sup>2</sup>         | 16      | 100    | VN01 025 0037 1C | VN02 025 0037 1C |        |
|                                                    | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 025 0038 1C | VN02 025 0038 1C |        |
|                                                    | 3.0 mm <sup>2</sup>         | -       | 100    | VN01 025 0059 1C | VN02 025 0059 1C |        |
|                                                    | 4.0 mm <sup>2</sup>         | 12      | 100    | VN01 025 0039 1C | VN02 025 0039 1C |        |
| gold plating                                       | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22 | 100    | VN01 025 0055 2C | VN02 025 0055 2C |        |
|                                                    | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 025 0035 2C | VN02 025 0035 2C |        |
|                                                    | 0.75 - 1.0 mm <sup>2</sup>  | 18      | 100    | VN01 025 0036 2C | VN02 025 0036 2C |        |
|                                                    | 1.5 mm <sup>2</sup>         | 16      | 100    | VN01 025 0037 2C | VN02 025 0037 2C |        |
|                                                    | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 025 0038 2C | VN02 025 0038 2C |        |
|                                                    | 3.0 mm <sup>2</sup>         | -       | 100    | VN01 025 0059 2C | VN02 025 0059 2C |        |
|                                                    | 4.0 mm <sup>2</sup>         | 12      | 100    | VN01 025 0039 2C | VN02 025 0039 2C |        |

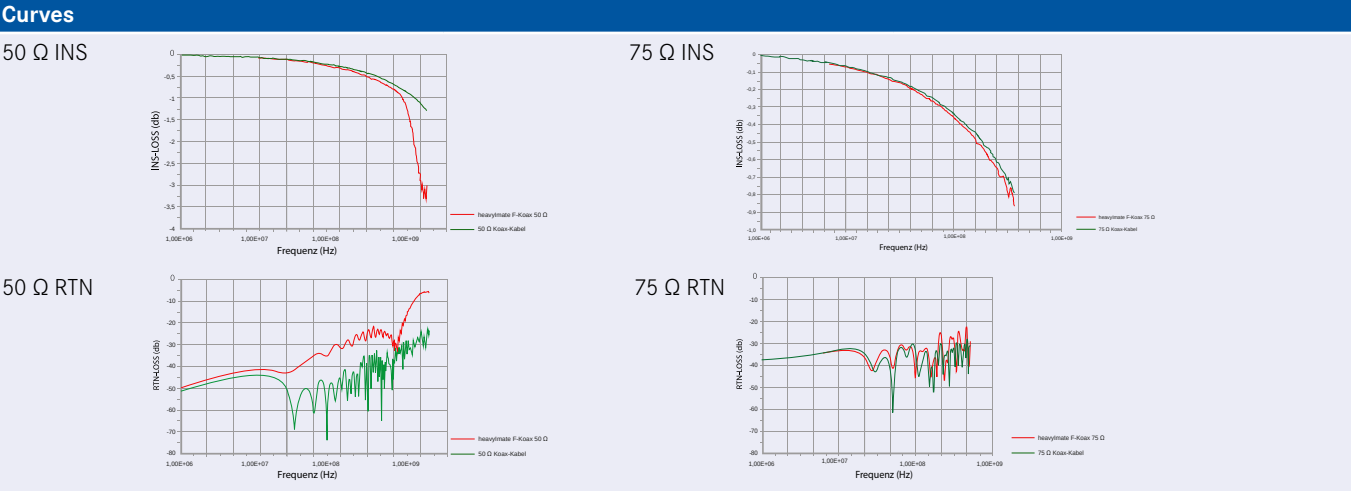
| Tools for turned contacts                                    |                                                                                       |                                                             |                                           |                       |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------|-----------------------|
| Description                                                  | for wire gauge                                                                        | Contact locator                                             | Part Number                               |                       |
|                                                              |                                                                                       |                                                             | Crimping dies                             | Tool                  |
| Removal tool for contacts                                    | 0.14 - 4.0 mm <sup>2</sup>                                                            | -                                                           | -                                         | FG 0300 146 7         |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 0.37 mm <sup>2</sup><br>0.5 - 2.5 mm <sup>2</sup><br>3.0 - 4.0 mm <sup>2</sup> | TA 0010 146 000 6<br>TA 0010 146 000 7<br>TA 0010 146 000 7 | TA 0000 144<br>TA 0000 124<br>TA 0000 124 | TA 0000 or<br>TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 4.0 mm <sup>2</sup>                                                            | -                                                           | -                                         | TB 0600 146           |
| Further tools see catalogue "Tools"                          |                                                                                       |                                                             |                                           |                       |



| Brief information                                                         |                               |                              |   |
|---------------------------------------------------------------------------|-------------------------------|------------------------------|---|
| CAT 5e for Ethernet acc. ISO/IEC 11801, for 10/100/1000 MBit/s data rate. |                               |                              |   |
| General Characteristics                                                   | Standard                      | Value                        |   |
| Number of contacts                                                        |                               | 4 + shielding                | 1 |
| Termination technique                                                     |                               | crimp                        |   |
| Wire gauge                                                                |                               | 0.14 - 2.5 mm² (AWG 26 - 14) |   |
| Max. wire diameter                                                        |                               | 3 - 9.5 mm                   |   |
| Flammability                                                              | UL94                          | V-0                          |   |
| Electrical Characteristics                                                |                               |                              |   |
| Rated voltage                                                             | IEC 60664-1                   | 50 V (UL/CSA 50 V)           |   |
| Rated impulse withstand voltage                                           | IEC 60664-1                   | 0.8 kV                       |   |
| Rated current T <sub>u</sub> =40°C                                        |                               | 10 A                         |   |
| Installation (overvoltage) category                                       | IEC 60664-1                   | III                          |   |
| Material group                                                            | IEC 60664-1                   | I                            |   |
| Contact resistance                                                        | IEC 60512-2-1                 | ≤ 5 mΩ                       |   |
| Insulation resistance                                                     |                               | ≤ 10 <sup>10</sup> mΩ        |   |
| Category of connection                                                    | IEC 11801 ANSI/TIA/EIA-568-C2 | CAT5e                        |   |
| Data rate                                                                 |                               | max. 1 GBit/s                |   |
| Pollution degree                                                          | IEC 60664-1                   | 3                            |   |
| Climatical Characteristics                                                |                               |                              |   |
| Climatic category                                                         | IEC 60068-1                   | 40 / 100 / 21                |   |
| Upper temperature                                                         | IEC 60512-11-9                | +100°C                       |   |
| Lower temperature                                                         | IEC 60512-11-10               | -40°C                        |   |
| Mechanical Characteristics                                                |                               |                              |   |
| IP-degree of protection module                                            |                               | unmated IP00, mated IP20     |   |
| IP-degree of protection socket module                                     |                               | unmated IP00, mated IP20     |   |
| Weight pin contact carrier                                                |                               | 50 g                         |   |
| Weight socket contact carrier                                             |                               | 40 g                         |   |
| Weight pin module                                                         |                               | 13 g                         |   |
| Weight socket module                                                      |                               | 15 g                         |   |
| Mechanical operation                                                      | IEC 60512-9-1                 | ≥ 500 mating cycles          |   |
| Material                                                                  |                               |                              |   |
| Module                                                                    |                               | PA                           |   |
| Colour module                                                             |                               | black                        |   |
| Contacts                                                                  |                               | CuZn (brass)                 |   |
| Contact plating                                                           |                               | Au (gold)                    |   |
| Contact insert                                                            |                               | PA                           |   |
| Colour contact insert                                                     |                               | black                        |   |
| Shielding                                                                 |                               | Zink alloy                   |   |
| Cable clamp                                                               |                               | Zink alloy                   |   |

| Description                                                           | Part number                                                                 | Drawing | Figure |                  |                  |        |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------|---------|--------|------------------|------------------|--------|
| Adaptor modules                                                       |                                                                             |         |        |                  |                  |        |
| Pin module                                                            | C146 10A002 800 15                                                          |         |        |                  |                  |        |
| Socket module                                                         | C146 10B002 800 15                                                          |         |        |                  |                  |        |
| Quintax contact carrier 4-contacts (Please order contacts separately) |                                                                             |         |        |                  |                  |        |
| Pin contact carriers<br>4 contacts                                    | C146 10A004 901 15                                                          |         |        |                  |                  |        |
| Socket contact carriers<br>4 contacts                                 | C146 10B004 901 15                                                          |         |        |                  |                  |        |
| Potential balance spring<br>Pin module (2 Pieces)                     | for standard frames:<br>N 18 146 0011<br>for multi frames:<br>N 18 146 0021 |         |        |                  |                  |        |
| Potential balance spring<br>Socket module (2 Pieces)                  | for standard frames:<br>N 18 146 0012<br>for multi frames:<br>N 18 146 0022 |         |        |                  |                  |        |
| Supplied as                                                           | for wire gauge                                                              | AWG     | Pieces | Part number      |                  | Figure |
|                                                                       |                                                                             |         |        | Pin contact      | Socket contact   |        |
| Turned 1.6 mm crimp contacts                                          |                                                                             |         |        |                  |                  |        |
| Single contact                                                        | 0.14 – 0.37 mm <sup>2</sup>                                                 | 26 – 22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |        |
|                                                                       | 0.5 mm <sup>2</sup>                                                         | 20      | 100    | VN01 016 0025 2C | VN02 016 0025 2C |        |
|                                                                       | 0.75 – 1.0 mm <sup>2</sup>                                                  | 18      | 100    | VN01 016 0026 2C | VN02 016 0026 2C |        |
|                                                                       | 1.5 mm <sup>2</sup>                                                         | 16      | 100    | VN01 016 0027 2C | VN02 016 0027 2C |        |
|                                                                       | 2.5 mm <sup>2</sup>                                                         | 14      | 100    | VN01 016 0028 2C | VN02 016 0028 2C |        |
| Further tools see catalogue "Tools"                                   |                                                                             |         |        |                  |                  |        |

| General Characteristics                        | Standard      | Value                       |
|------------------------------------------------|---------------|-----------------------------|
| Number of contacts                             |               | 1 + shielding               |
| Termination technique                          |               | crimp                       |
| Wire gauge                                     |               | 0.14 - 4.5mm² (AWG 26 - 12) |
| Max. wire diameter                             |               | 3 - 9.5 mm                  |
| Flammability                                   | UL94          | V-0                         |
| Electrical Characteristics                     |               |                             |
| Rated voltage                                  | IEC 60664-1   | 50 V (UL/CSA 50 V)          |
| Rated impulse withstand voltage                | IEC 60664-1   | 0.8 kV                      |
| Screening effectiveness                        |               | see curves                  |
| Installation (overvoltage) category            | IEC 60664-1   | III                         |
| Material group                                 | IEC 60664-1   | III b                       |
| Contact resistance                             | IEC 60512-2-1 | ≤ 5 mΩ                      |
| Insulation resistance                          | IEC 60512-3-1 | ≥ 10 <sup>10</sup> Ω        |
| Pollution degree                               | IEC 60664-1   | 3                           |
| Climatical Characteristics                     |               |                             |
| Climatic category                              |               | 40 / 100 / 21               |
| Upper temperature                              |               | +100°C                      |
| Lower temperature                              |               | -40°C                       |
| Mechanical Characteristics                     |               |                             |
| IP-degree of protection pin contact carrier    | IEC 60529     | unmated IP00, mated IP20    |
| IP-degree of protection socket contact carrier | IEC 60529     | unmated IP20, mated IP20    |
| Weight pin contact carrier                     |               | 28 g                        |
| Weight socket contact carrier                  |               | 28 g                        |
| Weight pin module                              |               | 13 g                        |
| Weight socket module                           |               | 15 g                        |
| Mechanical operation                           | IEC 60512-9-1 | ≥ 500 mating cycles         |
| Material                                       |               |                             |
| Module                                         |               | PA                          |
| Colour module                                  |               | black                       |
| Contacts                                       |               | CuZn (brass)                |
| Contact plating                                |               | Au (gold)                   |
| Contact insert                                 |               | PC                          |
| Colour contact insert                          |               | grey                        |
| Shielding                                      |               | Cu alloy                    |
| Cable clamp                                    |               | Cu alloy                    |

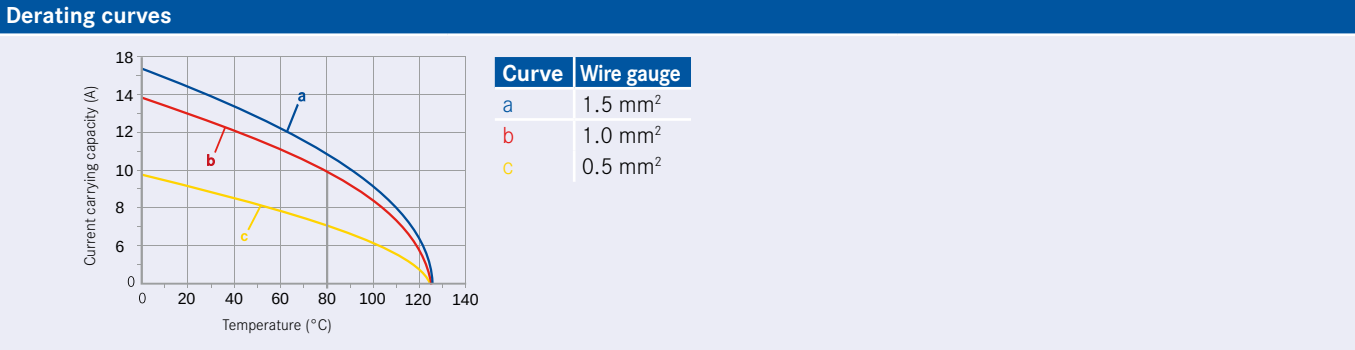


| Description                                                                      | Part number                              | Drawing | Figure |
|----------------------------------------------------------------------------------|------------------------------------------|---------|--------|
| <b>Adaptor modules</b>                                                           |                                          |         |        |
| Pin module                                                                       | C146 10A002 800 15                       |         |        |
| Socket module                                                                    | C146 10B002 800 15                       |         |        |
| <b>Coax - contact carrier (Please order contacts separately)</b>                 |                                          |         |        |
| Pin contact carrier<br>1 contact 50 Ω<br>Pin contact carrier<br>1 contact 75 Ω   | C146 10A001 902 15<br>C146 10A001 901 15 |         |        |
| Socket contact carrier<br>1 contact 50 Ω<br>Socket contact carrier<br>1-Pol 75 Ω | C146 10B001 902 15<br>C146 10B001 901 15 |         |        |

| Supplied as                                                                     | for wire gauge  | AWG     | Pieces | Part number      |                  | Figure |
|---------------------------------------------------------------------------------|-----------------|---------|--------|------------------|------------------|--------|
|                                                                                 |                 |         |        | Pin contact      | Socket contact   |        |
| <b>Turned 2.5 mm crimp contacts (for Coax - contact carrier 1 contact 50 Ω)</b> |                 |         |        |                  |                  |        |
| gold plating                                                                    | 0.14 - 0.37 mm² | 26 - 22 | 100    | VN01 025 0055 2C | VN02 025 0055 2C |        |
|                                                                                 | 0.5 mm²         | 20      | 100    | VN01 025 0035 2C | VN02 025 0035 2C |        |
|                                                                                 | 0.75 - 1.0 mm²  | 18      | 100    | VN01 025 0036 2C | VN02 025 0036 2C |        |
|                                                                                 | 1.5 mm²         | 16      | 100    | VN01 025 0037 2C | VN02 025 0037 2C |        |
|                                                                                 | 2.5 mm²         | 14      | 100    | VN01 025 0038 2C | VN02 025 0038 2C |        |
|                                                                                 | 3.0 mm²         | -       | 100    | VN01 025 0059 2C | VN02 025 0059 2C |        |
|                                                                                 | 4.0 mm²         | 12      | 100    | VN01 025 0039 2C | VN02 025 0039 2C |        |
| <b>Turned 2.5 mm crimp contacts (for Coax - contact carrier 1 contact 75 Ω)</b> |                 |         |        |                  |                  |        |
| gold plating                                                                    | 0.14 - 0.37 mm² | 26 - 22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |        |
|                                                                                 | 0.5 mm²         | 20      | 100    | VN01 016 0025 2C | VN02 016 0025 2C |        |
|                                                                                 | 0.75 - 1.0 mm²  | 18      | 100    | VN01 016 0026 2C | VN02 016 0026 2C |        |
|                                                                                 | 1.5 mm²         | 16      | 100    | VN01 016 0027 2C | VN02 016 0027 2C |        |
|                                                                                 | 2.5 mm²         | 14      | 100    | VN01 016 0028 2C | VN02 016 0028 2C |        |



| Brief information                                              |                 |                                              |
|----------------------------------------------------------------|-----------------|----------------------------------------------|
| High contact density, receptable- and cable side finger proof. |                 |                                              |
| General Characteristics                                        | Standard        | Value                                        |
| Number of contacts                                             |                 | 36 (18 x Pin, 18 x Socket)                   |
| Termination technique                                          |                 | crimp, PCB (in combination with PCB Adaptor) |
| Wire gauge                                                     |                 | 0.14 - 2.5mm <sup>2</sup> (AWG 26 - 14)      |
| Max. wire diameter                                             |                 | 3.7 mm                                       |
| Flammability                                                   | UL94            | V-0                                          |
| Electrical Characteristics                                     |                 |                                              |
| Rated voltage                                                  | IEC 60664-1     | 250 V (UL/CSA 250 V)                         |
| Rated impulse withstand voltage                                | IEC 60664-1     | 4 kV                                         |
| Rated Current T <sub>u</sub> = 40 °C                           |                 | 10 A                                         |
| Current carrying capacity                                      | IEC 60512-5-2   | see derating curves                          |
| Installation (overvoltage) category                            | IEC 60664-1     | III                                          |
| Material group                                                 | IEC 60664-1     | I                                            |
| Contact resistance                                             | IEC 60512-2-1   | ≤ 5 mΩ                                       |
| Insulation resistance                                          | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                         |
| Pollution degree                                               | IEC 60664-1     | 3                                            |
| Climatical Characteristics                                     |                 |                                              |
| Climatic category                                              | IEC 60068-1     | 40 / 125 / 10                                |
| Upper temperature                                              | IEC 60512-11-9  | +125°C                                       |
| Lower temperature                                              | IEC 60512-11-10 | -40°C                                        |
| Mechanical Characteristics                                     |                 |                                              |
| IP-degree of protection pin module                             | IEC 60529       | unmated IP20, mated IP20                     |
| IP-degree of protection socket module                          | IEC 60529       | unmated IP20, mated IP20                     |
| Weight pin module                                              |                 | 21 g                                         |
| Weight socket module                                           |                 | 21 g                                         |
| Mechanical operation                                           | IEC 60512-9-1   | ≥ 500 mating cycles                          |
| Material                                                       |                 |                                              |
| Insert / module                                                |                 | PA                                           |
| Colour insert / module                                         |                 | black                                        |
| Contacts                                                       |                 | CuZn (brass)                                 |
| Contact plating                                                |                 | Ag (silver) / Au (gold)                      |



| Description                                                  | Part number        | Drawing | Figure |
|--------------------------------------------------------------|--------------------|---------|--------|
| <b>36 contacts module (Please order contacts separately)</b> |                    |         |        |
| Pin module 36 contacts                                       | C146 10A036 600 15 |         |        |
| Socket module 36 contacts                                    | C146 10B036 600 15 |         |        |

| PCB Adaptor 6 contacts |                    |  |  |
|------------------------|--------------------|--|--|
| PCB Adaptor 6 contacts | C146 10B006 300 15 |  |  |
| PCB contact            | VN01 016 0057 3C   |  |  |
|                        | VN02 016 0057 3C   |  |  |

| Supplied as                          | for wire gauge              | AWG     | Pieces | Part number      |                  | Figure                                                                                |
|--------------------------------------|-----------------------------|---------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                      |                             |         |        | Pin contact      | Socket contact   |                                                                                       |
| Turned crimp contacts single contact |                             |         |        |                  |                  |                                                                                       |
| silver plating                       | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |  |
|                                      | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 016 0025 1C | VN02 016 0025 1C |                                                                                       |
|                                      | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16 | 100    | VN01 016 0026 1C | VN02 016 0026 1C |                                                                                       |
|                                      | 1.5 mm <sup>2</sup>         | 16 - 15 | 100    | VN01 016 0027 1C | VN02 016 0027 1C |                                                                                       |
|                                      | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 016 0028 1C | VN02 016 0028 1C |                                                                                       |
| gold plating                         | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                                      | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 016 0025 2C | VN02 016 0025 2C |                                                                                       |
|                                      | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16 | 100    | VN01 016 0026 2C | VN02 016 0026 2C |                                                                                       |
|                                      | 1.5 mm <sup>2</sup>         | 16 - 15 | 100    | VN01 016 0027 2C | VN02 016 0027 2C |                                                                                       |
|                                      | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 016 0028 2C | VN02 016 0028 2C |                                                                                       |

| Tools for turned contacts                                    |                            |                  |               |                    |
|--------------------------------------------------------------|----------------------------|------------------|---------------|--------------------|
| Description                                                  | for wire gauge             | Contact locator  | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.14 - 2.5 mm <sup>2</sup> | -                | -             | FG 0300 146 1      |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2.5 mm <sup>2</sup> | TA 0010 146 0001 | TA 0000 184   | TA 0000 or TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 2.5 mm <sup>2</sup> | -                | -             | TB 0400 146        |

Further tools see catalogue "Tools"

| Brief information                                                 |                               |                               |
|-------------------------------------------------------------------|-------------------------------|-------------------------------|
| CAT7 for Ethernet acc. ISO/IEC 11801, up to 10 GBit/s data rates. |                               |                               |
| General Characteristics                                           | Standard                      | Value                         |
| Number of contacts                                                |                               | 8 + shielding                 |
| Termination technique                                             |                               | crimp                         |
| Wire gauge                                                        |                               | 0.09 - 0.52 mm² (AWG 28 - 20) |
| Max. wire diameter                                                |                               | 1x5 - 12 mm                   |
| Flammability                                                      | UL94                          | V-0                           |
| Electrical Characteristics                                        |                               |                               |
| Rated voltage                                                     | IEC 60664-1                   | 50 V                          |
| Rated impulse withstand voltage                                   | IEC 60664-1                   | 0.8 kV                        |
| Rated Current T <sub>u</sub> = 40 °C                              |                               | 10 A                          |
| Installation (overvoltage) category                               | IEC 60664-1                   | III                           |
| Material group                                                    | IEC 60664-1                   | III b                         |
| Contact resistance                                                | IEC 60512-2-1                 | ≤ 5 mΩ                        |
| Insulation resistance                                             | IEC 60512-3-1                 | ≥ 10 <sup>10</sup> Ω          |
| Category of connection                                            | IEC 11801 ANSI/TIA/EIA-568-C2 | CAT7                          |
| Data rate                                                         |                               | max. 10 GBit/s                |
| Pollution degree                                                  | IEC 60664-1                   | 3                             |
| Climatical Characteristics                                        |                               |                               |
| Climatic category                                                 | IEC 60068-1                   | 40 / 85 / 21                  |
| Upper temperature                                                 | IEC 60512-11-9                | +85°C                         |
| Lower temperature                                                 | IEC 60512-11-10               | -40°C                         |
| Mechanical Characteristics                                        |                               |                               |
| IP-degree of protection pin contact carrier                       | IEC 60529                     | unmated IP00, mated IP20      |
| IP-degree of protection socket contact carrier                    | IEC 60529                     | unmated IP20, mated IP20      |
| Weight pin contact carrier                                        |                               | 34 g                          |
| Weight socket contact carrier                                     |                               | 36 g                          |
| Weight pin module                                                 |                               | 6 g                           |
| Weight socket module                                              |                               | 4 g                           |
| Mechanical operation                                              | IEC 60512-9-1                 | ≥ 500 mating cycles           |
| Material                                                          |                               |                               |
| Module                                                            |                               | PA                            |
| Colour module                                                     |                               | black                         |
| Contacts                                                          |                               | CuZn (brass)                  |
| Contact plating                                                   |                               | Au (gold)                     |
| Contact insert                                                    |                               | PC                            |
| Colour contact insert                                             |                               | grey                          |
| Shielding                                                         |                               | Cu alloy                      |
| Cable clamp (separate Part number)                                |                               | Cu alloy                      |

| Description                                                                                                 | Part Number                              | Drawing | Figure |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------|---------|--------|
| Adaptor modules                                                                                             |                                          |         |        |
| Pin module                                                                                                  | C146 10A001 800 15                       |         |        |
| Socket module                                                                                               | C146 10B001 800 15                       |         |        |
| GigaBit-contact carrier* (contacts & cable clamps please order separately)                                  |                                          |         |        |
| Pin contact carrier<br>- without shield connection to the frame<br>- with shield connection to the frame    | C146 10A008 901 15<br>C146 10A008 902 15 |         |        |
| Socket contact carrier<br>- without shield connection to the frame<br>- with shield connection to the frame | C146 10B008 901 15<br>C146 10B008 902 15 |         |        |

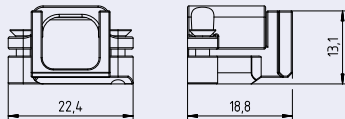
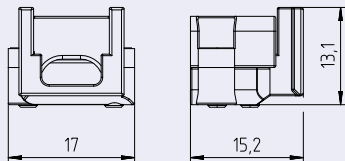
| Supplied as                  | for wire gauge  | AWG     | Pieces | Part number      |                  | Figure |
|------------------------------|-----------------|---------|--------|------------------|------------------|--------|
|                              |                 |         |        | Pin contact      | Socket contact   |        |
| Turned 1.0 mm crimp contacts |                 |         |        |                  |                  |        |
| gold plating                 | 0.09 - 0.25 mm² | 28 - 24 | 100    | VN01 010 0066 2C | VN02 010 0066 2C |        |
|                              | 0.13 - 0.33 mm² | 26 - 22 | 100    | VN01 010 0067 2C | VN02 010 0067 2C |        |
|                              | 0.25 - 0.52 mm² | 24 - 20 | 100    | VN01 010 0068 2C | VN02 010 0068 2C |        |

| Tools for turned contacts                  |                     |                 |               |             |
|--------------------------------------------|---------------------|-----------------|---------------|-------------|
| Description                                | for wire gauge      | Contact locator | Part number   |             |
|                                            |                     |                 | Crimping dies | Tool        |
| Removal tool for contacts                  | 0.09 mm² - 0.52 mm² | -               | -             | 17 D 438 SP |
| 4-Indent crimping tool for turned contacts | 0.09 mm² - 0.52 mm² | -               | -             | TB 0300 146 |
| Further tools see catalogue "Tools"        |                     |                 |               |             |



| Brief information                                                |                               |                              |
|------------------------------------------------------------------|-------------------------------|------------------------------|
| Cat5e for Ethernet acc. ISO/IEC 11801, up to 1 GBit/s data rate. |                               |                              |
| General Characteristics                                          | Standard                      | Value                        |
| Number of contacts                                               |                               | 8 + shielding                |
| Termination technique                                            |                               | crimp                        |
| Wire gauge                                                       |                               | 0.14 - 2.5 mm² (AWG 26 - 14) |
| Max. wire diameter                                               |                               | 2x5 - 12 mm                  |
| Flammability                                                     | UL94                          | V-0                          |
| Electrical Characteristics                                       |                               |                              |
| Rated voltage                                                    | IEC 60664-1                   | 50 V                         |
| Rated impulse withstand voltage                                  | IEC 60664-1                   | 0.8 kV                       |
| Rated Current T <sub>u</sub> = 40 °C                             |                               | 10 A                         |
| Installation (overvoltage) category                              | IEC 60664-1                   | III                          |
| Material group                                                   | IEC 60664-1                   | III b                        |
| Contact resistance                                               | IEC 60512-2-1                 | ≤ 5 mΩ                       |
| Insulation resistance                                            | IEC 60512-3-1                 | ≥ 10 <sup>10</sup> Ω         |
| Category of connection                                           | IEC 11801 ANSI/TIA/EIA-568-C2 | CAT5e                        |
| Data rate                                                        |                               | max 1 GBit/s                 |
| Pollution degree                                                 | IEC 60664-1                   | 3                            |
| Climatical Characteristics                                       |                               |                              |
| Climatic category                                                | IEC 60068-1                   | 40 / 85 / 21                 |
| Upper temperature                                                | IEC 60512-11-9                | +85°C                        |
| Lower temperature                                                | IEC 60512-11-10               | -40°C                        |
| Mechanical Characteristics                                       |                               |                              |
| IP-degree of protection pin contact carrier                      | IEC 60529                     | unmated IP00, mated IP20     |
| IP-degree of protection socket contact carrier                   | IEC 60529                     | unmated IP20, mated IP20     |
| Weight pin contact carrier                                       |                               | 41 g                         |
| Weight socket contact carrier                                    |                               | 44 g                         |
| Weight pin module                                                |                               | 6 g                          |
| Weight socket module                                             |                               | 4 g                          |
| Mechanical operation                                             | IEC 60512-9-1                 | ≥ 500 mating cycles          |
| Material                                                         |                               |                              |
| Module                                                           |                               | PA                           |
| Colour module                                                    |                               | black                        |
| Contacts                                                         |                               | CuZn (brass)                 |
| Contact plating                                                  |                               | Au (gold)                    |
| Contact insert                                                   |                               | PC                           |
| Colour contact insert                                            |                               | grey                         |
| Shielding                                                        |                               | Cu alloy                     |
| Cable clamp (separate part number)                               |                               | Cu alloy                     |

| Description                                                                                                 | Part number                              | Drawing          | Figure                                                                                |                  |                  |                                                                                       |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------|---------------------------------------------------------------------------------------|------------------|------------------|---------------------------------------------------------------------------------------|
| Adaptor modules*                                                                                            |                                          |                  |                                                                                       |                  |                  |                                                                                       |
| Pin module                                                                                                  | C146 10A001 800 15                       |                  |    |                  |                  |                                                                                       |
| Socket module                                                                                               | C146 10B001 800 15                       |                  |    |                  |                  |                                                                                       |
| MegaBit-contact carrier* (contacts & cable clamps please order separately)                                  |                                          |                  |                                                                                       |                  |                  |                                                                                       |
| Pin contact carrier<br>- without shield connection to the frame<br>- with shield connection to the frame    | C146 10A008 905 15<br>C146 10A008 906 15 |                  |   |                  |                  |                                                                                       |
| Socket contact carrier<br>- without shield connection to the frame<br>- with shield connection to the frame | C146 10B008 905 15<br>C146 10B008 906 15 |                  |  |                  |                  |                                                                                       |
| Supplied as                                                                                                 | for wire gauge                           | AWG              | Pieces                                                                                | Part number      |                  | Figure                                                                                |
|                                                                                                             |                                          |                  |                                                                                       | Pin contact      | Socket contact   |                                                                                       |
| Turned 1.6 mm crimp contacts                                                                                |                                          |                  |                                                                                       |                  |                  |                                                                                       |
| gold plating                                                                                                | 0.14 – 0.37 mm <sup>2</sup>              | 26-22            | 100                                                                                   | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                                                                                                             | 0.5 mm <sup>2</sup>                      | 20               | 100                                                                                   | VN01 016 0025 2C | VN02 016 0025 2C |                                                                                       |
|                                                                                                             | 0.75 – 1.0 mm <sup>2</sup>               | 20-16            | 100                                                                                   | VN01 016 0026 2C | VN02 016 0026 2C |                                                                                       |
|                                                                                                             | 1.5 mm <sup>2</sup>                      | 16-15            | 100                                                                                   | VN01 016 0027 2C | VN02 016 0027 2C |                                                                                       |
|                                                                                                             | 2.5 mm <sup>2</sup>                      | 14               | 100                                                                                   | VN01 016 0028 2C | VN02 016 0028 2C |                                                                                       |
| Tools                                                                                                       |                                          |                  |                                                                                       |                  |                  |                                                                                       |
| Description                                                                                                 | for wire gauge                           | Contact locator  |                                                                                       | Part number      |                  | Tool                                                                                  |
| Removal tool for contacts                                                                                   | 0.14 – 2.5 mm <sup>2</sup>               | -                |                                                                                       | -                |                  | FG 0300 146 1                                                                         |
| Standard crimping tool and accessories for 4-Indent crimping                                                | 0.14 – 2.5 mm <sup>2</sup>               | TA 0010 146 0001 |                                                                                       | TA 0000 184      |                  | TA 0000 or TA 0500                                                                    |
| 4-Indent crimping tool                                                                                      | 0.14 – 2.5 mm <sup>2</sup>               | -                |                                                                                       | -                |                  | TB 0400 146                                                                           |
| Further tools see catalogue "Tools"                                                                         |                                          |                  |                                                                                       |                  |                  |                                                                                       |

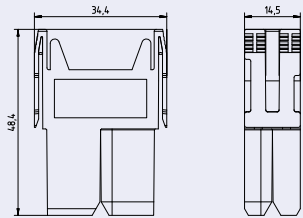
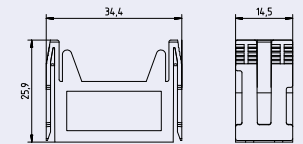
| Description                                                             | Part number                                     | Drawing                                                                            | Figure                                                                              |
|-------------------------------------------------------------------------|-------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Cable clamps for GigaBit contact carrier                                |                                                 |                                                                                    |                                                                                     |
| Cable clamp 5 - 7 mm<br>Cable clamp 7 - 10 mm<br>Cable clamp 10 - 12 mm | N 16 146 0011<br>N 16 146 0012<br>N 16 146 0013 |  |  |
| Cable clamps for MegaBit contact carrier                                |                                                 |                                                                                    |                                                                                     |
| Cable clamp 5 - 7 mm<br>Cable clamp 7 - 10 mm<br>Cable clamp 10 - 12 mm | N 16 146 0021<br>N 16 146 0022<br>N 16 146 0023 |  |  |



| General Characteristics               | Standard        | Value                            |                                |
|---------------------------------------|-----------------|----------------------------------|--------------------------------|
| Number of contacts                    |                 | 9                                | 15                             |
| Termination technique                 |                 | crimp                            |                                |
| Wire gauge                            |                 | 0.09 - 0.52 mm²<br>(AWG 28 - 20) | 0.09 - 0.25 mm²<br>(AWG 28-24) |
| Clamping range                        |                 | 2x 3.8 - 6.8mm                   |                                |
| Max. wire diameter                    |                 | 2.3 mm                           | 1.6 mm                         |
| Flammability                          | UL94            | V-0                              |                                |
| Electrical Characteristics            |                 |                                  |                                |
| Rated voltage                         | IEC 60664-1     | 500 V                            |                                |
| Rated impulse withstand voltage       | IEC 60664-1     | 0.8 kV                           |                                |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 5 A                              |                                |
| Current carrying capacity             |                 |                                  |                                |
| Installation (overvoltage) category   | IEC 60664-1     | III                              |                                |
| Material group                        | IEC 60664-1     | I                                |                                |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                           |                                |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω             |                                |
| Pollution degree                      | IEC 60664-1     | 3                                |                                |
| Climatical Characteristics            |                 |                                  |                                |
| Climatic category                     | IEC 60068-1     | 40 / 85 / 10                     |                                |
| Upper temperature                     | IEC 60512-11-9  | +85°C                            |                                |
| Lower temperature                     | IEC 60512-11-10 | -40°C                            |                                |
| Mechanical Characteristics            |                 |                                  |                                |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20         |                                |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20         |                                |
| Weight pin module 9 contacts          |                 | 35 g                             |                                |
| Weight socket module 9 contacts       |                 | 34 g                             |                                |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles              |                                |
| Material                              |                 |                                  |                                |
| Module                                |                 | PA                               |                                |
| Colour module                         |                 | black                            |                                |
| Contacts                              |                 | CuZn (brass)                     |                                |
| Contact plating                       |                 | Au (gold)                        |                                |
| Material                              |                 | PC                               |                                |
| Shielding                             |                 | Cu alloy                         |                                |
| Cable clamp                           |                 | Stainless steel                  |                                |
| Derating curves                       |                 |                                  |                                |

| Description                                                           | Part Number                 | Drawing         | Figure            |                   |        |
|-----------------------------------------------------------------------|-----------------------------|-----------------|-------------------|-------------------|--------|
| D-Sub module                                                          |                             |                 |                   |                   |        |
| Adaptor module<br>(Please order contact inserts separately)           | C146 10H001 800 15          |                 |                   |                   |        |
| Pin module 9 contacts<br>(Please order contact inserts separately)    | C146 10A009 600 15          |                 |                   |                   |        |
| Socket module 9 contacts<br>(Please order contact inserts separately) | C146 10B009 600 15          |                 |                   |                   |        |
| Contact inserts D-Sub 15 contacts* (Please order contacts separately) |                             |                 |                   |                   |        |
| Pin insert                                                            | C146 10A015 901 15          |                 |                   |                   |        |
| Socket insert                                                         | C146 10B015 901 15          |                 |                   |                   |        |
| Supplied as                                                           | for wire gauge              | AWG             | Part Number       |                   | Figure |
|                                                                       |                             |                 | Pin contact       | Socket contact    |        |
| Punched crimp contacts, gold plating                                  |                             |                 |                   |                   |        |
| 1.0 mm<br>crimp contacts for<br>D-Sub 9 contacts                      | 0.09 - 0.25 mm <sup>2</sup> | 28 - 24         | VN01 010 0166 2 C | VN02 010 0166 2 C |        |
|                                                                       | 0.25 - 0.5 mm <sup>2</sup>  | 24 - 20         | VN01 010 0168 2 C | VN02 010 0168 2 C |        |
| 0.8 mm<br>crimp contacts for<br>D-Sub 15 contacts                     | 0.09 - 0.25 mm <sup>2</sup> | 28 - 24         | VN01 008 0066 2 C | VN02 008 0066 2 C |        |
| Tools for turned contacts                                             |                             |                 |                   |                   |        |
| Description                                                           | for wire gauge              | Part number     |                   |                   |        |
|                                                                       |                             | Contact locator | Crimping dies     | Tools             |        |
| Removal tool for contacts                                             | 0.09 - 0.5 mm <sup>2</sup>  | -               | -                 | 17 D 438 SP       |        |
| Crimping tools                                                        | 0.09 - 0.5 mm <sup>2</sup>  | -               | -                 | TA 0200 146       |        |

| Brief information                                                                                                                                                                                                                                          |                 |                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|
| Modules with centering function allow the use of the modular system in rack and panel applications without housing. The modules align a floating frame so that modules can be plugged central. For optimal function two modules must be used in the frame. |                 |                    |
| Climatical Characteristics                                                                                                                                                                                                                                 |                 |                    |
| Climatic category                                                                                                                                                                                                                                          | IEC 60068-1     | 40 / 125 / 21      |
| Upper temperature                                                                                                                                                                                                                                          | IEC 60512-11-9  | +125°C             |
| Lower temperature                                                                                                                                                                                                                                          | IEC 60512-11-10 | -40°C              |
| Mechanical Characteristics                                                                                                                                                                                                                                 |                 |                    |
| Weight blind module with centering function                                                                                                                                                                                                                |                 | 9 g                |
| Weight blind module standard                                                                                                                                                                                                                               |                 | 6 g                |
| Mechanical operation                                                                                                                                                                                                                                       | IEC 60512-9-1   | ≥500 mating cycles |
| Materials                                                                                                                                                                                                                                                  |                 |                    |
| Contact module                                                                                                                                                                                                                                             |                 | PA                 |
| Colour contact module                                                                                                                                                                                                                                      |                 | black              |

| Description                          | Part Number        | Drawing                                                                             | Figure                                                                              |
|--------------------------------------|--------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Blind module                         |                    |                                                                                     |                                                                                     |
| Blind module with centering function | C146 10H000 600 15 |  |  |
| Blind module standard                | C146 10H000 601 15 |  |  |





# heavy | mate® HSE

- Rated voltage 400 V
- Rated current 42 A
- Termination: screw
- Number of contacts: 6

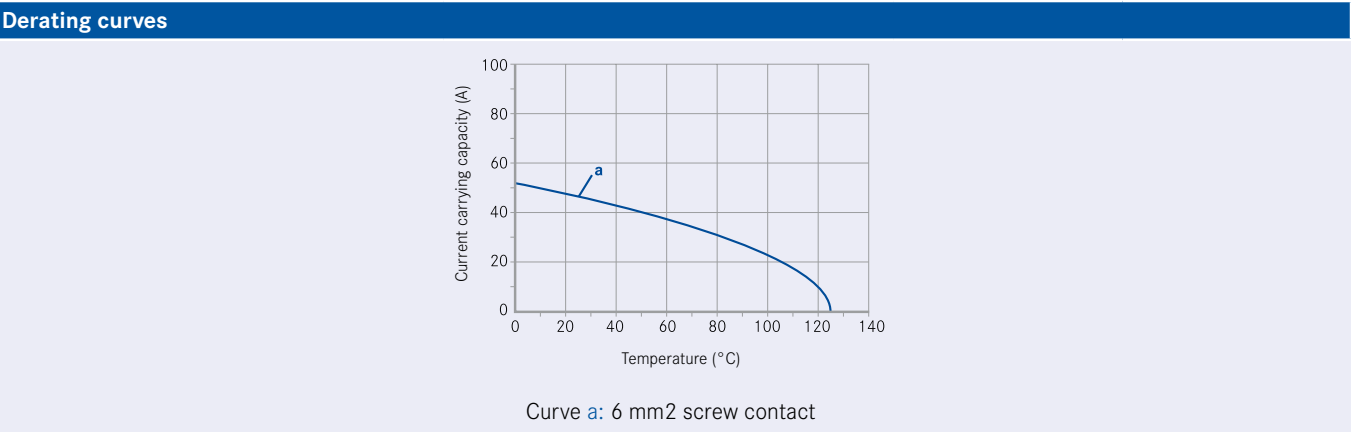
## heavy | mate® HSE Brief information



HSE

| Approvals, Testhouse |                                                                                       | Characteristics | Approval-Number |
|----------------------|---------------------------------------------------------------------------------------|-----------------|-----------------|
| UL                   |  | 600 V           | E 63093         |
| CSA                  |  | 600 V           | 48932           |

| General Characteristics                             | Standard        | Value                                   |
|-----------------------------------------------------|-----------------|-----------------------------------------|
| Number of contacts                                  |                 | 6 + ⊕                                   |
| Termination technique                               |                 | screw                                   |
| Wire gauge                                          |                 | 0.5 - 6.0 mm <sup>2</sup> (AWG 20 - 10) |
| Max. wire diameter                                  |                 | 6.4 mm                                  |
| Flammability                                        | UL 94           | V-0                                     |
| Electrical Characteristics                          |                 |                                         |
| Rated voltage                                       | IEC 60664-1     | 400 V (UL/CSA 600 V)                    |
| Rated impulse withstand voltage                     | IEC 60664-1     | 6 kV                                    |
| Rated current T <sub>amp</sub> = 40 °C              |                 | 42 A                                    |
| Rated current                                       | IEC 60512-5-2   | see Derating curves                     |
| Installation (overvoltage) category                 | IEC 60664-1     | III                                     |
| Material group                                      | IEC 60664-1     | II                                      |
| Contact resistance                                  | IEC 60512-2-1   | ≤ 1 m Ω                                 |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                    |
| Pollution degree                                    | IEC 60664-1     | 3                                       |
| Climatical Characteristics                          |                 |                                         |
| Climatic category                                   | IEC 60068-1     | 40 / 125 / 21                           |
| Upper temperature                                   | IEC 60512-11-9  | + 125 °C                                |
| Lower temperature                                   | IEC 60512-11-10 | - 40 °C                                 |
| Mechanical Characteristics                          |                 |                                         |
| IP-degree of protection pin insert <sup>1)</sup>    | IEC 60529       | unmated IP00, mated IP20                |
| IP-degree of protection socket insert <sup>1)</sup> | IEC 60529       | unmated IP20, mated IP20                |
| Weight pin insert                                   |                 | 80 g                                    |
| Weight socket insert                                |                 | 80 g                                    |
| Mechanical operation                                | IEC 60512-9-1   | ≥ 500 mating cycles                     |
| Materials                                           |                 |                                         |
| Contact insert                                      |                 | PA                                      |
| Colour contact insert                               |                 | black                                   |
| Contacts                                            |                 | CuZn (brass)                            |
| Contact plating                                     |                 | Ag (silver)                             |



| Description                                                    | Part Number       | Drawing                    | Figure |
|----------------------------------------------------------------|-------------------|----------------------------|--------|
| <b>Contact insert 6 + ⊕</b>                                    |                   |                            |        |
| Pin insert<br>with wire protection<br>for screw termination    | C146 10A006 102 5 |                            |        |
| Socket insert<br>with wire protection<br>for screw termination | C146 10B006 102 5 |                            |        |
| Pin layout                                                     |                   | Assembly instruction       |        |
| Pin insert<br>                                                 | Socket insert<br> | Panel cut out (insert)<br> |        |

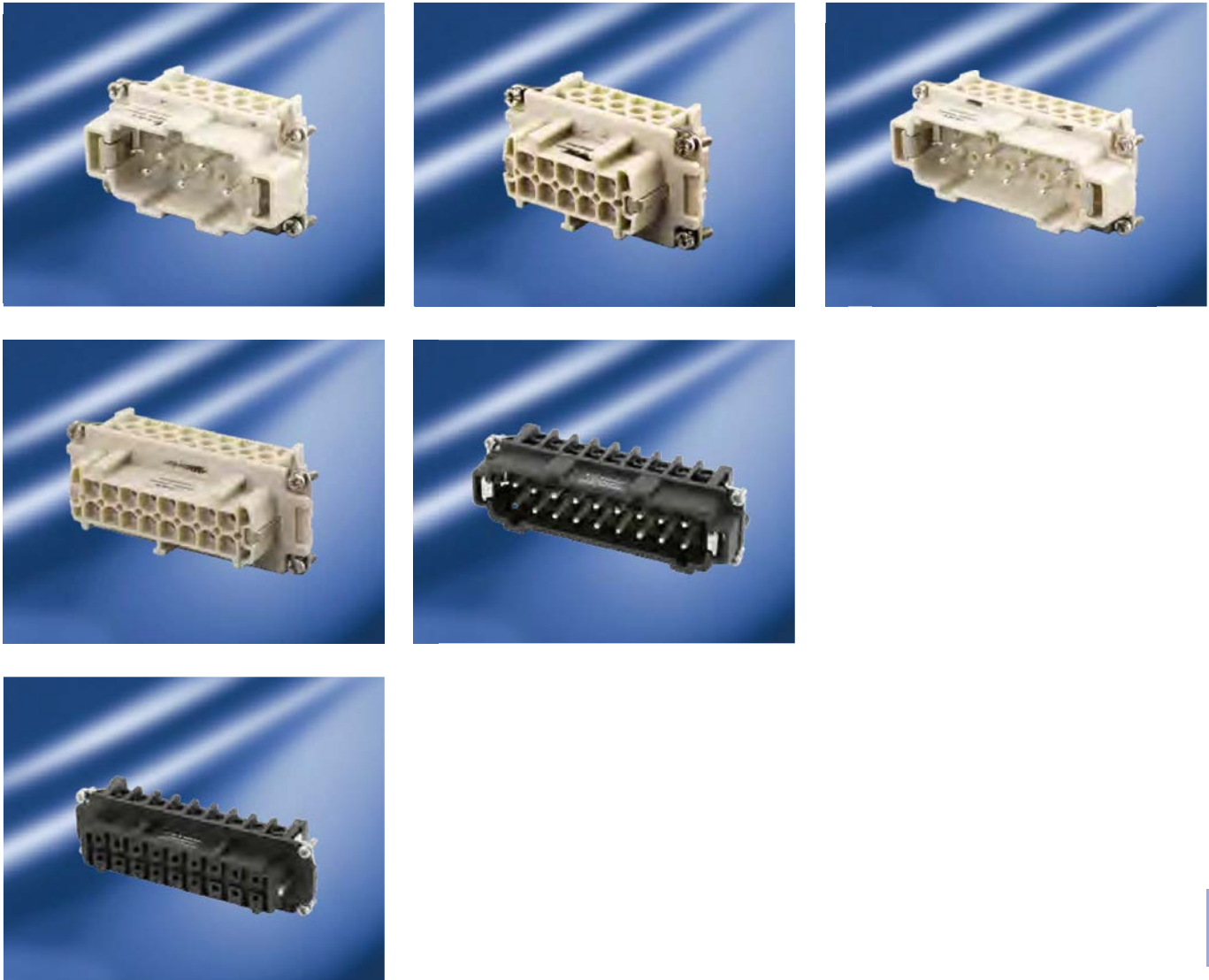




# heavy | mate<sup>®</sup> HvE

- Rated voltage 660 V
- Rated current 16 A
- Termination: screw
- 2 delayed mating contacts
- Number of contacts: 3, 6, 10, 16, 32
- HL3 acc. EN 45545: R22/23 (3 - 10 contacts)

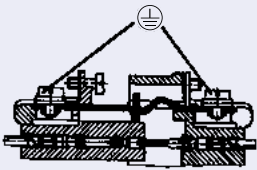
## heavy | mate<sup>®</sup> HvE Brief information



HvE

| Approvals, Testhouse                                                                      | Characteristics               | Approval-Number |
|-------------------------------------------------------------------------------------------|-------------------------------|-----------------|
| UL   | see technical characteristics | E 63093         |
| CSA  | see technical characteristics | E 63093         |

| Construction of connectors Type HvE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connectors of heavy mate® HvE series only connect with counter parts of heavy mate HvE series.<br>The connectors of series heavy mate® HvE are based on series heavy mate® E with the following deviations:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Inserts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <div><div>The HVE-inserts with 3, 6 and 10 contacts are basically the same as the 10, 16 and 24-contacts inserts of series heavy mate® E. However they are only partly loaded with contacts and have two delayed mating pilot duty contacts.<br/>Only type 16 HVE has special inserts with a different contact arrangement. The mounting dimensions are however identical with the 24 contacts version of heavy mate® E.<br/>The delayed mating contacts are intended for switching a relay coil for electrically locking in order to have unloaded socket contacts in an unmated condition.</div><div>heavy mate® E inserts with pin contacts are not intermatable with heavy mate® HvE inserts with socket contacts due to<br/>a) two empty contact holes are closed at 3, 6 and 10 contact inserts.<br/>b) the 16 contacts HVE insert has a different contact arrangement.</div></div> |
| If connectors without breaking capacity are used as connectors with breaking capacity the electrical power data must be reduced in accordance with the manufacturer's specification. These specifications are available from the manufacturer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Housings: (made of aluminium)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| heavy mate® E housings with an inside insulation (plastic foil) are used for the 16-contacts insert.<br>The inside barriers at the narrow sides preventing mounting of 660 V-inserts in 400 V housings are removed and the 16-contacts insert is now mountable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| No standard for this series, but:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Intermateable and exchangeable with other makes<br>a) Contact insert to contact insert<br>b) Contact insert to housing 6, 10 ,16, 24 pin<br><br>Housings are designed according to DIN EN 175 301-801                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| First-to-mate last-to-break protective ground contact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |



| General Characteristics                             | Standard        | Value                    |      |                      |       |
|-----------------------------------------------------|-----------------|--------------------------|------|----------------------|-------|
| Number of contacts                                  |                 | 3                        | 6    | 10                   | 16    |
| Termination technique                               |                 | screw                    |      |                      |       |
| Wire gauge                                          |                 | 0.5 - 2.5 mm²            |      |                      |       |
| Max. wire diameter                                  |                 | 4.6 mm                   |      |                      |       |
| Flammability                                        | UL 94           | V-0                      |      |                      |       |
| Electrical Characteristics                          |                 |                          |      |                      |       |
| Rated voltage                                       | IEC 60664-1     | 660 V                    |      | 660 V (UL/CSA 600 V) |       |
| Rated impulse withstand voltage                     | IEC 60664-1     | 6 kV                     |      |                      |       |
| Rated Current T <sub>u</sub> = 40 °C                |                 | 16 A                     |      |                      |       |
| Current carrying capacity                           | IEC 60512-5-2   | see derating curves      |      |                      |       |
| Installation (overvoltage) category                 | IEC 60664-1     | III                      |      |                      |       |
| Material group                                      | IEC 60664-1     | III b                    |      | II                   |       |
| Contact resistance                                  | IEC 60512-2-1   | ≤ 5 m Ω                  |      |                      |       |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω     |      |                      |       |
| Pollution degree                                    | IEC 60664-1     | 3                        |      |                      |       |
| Climatical Characteristics                          |                 |                          |      |                      |       |
| Climatic category                                   | IEC 60068-1     | 40/125/21                |      |                      |       |
| Upper temperature                                   | IEC 60512-11-9  | + 125°C                  |      |                      |       |
| Lower temperature                                   | IEC 60512-11-10 | - 40°C                   |      |                      |       |
| Mechanical Characteristics                          |                 |                          |      |                      |       |
| IP-degree of protection pin insert <sup>1)</sup>    | IEC 60529       | unmated IP00, mated IP20 |      |                      |       |
| IP-degree of protection socket insert <sup>1)</sup> | IEC 60529       | unmated IP20, mated IP20 |      |                      |       |
| Weight pin insert                                   |                 | 49 g                     | 63 g | 81 g                 | 107 g |
| Weight socket insert                                |                 | 49 g                     | 63 g | 81 g                 | 107 g |
| Mechanical operation                                | IEC 60512-9-1   | ≥ 500 mating cycles      |      |                      |       |
| Materials                                           |                 |                          |      |                      |       |
| Insert                                              |                 | PC                       |      | PA                   |       |
| Colour insert                                       |                 | grey                     |      | black                |       |
| Contacts                                            |                 | CuZn (brass)             |      |                      |       |
| Contact plating                                     |                 | Ag (silver)              |      |                      |       |

HvE



| Description                                                    | Part Number       | Drawing | Figure |
|----------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 3 + ⊕ + 2 (delayed mating contacts)</b>      |                   |         |        |
| Pin insert<br>with wire protection<br>for screw termination    | C146 10A003 102 3 |         |        |
| Socket insert<br>with wire protection<br>for screw termination | C146 10B003 102 3 |         |        |

Pin layout

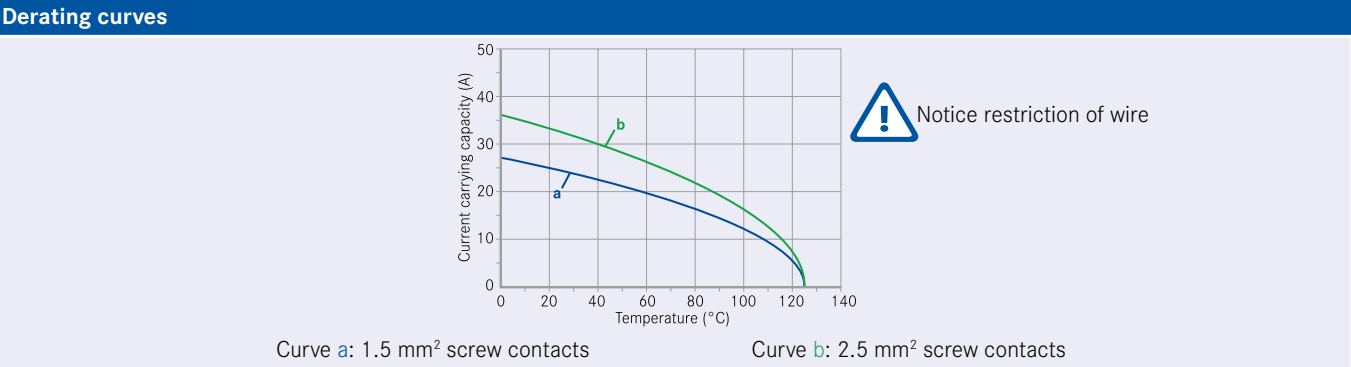
Assembly instruction

Pin insert

Socket insert

Panel cut out (insert)

- Working contact
- Mating contact
- Without contact



| Description                                                    | Part Number       | Drawing | Figure |
|----------------------------------------------------------------|-------------------|---------|--------|
| <b>Contact insert 6 + ⊕ + 2 (delayed mating contacts)</b>      |                   |         |        |
| Pin insert<br>with wire protection<br>for screw termination    | C146 10A006 102 3 |         |        |
| Socket insert<br>with wire protection<br>for screw termination | C146 10B006 102 3 |         |        |

Pin layout

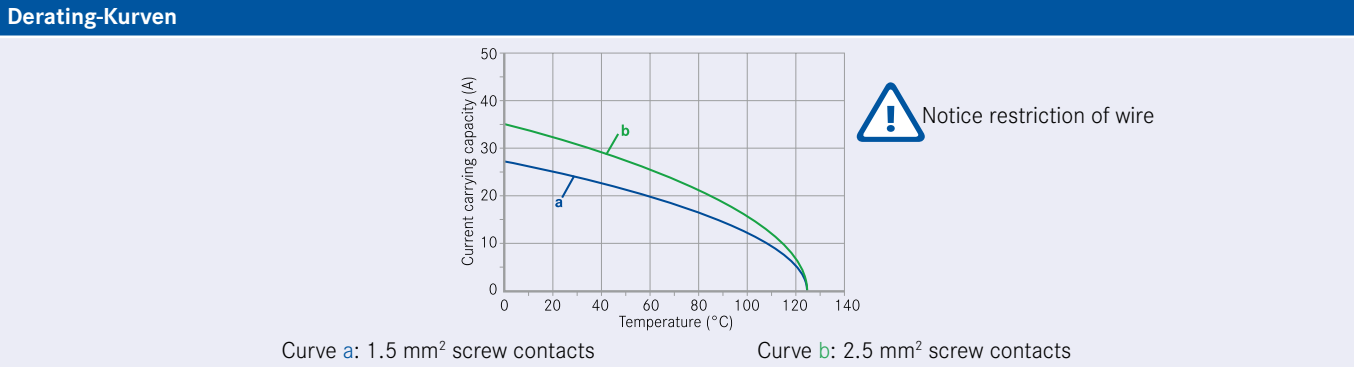
Assembly instruction

Pin insert

Socket insert

Panel cut out (insert)

- Working contact
- Mating contact
- Without contact



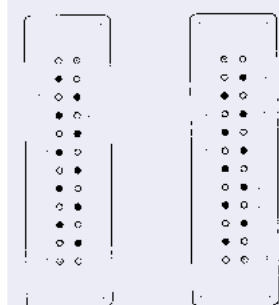
| Description                                                                  | Part Number       | Drawing                                                                                                                                                                                                           | Figure                                                                                                   |
|------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| <b>Contact insert 10 + <math>\oplus</math> + 2 (delayed mating contacts)</b> |                   |                                                                                                                                                                                                                   |                                                                                                          |
| Pin insert<br>with wire protection<br>for screw termination                  | C146 10A010 102 3 | <p>Technical drawing of the pin insert showing side and front views. Dimensions include: overall length 110.4, contact pitch 10.4, contact width 3.4, contact height 2.7, and mounting hole diameter 3.12.</p>    | <p>Photograph of the pin insert component, showing its yellow plastic housing and metal contacts.</p>    |
| Socket insert<br>with wire protection<br>for screw termination               | C146 10B010 102 3 | <p>Technical drawing of the socket insert showing side and front views. Dimensions include: overall length 110.5, contact pitch 10.4, contact width 3.4, contact height 2.7, and mounting hole diameter 3.12.</p> | <p>Photograph of the socket insert component, showing its yellow plastic housing and metal contacts.</p> |

## Pin layout

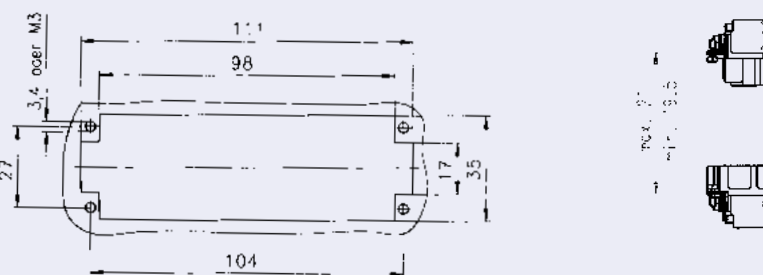
## Assembly instruction

| Pin insert | Socket insert |
|------------|---------------|
|------------|---------------|

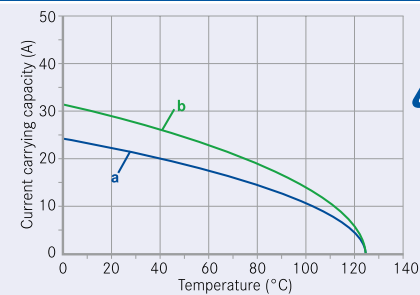
Panel cut out (insert)



- Working contact
- Mating contact
- Without contact



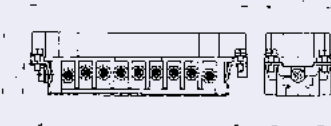
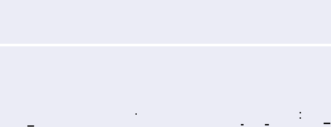
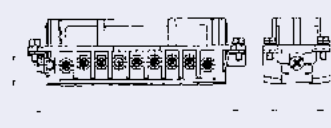
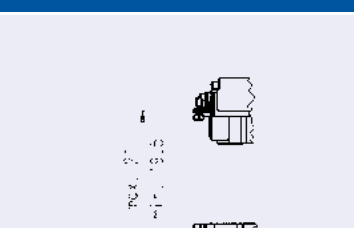
## Derating curves



 Notice restriction of wire

Curve a: 1.5 mm<sup>2</sup> screw contacts

Curve **b**: 2.5 mm<sup>2</sup> screw contacts

| Description                                                       | Part Number       | Drawing                                                                             | Figure                                                                              |
|-------------------------------------------------------------------|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Contact insert 16 + ♂ + 2 (delayed mating contacts)</b>        |                   |                                                                                     |                                                                                     |
| Pin insert<br>with wire protection<br>for screw termination       | C146 10A016 102 3 |  |  |
| Pin insert<br>without wire protection<br>for screw termination    | C146 10A016 002 3 |  |  |
| Socket insert<br>with wire protection<br>for screw termination    | C146 10B016 102 3 |  |  |
| Socket insert<br>without wire protection<br>for screw termination | C146 10B016 002 3 |  |  |

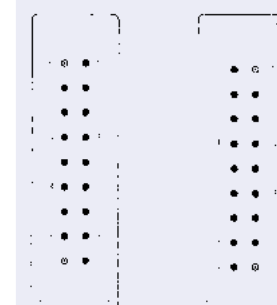
## Pin layout

## Assembly instruction

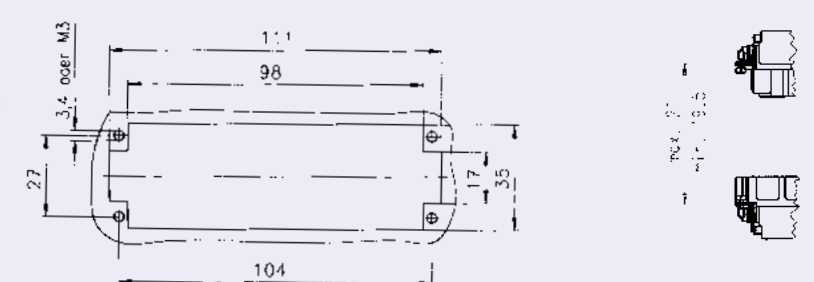
Pin insert

Socket insert

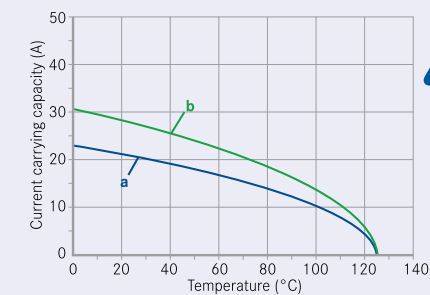
Panel cut out (insert)



- Working contact
- Mating contact



## Derating curves



 Notice restriction of wire

Curve a: 1.5 mm<sup>2</sup> screw contacts

Curve **b**: 2.5 mm<sup>2</sup> screw contacts





# heavy|mate® K

- Power + signal as mixed arrangement
- Rated voltage up to 830 V
- Termination: screw, crimp
- HL3 acc. EN 45545: R22/23

## heavy|mate® K Brief information

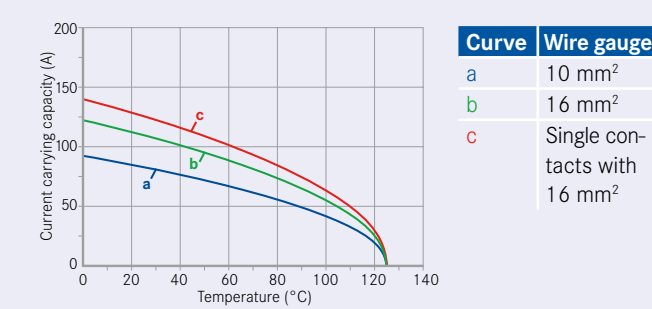


| Approvals, Testhouse                                                                         | Characteristics               | Approval-Number |
|----------------------------------------------------------------------------------------------|-------------------------------|-----------------|
| UL<br>  | see technical characteristics | E 63093         |
| CSA<br> | see technical characteristics | E 63093         |



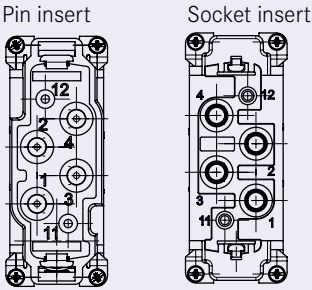
| General Characteristics                             | Standard        | Value                                    |                                                                                                       |
|-----------------------------------------------------|-----------------|------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Number of contacts                                  |                 | 4+0+ ⊕<br>(4 Power)                      | 4+2+ ⊕<br>(4 Power + 2 Signal)                                                                        |
| Termination technique                               |                 | screw                                    |                                                                                                       |
| Wire gauge                                          |                 | 1.5 - 16 mm <sup>2</sup><br>(AWG 16 - 6) | Power: 1.5 - 16 mm <sup>2</sup><br>(AWG 16 - 6)<br>Signal: 0.5 - 2.5 mm <sup>2</sup><br>(AWG 20 - 14) |
| Max. wire diameter                                  |                 | 11 mm                                    | Power: 11 mm,<br>Signal: 4.8 mm                                                                       |
| Flammability                                        | UL94            | V-0                                      |                                                                                                       |
| Electrical Characteristics                          |                 |                                          |                                                                                                       |
| Rated voltage                                       | IEC 60664-1     | 830 V<br>(UL/CSA 600 V)                  | Power: 830 V (UL/CSA 600 V)<br>Signal: 400 V (UL/CSA 300 V)                                           |
| Rated impulse withstand voltage                     | IEC 60664-1     | 8 kV                                     | Power: 8 kV<br>Signal: 6 kV                                                                           |
| Rated Current T <sub>u</sub> = 40 °C                |                 | 80 A                                     | Power: 80 A<br>Signal: 16 A                                                                           |
| Current carrying capacity                           | IEC 60512-5-2   | see derating curves                      |                                                                                                       |
| Installation (overvoltage) category                 | IEC 60664-1     | III                                      |                                                                                                       |
| Material group                                      | IEC 60664-1     | III b                                    |                                                                                                       |
| Contact resistance                                  | IEC 60512-2-1   | ≤ 5 mΩ                                   |                                                                                                       |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                     |                                                                                                       |
| Pollution degree                                    | IEC 60664-1     | 3                                        |                                                                                                       |
| Climatical Characteristics                          |                 |                                          |                                                                                                       |
| Climatic category                                   | IEC 60068-1     | 40 / 125 / 21                            |                                                                                                       |
| Upper temperature                                   | IEC 60512-11-9  | +125°C                                   |                                                                                                       |
| Lower temperature                                   | IEC 60512-11-10 | -40°C                                    |                                                                                                       |
| Mechanical Characteristics                          |                 |                                          |                                                                                                       |
| IP-degree of protection pin insert <sup>1)</sup>    | IEC 60529       | unmated IP00, mated IP20                 |                                                                                                       |
| IP-degree of protection socket insert <sup>1)</sup> | IEC 60529       | unmated IP20, mated IP20                 |                                                                                                       |
| Weight pin insert                                   |                 | 109 g                                    | 114 g                                                                                                 |
| Weight socket insert                                |                 | 108 g                                    | 113 g                                                                                                 |
| Mechanical operation                                | IEC 60512-9-1   | ≥ 500 mating cycles                      |                                                                                                       |
| Materials                                           |                 |                                          |                                                                                                       |
| Insert                                              |                 | PC                                       |                                                                                                       |
| Colour insert                                       |                 | grey                                     |                                                                                                       |
| Contacts                                            |                 | CuZn (brass)                             |                                                                                                       |
| Contact plating                                     |                 | Ag (silver)                              |                                                                                                       |

Derating Kurven



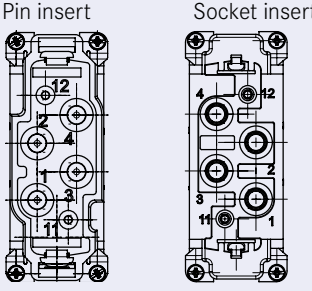
| Description          | Part Number        | Drawing | Figure |
|----------------------|--------------------|---------|--------|
| Contact insert 4 + ⊕ |                    |         |        |
| Pin insert 4 + ⊕     | C146 10A004 100 13 |         |        |
| Socket insert 4 + ⊕  | C146 10B004 100 13 |         |        |

Pin layout



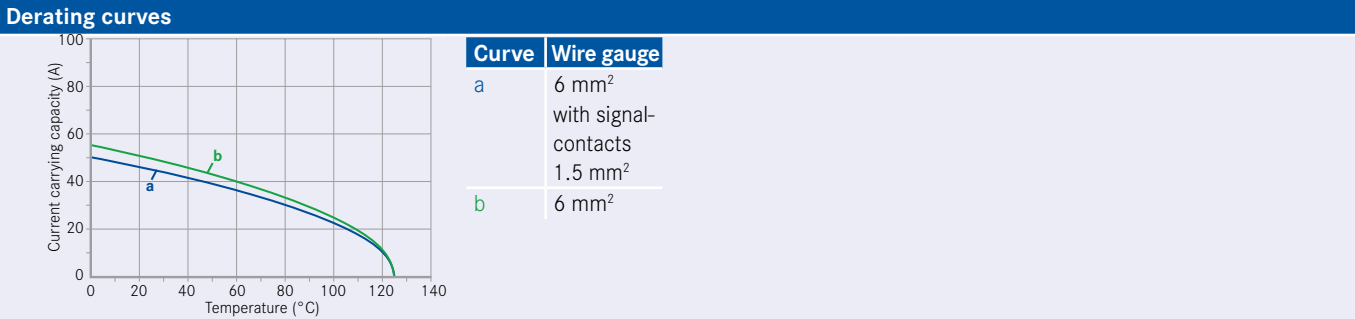
| Description           | Part Number        | Drawing | Figure |
|-----------------------|--------------------|---------|--------|
| Contact insert 4+2+ ⊕ |                    |         |        |
| Pin insert 4+2+ ⊕     | C146 10A006 100 13 |         |        |
| Socket insert 4+2+ ⊕  | C146 10B006 100 13 |         |        |

Pin layout





| General Characteristics               | Standard        | Value                                                                             |
|---------------------------------------|-----------------|-----------------------------------------------------------------------------------|
| Number of contacts                    |                 | 6 + 36 + ☉ (6 Power + 36 Signal)                                                  |
| Termination technique                 |                 | crimp                                                                             |
| Wire gauge                            |                 | 1.5 – 6.0mm <sup>2</sup> (AWG 16 – 10)<br>0.14 – 2.5mm <sup>2</sup> (AWG 26 – 14) |
| Max. wire diameter                    |                 | Power: 5.2 mm, Signal: 3.7 mm                                                     |
| Flammability                          | UL94            | V-0                                                                               |
| Electrical Characteristics            |                 |                                                                                   |
| Rated voltage                         | IEC 60664-1     | Power: 690 V, Signal: 160 V<br>(UL/CSA 600 V, 300 V)                              |
| Rated impulse withstand voltage       | IEC 60664-1     | Power: 8.0 kV, Signal: 2.5 kV                                                     |
| Rated Current T <sub>u</sub> = 40 °C  |                 | Power: 40 A, Signal: 10 A                                                         |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                                                               |
| Installation (overvoltage) category   | IEC 60664-1     | III                                                                               |
| Material group                        | IEC 60664-1     | III b                                                                             |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                                                            |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                                              |
| Pollution degree                      | IEC 60664-1     | 3                                                                                 |
| Climatical Characteristics            |                 |                                                                                   |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                                                                     |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                                                            |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                                                             |
| Mechanical Characteristics            |                 |                                                                                   |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP00, mated IP20                                                          |
| IP-degree of protection socket insert | IEC 60529       | unmated IP20, mated IP20                                                          |
| Weight pin insert                     |                 | 65 g                                                                              |
| Weight socket insert                  |                 | 74 g                                                                              |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                                                               |
| Material                              |                 |                                                                                   |
| Insert                                |                 | PC                                                                                |
| Colour insert                         |                 | grey                                                                              |
| Contacts                              |                 | CuZn (brass)                                                                      |
| Contact plating                       |                 | Ag (silver) / Au (gold)                                                           |



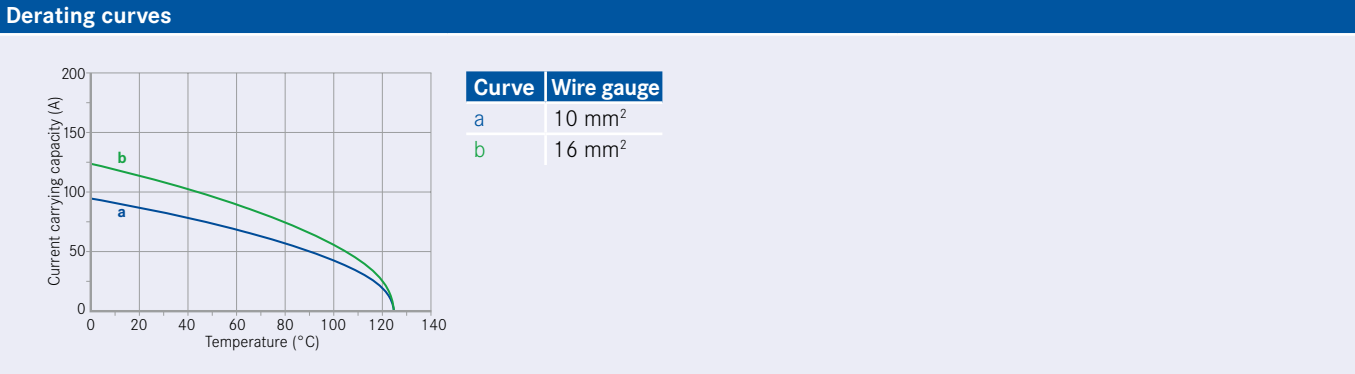
| Description                                                         | Part Number        | Drawing | Figure |
|---------------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 6 + 36 + ☉ (Please order contacts separately)</b> |                    |         |        |
| Pin insert 6 + 36 + ☉                                               | C146 10A042 500 13 |         |        |
| Socket insert 6 + 36 + ☉                                            | C146 10B042 500 13 |         |        |

| Pin layout |               |
|------------|---------------|
| Pin insert | Socket insert |
|            |               |

| Supplied as                  | for wire gauge  | AWG   | Pieces | Part Number      |                  | Figure                                                                                |
|------------------------------|-----------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                              |                 |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 4 mm crimp contacts   |                 |       |        |                  |                  |                                                                                       |
| silver plating               | 1.5 mm²         | 16    | 100    | VN01 040 0010 1C | VN02 040 0010 1C |  |
|                              | 2.5 mm²         | 14    | 100    | VN01 040 0011 1C | VN02 040 0011 1C |                                                                                       |
|                              | 4 mm²           | 12    | 100    | VN01 040 0012 1C | VN02 040 0012 1C |                                                                                       |
|                              | 6 mm²           | 10    | 100    | VN01 040 0013 1C | VN02 040 0013 1C |                                                                                       |
| Turned 1.6 mm crimp contacts |                 |       |        |                  |                  |                                                                                       |
| silver plating               | 0.14 - 0.37 mm² | 26-22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |  |
|                              | 0.5 mm²         | 20    | 100    | VN01 016 0025 1C | VN02 016 0025 1C |                                                                                       |
|                              | 0.75 - 1.0 mm²  | 20-16 | 100    | VN01 016 0026 1C | VN02 016 0026 1C |                                                                                       |
|                              | 1.5 mm²         | 16-15 | 100    | VN01 016 0027 1C | VN02 016 0027 1C |                                                                                       |
|                              | 2.5 mm²         | 14    | 100    | VN01 016 0028 1C | VN02 016 0028 1C |                                                                                       |

| Tools for 4 mm <sup>2</sup> turned contacts                  |                            |                   |                 |                    |
|--------------------------------------------------------------|----------------------------|-------------------|-----------------|--------------------|
| Description                                                  | for wire gauge             | Contact locator   | Calibration pin | Tool               |
| Removal tool for contacts                                    | 1.5 – 6 mm <sup>2</sup>    | -                 | -               | FG 0300 146 5000   |
| 4-indent crimping tool                                       | 1.5 – 6 mm <sup>2</sup>    | -                 | -               | TB 0700 146        |
| Tools for turned contacts                                    |                            |                   |                 |                    |
| Description                                                  | for wire gauge             | Contact locator   | Crimping dies   | Tool               |
| Removal tool for contacts                                    | 0.14 – 2.5 mm <sup>2</sup> | -                 | -               | FG 0300 146 1      |
| Standard crimping tool and accessories for 4-indent crimping | 0.14 – 2.5 mm <sup>2</sup> | TA 0010 146 000 1 | TA 0000 184     | TA 0000 or TA 0500 |
| 4-indent crimping tool                                       | 0.14 – 2.5 mm <sup>2</sup> | -                 | -               | TB 0400 146        |
| Further tools see catalogue “Tools”                          |                            |                   |                 |                    |

| General Characteristics                             | Standard        | Value                                                                   |
|-----------------------------------------------------|-----------------|-------------------------------------------------------------------------|
| Number of contacts                                  |                 | 4+8 + ☺ (4 Power + 8 Signal)                                            |
| Termination technique                               |                 | screw                                                                   |
| Wire gauge                                          |                 | Power: 1.5 - 16 mm² (AWG 16 - 6)<br>Signal: 0.5 - 2.5 mm² (AWG 20 - 14) |
| Max. wire diameter                                  |                 | Power: 11 mm, Signal: 4.8 mm                                            |
| Flammability                                        | UL94            | V-0                                                                     |
| Electrical Characteristics                          |                 |                                                                         |
| Rated voltage                                       | IEC 60664-1     | Power: 400 V, Signal: 400 V<br>(UL/CSA 600 V, 660 V)                    |
| Rated impulse withstand voltage                     | IEC 60664-1     | 8 kV                                                                    |
| Rated Current T <sub>u</sub> = 40 °C                |                 | Power: 80 A, Signal: 16 A                                               |
| Current carrying capacity                           | IEC 60512-5-2   | see derating curves                                                     |
| Installation (overvoltage) category                 | IEC 60664-1     | III                                                                     |
| Material group                                      | IEC 60664-1     | III b                                                                   |
| Contact resistance                                  | IEC 60512-2-1   | ≤ 5 mΩ                                                                  |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                                    |
| Pollution degree                                    | IEC 60664-1     | 3                                                                       |
| Climatical Characteristics                          |                 |                                                                         |
| Climatic category                                   | IEC 60068-1     | 40 / 125 / 21                                                           |
| Upper temperature                                   | IEC 60512-11-9  | +125°C                                                                  |
| Lower temperature                                   | IEC 60512-11-10 | -40°C                                                                   |
| Mechanical Characteristics                          |                 |                                                                         |
| IP-degree of protection pin insert <sup>1)</sup>    | IEC 60529       | unmated IP00, mated IP20                                                |
| IP-degree of protection socket insert <sup>1)</sup> | IEC 60529       | unmated IP20, mated IP20                                                |
| Weight pin insert                                   |                 | 147 g                                                                   |
| Weight socket insert                                |                 | 148 g                                                                   |
| Mechanical operation                                | IEC 60512-9-1   | ≥ 500 mating cycles                                                     |
| Material                                            |                 |                                                                         |
| Insert                                              |                 | PC                                                                      |
| Colour insert                                       |                 | grey                                                                    |
| Contacts                                            |                 | CuZn (brass)                                                            |
| Contact plating                                     |                 | Ag (silver)                                                             |

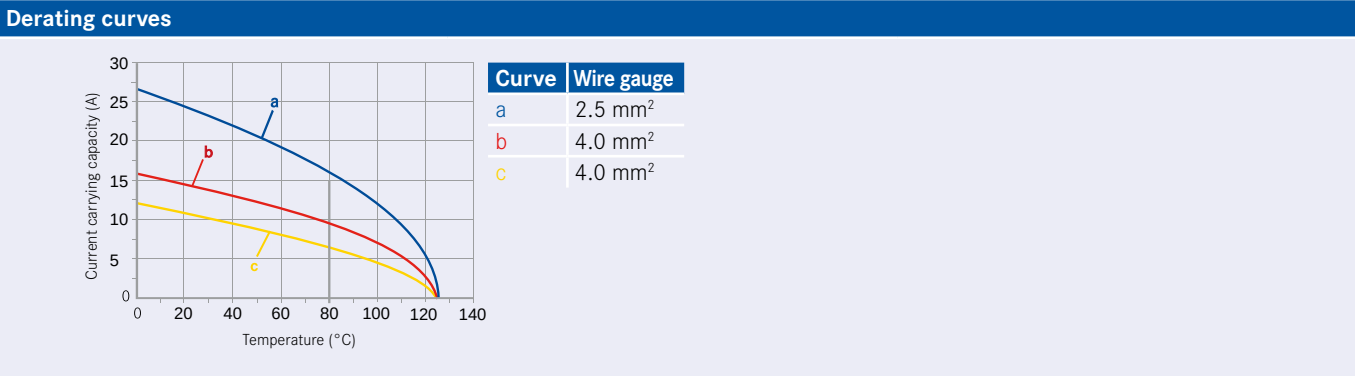


| Description                   | Part Number        | Drawing | Figure |
|-------------------------------|--------------------|---------|--------|
| <b>Contact insert 4+8 + ☺</b> |                    |         |        |
| Pin insert 4+8+ ☺             | C146 10A012 100 13 |         |        |
| Socket insert 4+8+ ☺          | C146 10B012 100 13 |         |        |
| <b>Pin layout</b>             |                    |         |        |
| Pin insert                    | Socket insert      |         |        |

K



| General Characteristics                             | Standard        | Value                                                                       |
|-----------------------------------------------------|-----------------|-----------------------------------------------------------------------------|
| Number of contacts                                  |                 | 8+24+ ⓘ (8 Power + 24 Signal)                                               |
| Termination technique                               |                 | crimp                                                                       |
| Wire gauge                                          |                 | Power: 0.5 - 4 mm² (AWG 20 - 12)<br>Signal: 0.14 - 2.5 mm² (AWG 26 - 14)    |
| Max. wire diameter                                  |                 | Power: 4.6 mm, Signal 3.7 mm                                                |
| Flammability                                        | UL94            | V-0                                                                         |
| Electrical Characteristics                          |                 |                                                                             |
| Rated voltage                                       | IEC 60664-1     | Power: 230 V (conductor-earth),<br>400 V (conductor-earth)<br>Signal: 160 V |
| Rated impulse withstand voltage                     | IEC 60664-1     | Power: 4 kV, Signal: 2,5 kV                                                 |
| Rated Current T <sub>u</sub> = 40 °C                |                 | Power: 16 A, Signal: 10 A                                                   |
| Current carrying capacity                           | IEC 60512-5-2   | see derating curves                                                         |
| Installation (overvoltage) category                 | IEC 60664-1     | III                                                                         |
| Material group                                      | IEC 60664-1     | III b                                                                       |
| Contact resistance                                  | IEC 60512-2-1   | ≤ 5 mΩ                                                                      |
| Insulation resistance                               | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                                        |
| Pollution degree                                    | IEC 60664-1     | 3                                                                           |
| Climatical Characteristics                          |                 |                                                                             |
| Climatic category                                   | IEC 60068-1     | 40 / 125 / 21                                                               |
| Upper temperature                                   | IEC 60512-11-9  | +125°C                                                                      |
| Lower temperature                                   | IEC 60512-11-10 | -40°C                                                                       |
| Mechanical Characteristics                          |                 |                                                                             |
| IP-degree of protection pin insert <sup>1)</sup>    | IEC 60529       | unmated IP00, mated IP20<br>unmated IP20, mated IP20                        |
| IP-degree of protection socket insert <sup>1)</sup> | IEC 60529       | IP20                                                                        |
| Weight pin insert                                   |                 | 51 g                                                                        |
| Weight socket insert                                |                 | 57 g                                                                        |
| Mechanical operation                                | IEC 60512-9-1   | ≥ 500 mating cycles                                                         |
| Material                                            |                 |                                                                             |
| Insert                                              |                 | PC                                                                          |
| Colour insert                                       |                 | grey                                                                        |
| Contacts                                            |                 | CuZn (brass)                                                                |
| Contact plating                                     |                 | Ag (silver) / Au (gold)                                                     |



| Description                                                       | Part Number        | Drawing | Figure |
|-------------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 8+24+ ⓘ (Please order contacts separately)*</b> |                    |         |        |
| Pin insert 8+24+ ⓘ                                                | C146 10A032 500 13 |         |        |
| Socket insert 8+24+ ⓘ                                             | C146 10B032 500 13 |         |        |

| Supplied as                  | for wire gauge  | AWG   | Pieces | Part number      |                  | Figure                                                                                |
|------------------------------|-----------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                              |                 |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 4 mm crimp contacts   |                 |       |        |                  |                  |                                                                                       |
| silver plating               | 1.5 mm²         | 16    | 100    | VN01 040 0010 1C | VN02 040 0010 1C |   |
|                              | 2.5 mm²         | 14    | 100    | VN01 040 0011 1C | VN02 040 0011 1C |                                                                                       |
|                              | 4 mm²           | 12    | 100    | VN01 040 0012 1C | VN02 040 0012 1C |                                                                                       |
|                              | 6 mm²           | 10    | 100    | VN01 040 0013 1C | VN02 040 0013 1C |                                                                                       |
| Turned 1,6 mm crimp contacts |                 |       |        |                  |                  |                                                                                       |
| silver plating               | 0.14 - 0.37 mm² | 26-22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |  |
|                              | 0.5 mm²         | 20    | 100    | VN01 016 0025 1C | VN02 016 0025 1C |                                                                                       |
|                              | 0.75 - 1.0 mm²  | 20-16 | 100    | VN01 016 0026 1C | VN02 016 0026 1C |                                                                                       |
|                              | 1.5 mm²         | 16-15 | 100    | VN01 016 0027 1C | VN02 016 0027 1C |                                                                                       |
|                              | 2.5 mm²         | 14    | 100    | VN01 016 0028 1C | VN02 016 0028 1C |                                                                                       |

| Tools for 4 mm turned contacts |                |                 |          |                  |
|--------------------------------|----------------|-----------------|----------|------------------|
| Description                    | for wire gauge | Contact locator | Test pin | Tool             |
| Removal tool for contacts      | 1.5 - 6 mm²    | -               | -        | FG 0300 146 5000 |
| 4-Indent crimping tool         | 1.5 - 6 mm²    | -               | -        | TB 0700 146      |

| Tools for 1.6 mm turned contacts                             |                |                  |               |                    |
|--------------------------------------------------------------|----------------|------------------|---------------|--------------------|
| Description                                                  | for wire gauge | Contact locator  | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.14 - 2.5 mm² | -                | -             | FG 0300 146 1      |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2.5 mm² | TA 0010 146 0001 | TA 0000 184   | TA 0000 or TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 2.5 mm² | -                | -             | TB 0400 146        |
| Further tools see catalogue "Tools"                          |                |                  |               |                    |





# heavy|mate® M

- Modular connector
- More module slots than heavy|mate® F and market standard
- Rated voltage 63 - 1000 V
- Rated current 5 A ... 220 A
- Termination: crimp

## heavy|mate® M Brief information



| Approvals, Testhouse                                                                         | Characteristics               | Approval-Number |
|----------------------------------------------------------------------------------------------|-------------------------------|-----------------|
| VDE<br> | See technical characteristics | 56 79 ÜG        |
| UL<br>  | See technical characteristics | E 63093         |
| CSA<br> | See technical characteristics | 48932           |



General information

- Modules inserts without crimp contacts, crimping tools see separate catalogue “Tools”.
  - Contacts must be ordered separately, processing instructions see catalogue “Tools”.
  - Connectors series heavy|mate® M may be engaged or disengaged when live but without electrical load. If these connectors are mated or unmated under load, the load shall be reduced to 10 % of rated current.
- We recommend using the high profile housings / hoods for the heavy|mate® M inserts.
  - Empty modul spaces have to be filled with blind modules.
  - Torque for PE connection 1.8 Nm

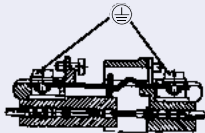


Advantages of the system

- High combination possibilities
  - Possibility of inverse configuration
- Rated voltage up to 1000 V
  - Low cost

First-to-mate last-to-break protective ground contact

Minimum wire size 0.5 mm²



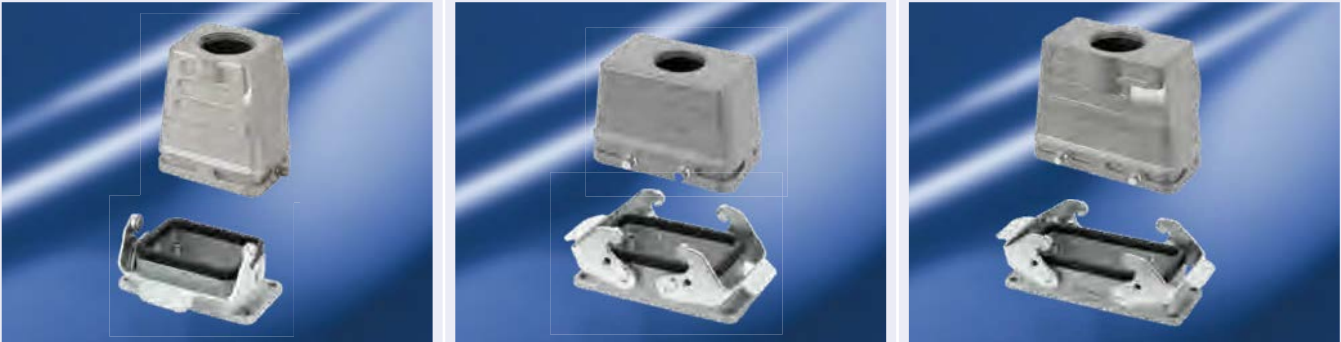
Modules



Frames



Range of housings



Requirements

- 3 x 400V; 50A; 6mm² wire gauge
- 8 x 250V; 8A; 1.5mm² wire gauge
- 5 x 400V; 15A; 4mm² wire gauge

Solution

1. Check how 16 contacts can be realized; see modules overview on page 158

- Possible selection:
- a) 1 x 20 contacts
  - b) 2 x 10 contacts
  - c) 1 x 10 contacts+ 2 x 5 contacts
  - d) 1 x 3 contacts + 1 x 5 contacts + 1 x 10 contacts

2. Check technical parameters / solution, see detail pages of the modules on page 166

- Possible selection:
- a) not possible due to voltage
  - b) not possible due to voltage
  - c) not possible due to current
  - d) POSSIBLE

3. Choose matching contact, see detail page of the modules on page 166

- Possible selection:
- a) 3 contacts = C146 A03 001 E8 → contacts = VN01 036 0002 1C
  - b) 5 contacts = C146 A05 001 E8 → contacts = VN01 025 0033 1C
  - c) 10 contacts = C146 A10 001 E8 → contacts = VN01 016 0027 1C

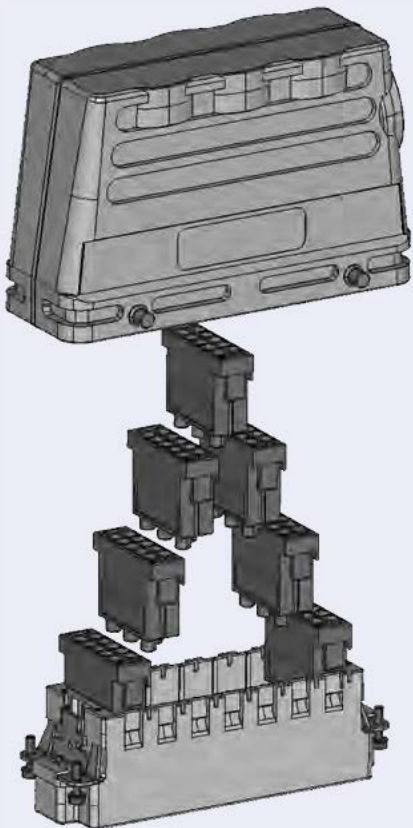
4. Choose matching frame, see frames on page 166

Solution: C146 P10 001 G8

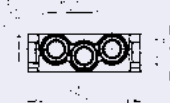
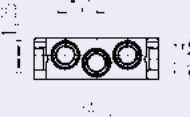
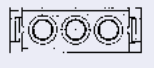
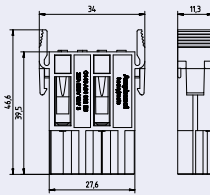
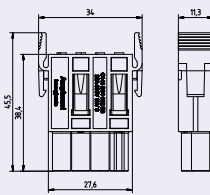
5. Choose matching housing, see housings from page 228

Solution: C146 21R010 600 8

Schematic construction



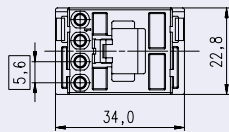
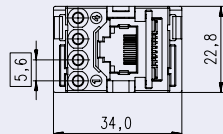
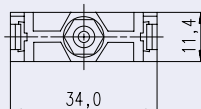
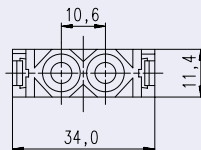
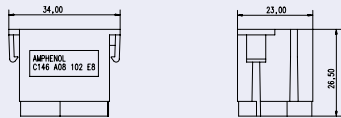
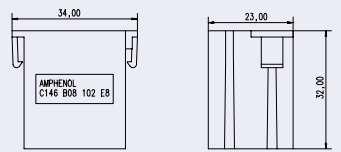
| Description                                            | Part Number     | Drawing | Figure |
|--------------------------------------------------------|-----------------|---------|--------|
| <b>1 contact module, 1000 V, Details see page 166</b>  |                 |         |        |
| Pin module 1 contact                                   | C146 A01 001 E8 |         |        |
| Socket module 1 contact                                | C146 B01 004 E8 |         |        |
| <b>2 contacts module, 1000 V, Details see page 168</b> |                 |         |        |
| Pin module 2 contacts                                  | C146 A02 001 E8 |         |        |
| Socket module 2 contacts                               | C146 B02 001 E8 |         |        |
| <b>2 contacts module, 1000 V, Details see page 170</b> |                 |         |        |
| Pin module 2 contacts                                  | C146 A02 801 E8 |         |        |
| Socket module 2 contacts                               | C146 B02 801 E8 |         |        |

| Description                                            | Part Number     | Drawing                                                                               | Figure                                                                                |
|--------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>3 contacts module, 1000 V, Details see page 172</b> |                 |                                                                                       |                                                                                       |
| Pin module 3 contacts                                  | C146 A03 801 E8 |    |    |
| Socket module 3 contacts                               | C146 B03 801 E8 |    |    |
| <b>3 contacts module, 690 V, Details see page 174</b>  |                 |                                                                                       |                                                                                       |
| Pin module 3 contacts                                  | C146 A03 001 E8 |    |   |
| Socket module 3 contacts                               | C146 B03 001 E8 |  |  |
| <b>4 contacts module, 630 V, Details see page 176</b>  |                 |                                                                                       |                                                                                       |
| Pin module 4 contacts                                  | C146 A04 002 E8 |  |  |
| Socket module 4 contacts                               | C146 B04 002 E8 |  |  |

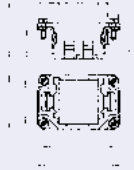
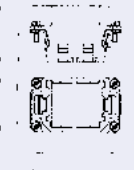
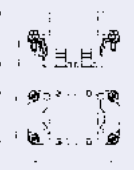
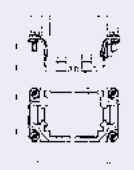


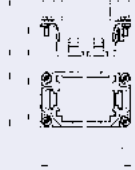
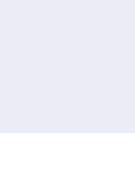
| Description                                                          | Part number                                                                   | Drawing | Figure |
|----------------------------------------------------------------------|-------------------------------------------------------------------------------|---------|--------|
| 5 contacts module für stanced contacts, 1000 V, Details see page 178 |                                                                               |         |        |
| Pin module 5 contacts                                                | C146 D04 001 E8 (4-Pol)<br>C146 D05 001 E8 (4 + ⊕)<br>C146 D05 801 E8 (5-Pol) |         |        |
| Socket module 5 contacts                                             | C146 C04 001 E8 (4-Pol)<br>C146 C05 001 E8 (4 + ⊕)<br>C146 C05 801 E8 (5-Pol) |         |        |
| 5 contacts module for turned contacts, 400 V, Details see page 180   |                                                                               |         |        |
| Pin module 5 contacts                                                | C146 A05 001 E8                                                               |         |        |
| Socket module 5 contacts                                             | C146 B05 001 E8                                                               |         |        |
| 10 contacts module for stanced contacts, 400 V, Details see page 182 |                                                                               |         |        |
| Pin module 10 contacts                                               | C146 D10 001 E8                                                               |         |        |
| Socket module 10 contacts                                            | C146 C10 001 G8                                                               |         |        |

| Description                                                          | Part number     | Drawing | Figure |
|----------------------------------------------------------------------|-----------------|---------|--------|
| 10 contacts module fpr stanced contacts, 400 V, Details see page 184 |                 |         |        |
| Pin module 10 contacts                                               | C146 A10 001 E8 |         |        |
| Socket module 10 contacts                                            | C146 B10 001 E8 |         |        |
| 20 contacts module, 63 V, Details see page 186                       |                 |         |        |
| Pin module 20 contacts                                               | C146 A20 001 G8 |         |        |
| Socket module 20 contacts                                            | C146 B20 001 G8 |         |        |
| 3 contacts module for Coax-contacts, Details see page 188            |                 |         |        |
| Pin module 3 contacts                                                | C146 A03 501 E8 |         |        |
| Socket module 3 contacts                                             | C146 B03 501 E8 |         |        |

| Description                                                       | Part Number                                                                                                  | Drawing                                                                              | Figure                                                                                |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>RJ45 module, Details see page 191</b>                          |                                                                                                              |                                                                                      |                                                                                       |
| Pin module RJ45                                                   | C146 E12 001 E8                                                                                              |     |    |
| Socket module RJ45                                                | C146 F12 001 G8                                                                                              |     |    |
| <b>Pneumatic module, 1 or 2 connections, Details see page 193</b> |                                                                                                              |                                                                                      |                                                                                       |
| Pin module                                                        | C146 G01 014 G8 (2.5 mm)<br>C146 G01 024 G8 (4.0 mm)<br>C146 G02 014 G8 (2.5 mm)<br>C146 G02 024 G8 (4.0 mm) |     |   |
| Socket module                                                     | C146 H01 034 G8 (2.5 mm)<br>C146 H01 044 G8 (4.0 mm)<br>C146 H02 034 G8 (2.5 mm)<br>C146 H02 044 G8 (4.0 mm) |   |  |
| <b>Shielded Quintax - module, details see on page195</b>          |                                                                                                              |                                                                                      |                                                                                       |
| Pin module                                                        | C146 A08 102 E8<br>C146 A05 100 G8                                                                           |  |  |
| Socket Module                                                     | C146 B08 102 E8<br>C146 B05 100 G8                                                                           |  |  |

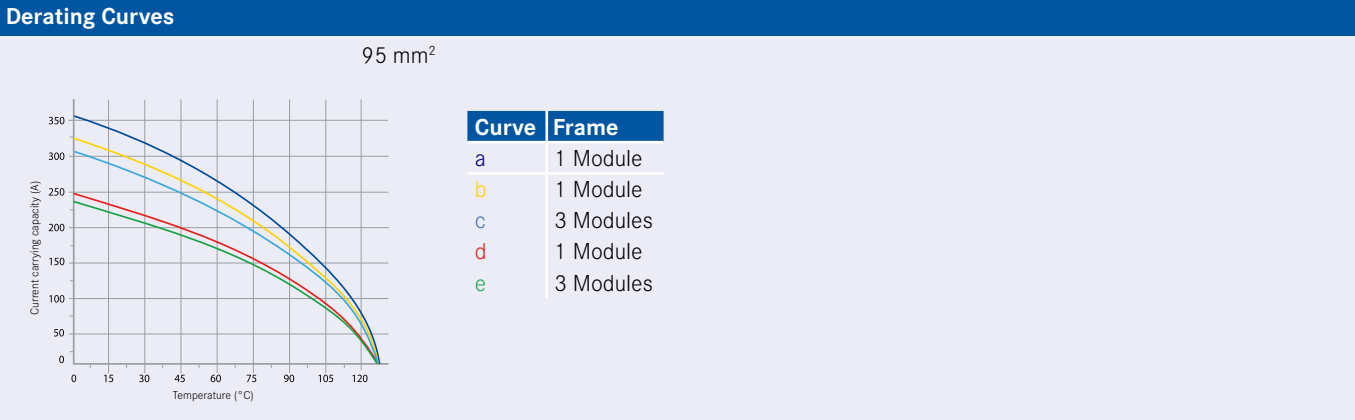


| Description                                             | Part Number                                 | Drawing                                                                             | Figure                                                                                |
|---------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Frame for 2 modules   Size E6   Housings from page 226  |                                             |                                                                                     |                                                                                       |
| Frame for 2 pin modules                                 | C146 P06 001 G8<br>C146 P06 002 G8 (2 x PE) |    |    |
| Frame for 2 socket modules                              | C146 S06 001 G8<br>C146 S06 002 G8 (2 x PE) |    |    |
| Frame for 3 modules   Size E10   Housings from page 228 |                                             |                                                                                     |                                                                                       |
| Frame for 3 pin modules                                 | C146 P10 001 G8<br>C146 P10 002 G8 (2 x PE) |    |   |
| Frame for 3 socket modules                              | C146 S10 001 G8<br>C146 S10 002 G8 (2 x PE) |  |  |
| Frame for 5 modules   Size E16   Housings from page 235 |                                             |                                                                                     |                                                                                       |
| Frame for 5 pin modules                                 | C146 P16 001 G8<br>C146 P16 002 G8 (2 x PE) |  |  |
| Frame for 5 socket modules                              | C146 S16 001 G8<br>C146 S16 002 G8 (2 x PE) |  |  |

| Description                                             | Part Number                                 | Drawing                                                                               | Figure                                                                               |
|---------------------------------------------------------|---------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Frame for 7 modules   Size E24   Housings from page 241 |                                             |                                                                                       |                                                                                      |
| Frame for 7 pin modules<br>Positions A-G                | C146 P24 001 G8<br>C146 P24 002 G8 (2 x PE) |    |   |
| Frame for 7 pin modules<br>Positions T-Z                | C146 P24 101 G8<br>C146 P24 102 G8 (2 x PE) |    |   |
| Frame for 7 socket modules<br>Positions A-G             | C146 S24 001 G8<br>C146 S24 002 G8 (2 x PE) |    |   |
| Frame for 7 socket modules<br>Positions T-Z             | C146 S24 101 G8<br>C146 S24 102 G8 (2 x PE) |  |  |

| Supplied as                    | for wire gauge | AWG   | Pieces | Part Number      | Figure                                                                               |
|--------------------------------|----------------|-------|--------|------------------|--------------------------------------------------------------------------------------|
| Cable lug for earth connection |                |       |        |                  |                                                                                      |
| Single contact                 | 10 - 16 mm²    | 8 - 6 | 1      | N15 043 0003 003 |  |

| General Characteristics               | Standard        | Value                        |
|---------------------------------------|-----------------|------------------------------|
| Number of contacts                    |                 | 1                            |
| Termination technique                 |                 | crimp                        |
| Wire gauge                            |                 | 25 - 95 mm²<br>(AWG 4 - 000) |
| Max. wire diameter                    |                 | 20 mm                        |
| Flammability                          | UL94            | V-0                          |
| Electrical Characteristics            |                 |                              |
| Rated voltage                         | IEC 60664-1     | 1000 V                       |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                         |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 220 A                        |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves          |
| Installation (overvoltage) category   | IEC 60664-1     | III                          |
| Material group                        | IEC 60664-1     | II                           |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                       |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω         |
| Pollution degree                      | IEC 60664-1     | 3                            |
| Climatical Characteristics            |                 |                              |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                |
| Upper temperature                     | IEC 60512-11-9  | +125°C                       |
| Lower temperature                     | IEC 60512-11-10 | -40°C                        |
| Mechanical Characteristics            |                 |                              |
| IP-degree of protection pin module    | IEC 60529       | unmated IP20, mated IP20     |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20     |
| Weight pin module                     |                 | 10 g                         |
| Weight socket module                  |                 | 20 g                         |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles          |
| Materials                             |                 |                              |
| Module                                |                 | PA                           |
| Colour module                         |                 | black                        |
| Contacts                              |                 | CuZn (brass)                 |
| Contact plating                       |                 | Ag (silver)                  |



- General requirements**
- Due to reduced cross sections at PE contacts of frames, the PE contact has to be additionally protected against short circuits by using a protection circuit offering a sufficiently short breaking time (<0.25s).
  - Parts to be used as connectors, not as plug devices (connector with breaking capacity). Do not mate under current or voltage!

| Description                                                | Part Number     | Drawing | Figure |
|------------------------------------------------------------|-----------------|---------|--------|
| <b>1 contact module (Please order contacts separately)</b> |                 |         |        |
| Pin module 1 contact                                       | C146 A01 001 E8 |         |        |
| Socket module 1 contact                                    | C146 B01 004 E8 |         |        |

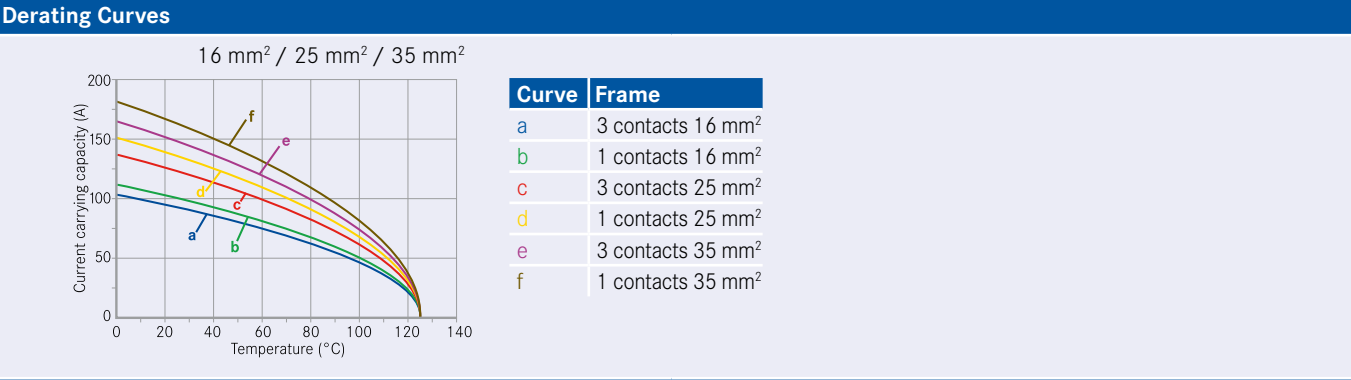
| Supplied as                    | for wire gauge | AWG   | Pieces | Part Number      |                  | Figure                                                                                |
|--------------------------------|----------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                |                |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 10 mm crimp contacts    |                |       |        |                  |                  |                                                                                       |
| Single contact                 | 25 mm²         | 4     | 1      | N01 100 5099 001 | N02 100 6119 002 |   |
|                                | 35 mm²         | 2     | 1      | N01 100 6000 001 | N02 100 6120 002 |                                                                                       |
|                                | 50 mm²         | 1     | 1      | N01 100 6001 001 | N02 100 6121 002 |                                                                                       |
|                                | 70 mm²         | 00    | 1      | N01 100 6002 001 | N02 100 6122 002 |                                                                                       |
|                                | 95 mm²         | 000   | 1      | N01 100 6003 001 | N02 100 6123 002 |                                                                                       |
| Cable lug for earth connection |                |       |        |                  |                  |                                                                                       |
| Single contact                 | 10 - 16 mm²    | 8 - 6 | 1      | N15 043 0003 003 |                  |  |

| Tools         |                |                 |               |      |
|---------------|----------------|-----------------|---------------|------|
| Description   | for wire gauge | Part Number     |               |      |
|               |                | Contact locator | Crimping dies | Tool |
| Crimping dies | 25 mm²         | -               | TE 0600 042   | *    |
|               | 35 mm²         | -               | TE 0600 22    | *    |
|               | 50 mm²         | -               | TE 0500 103   | *    |
|               | 70 mm²         | -               | TE 0500 201   | *    |
|               | 95 mm²         | -               | TE 0500 301   | *    |

\*hydraulic crimping tool EK1 2042 by Klauke or AHPW 400C by Neko .  
Further tools see catalogue “Tools”



| General Characteristics               | Standard        | Value                    |
|---------------------------------------|-----------------|--------------------------|
| Number of contacts                    |                 | 2                        |
| Termination technique                 |                 | crimp                    |
| Wire gauge                            |                 | 16 - 35 mm² (AWG 6 - 2)  |
| Max. wire diameter                    |                 | 12.8 mm                  |
| Flammability                          | UL94            | V-0                      |
| Electrical Characteristics            |                 |                          |
| Rated voltage                         | IEC 60664-1     | 1000 V                   |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                     |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 150 A                    |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves      |
| Installation (overvoltage) category   | IEC 60664-1     | III                      |
| Material group                        | IEC 60664-1     | II                       |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                   |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω     |
| Pollution degree                      | IEC 60664-1     | 3                        |
| Climatical Characteristics            |                 |                          |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21            |
| Upper temperature                     | IEC 60512-11-9  | +125°C                   |
| Lower temperature                     | IEC 60512-11-10 | -40°C                    |
| Mechanical Characteristics            |                 |                          |
| IP-degree of protection pin module    | IEC 60529       | unmated IP20, mated IP20 |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20 |
| Weight pin module                     |                 | 19 g                     |
| Weight socket module                  |                 | 20 g                     |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles      |
| Materials                             |                 |                          |
| Module                                |                 | PA                       |
| Colour module                         |                 | black                    |
| Contacts                              |                 | CuZn (brass)             |
| Contact plating                       |                 | Ag (silver)              |



**General requirements**

- Due to reduced cross sections at PE contacts of frames, the PE contact has to be additionally protected against short circuits by using a protection circuit offering a sufficiently short breaking time (<0.25s).
- Parts to be used as connectors, not as plug devices (connector with breaking capacity). Do not mate under current or voltage!

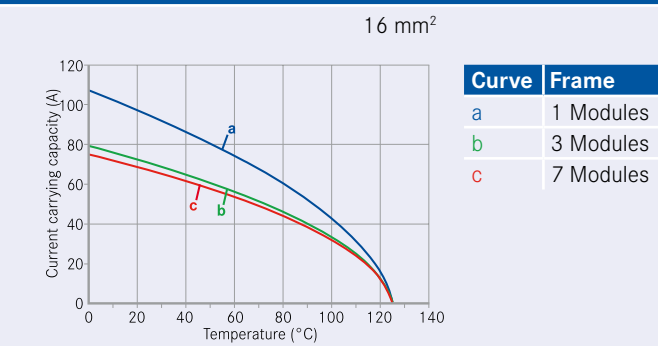
| Description                                                 | Part Number     | Drawing | Figure |
|-------------------------------------------------------------|-----------------|---------|--------|
| <b>2 contacts module (Please order contacts separately)</b> |                 |         |        |
| Pin module 2 contacts                                       | C146 A02 001 E8 |         |        |
| Socket module 2 contacts                                    | C146 B02 001 E8 |         |        |

| Supplied as                    | for wire gauge          | AWG   | Pieces | Part Number      |                  | Figure                                                                                |
|--------------------------------|-------------------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                |                         |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 6 mm crimp contacts     |                         |       |        |                  |                  |                                                                                       |
| Single contact                 | 16 mm <sup>2</sup>      | 6     | 1      | N01 060 0007 1   | N02 060 6117 001 |   |
|                                | 25 mm <sup>2</sup>      | 4     |        | N01 060 0004 1   | N02 060 6114 001 |                                                                                       |
|                                | 35 mm <sup>2</sup>      | 2     |        | N01 060 0008 1   | N02 060 6118 001 |                                                                                       |
| Cable lug for earth connection |                         |       |        |                  |                  |                                                                                       |
| Single contact                 | 10 - 16 mm <sup>2</sup> | 8 - 6 | 1      | N15 043 0003 003 |                  |  |

| Tools                                                                                                    |                |                 |             |   |
|----------------------------------------------------------------------------------------------------------|----------------|-----------------|-------------|---|
| Description                                                                                              | for wire gauge | Contact locator | Part Number |   |
| Crimping dies                                                                                            | 16 mm²         | -               | TE 0600 062 | * |
|                                                                                                          | 25 mm²         | -               | TE 0600 042 | * |
|                                                                                                          | 35 mm²         | -               | TE 0600 022 | * |
| *Hydraulic crimping tool EK12042 by Klauke or AHPW 400C by Neko .<br>Further tools see catalogue "Tools" |                |                 |             |   |

| General Characteristics               | Standard        | Value                    |
|---------------------------------------|-----------------|--------------------------|
| Number of contacts                    |                 | 2                        |
| Termination technique                 |                 | crimp                    |
| Wire gauge                            |                 | 16 (AWG 6)               |
| Max. wire diameter                    |                 | 8.6 mm                   |
| Flammability                          | UL94            | V-0                      |
| Electrical Characteristics            |                 |                          |
| Rated voltage                         | IEC 60664-1     | 1000 V (UL/CSA 600 V)    |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                     |
| Rated Current T <sub>v</sub> = 40 °C  |                 | 65 A                     |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves      |
| Installation (overvoltage) category   | IEC 60664-1     | III                      |
| Material group                        | IEC 60664-1     | II                       |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                   |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω     |
| Pollution degree                      | IEC 60664-1     | 3                        |
| Climatical Characteristics            |                 |                          |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21            |
| Upper temperature                     | IEC 60512-11-9  | +125°C                   |
| Lower temperature                     | IEC 60512-11-10 | -40°C                    |
| Mechanical Characteristics            |                 |                          |
| IP-degree of protection pin module    | IEC 60529       | unmated IP20, mated IP20 |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20 |
| Weight pin module                     |                 | 8 g                      |
| Weight socket module                  |                 | 8 g                      |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles      |
| Materials                             |                 |                          |
| Module                                |                 | PA                       |
| Colour module                         |                 | black                    |
| Contacts                              |                 | CuZn (brass)             |
| Contact plating                       |                 | Ag (silver)              |

Derating curves



General requirements

- Due to reduced cross sections at PE contacts of frames, the PE contact has to be additionally protected against short circuits by using a protection circuit offering a sufficiently short breaking time (<0.25s).
- Parts to be used as connectors, not as plug devices (connector with breaking capacity). Do not mate under current or voltage!

| Description                                                 | Part Number     | Drawing | Figure |
|-------------------------------------------------------------|-----------------|---------|--------|
| <b>2 contacts module (Please order contacts separately)</b> |                 |         |        |
| Pin module 2 contacts                                       | C146 A02 801 E8 |         |        |
| Socket module 2 contacts                                    | C146 B02 801 E8 |         |        |

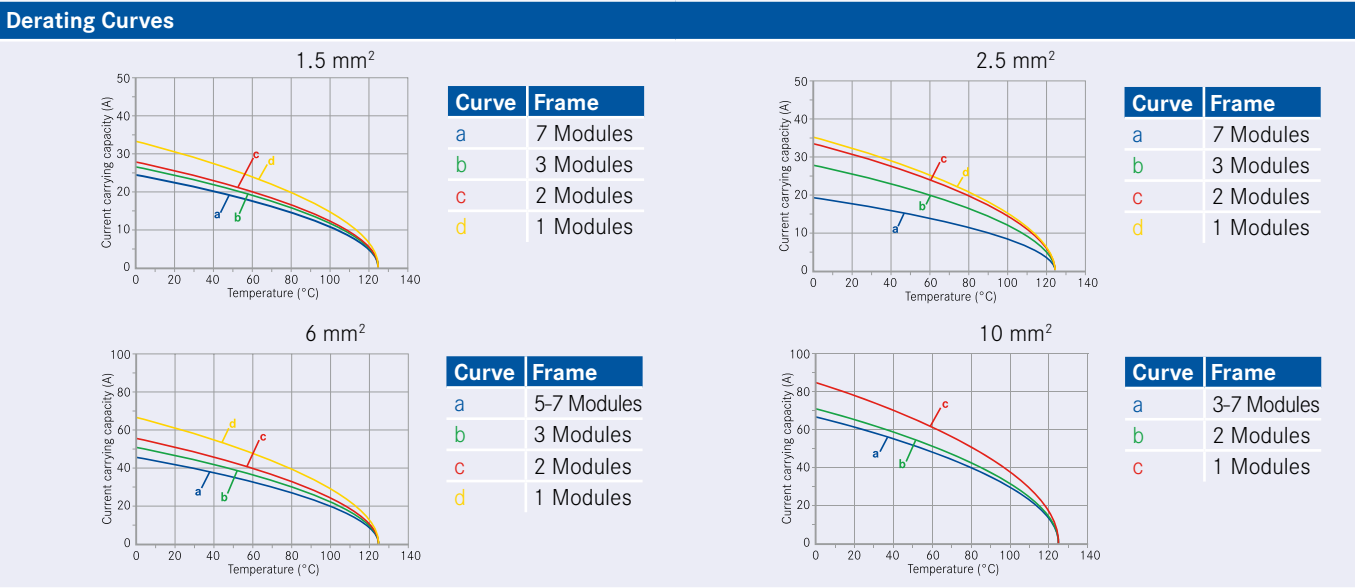
| Supplied as                           | for wire gauge          | AWG   | Pieces | Part Number       |                  | Figure |
|---------------------------------------|-------------------------|-------|--------|-------------------|------------------|--------|
|                                       |                         |       |        | Pin contact       | Socket contact   |        |
| <b>Turned 3.6 mm crimp contacts</b>   |                         |       |        |                   |                  |        |
| Single contact                        | 16 mm <sup>2</sup>      | 6     | 100    | VN01 036 0021 1C  | VN02 036 0021 1C |        |
| <b>Cable lug for earth connection</b> |                         |       |        |                   |                  |        |
| Single contact                        | 10 - 16 mm <sup>2</sup> | 8 - 6 | 1      | N 15 043 0003 003 |                  |        |

| Tools                     |                    |                 |               |      |
|---------------------------|--------------------|-----------------|---------------|------|
| Description               | for wire gauge     | Contact locator | Part Number   |      |
|                           |                    |                 | Crimping dies | Tool |
| Crimping dies             | 16 mm <sup>2</sup> | -               | TE 0600 063   | *    |
| Removal tool for contacts | 16 mm <sup>2</sup> | -               | FG 0300 146 3 | *    |
| Removal tool for modules  | -                  | -               | FG 1000 146   | *    |

\*hydraulic crimping tool EK 60/22-L by Klauke or AHPW 300 by Neko .  
Further tools see catalogue “Tools”



| General Characteristics               | Standard        | Value                                 |
|---------------------------------------|-----------------|---------------------------------------|
| Number of contacts                    |                 | 3                                     |
| Termination technique                 |                 | crimp                                 |
| Wire gauge                            |                 | 1.5 - 10 mm <sup>2</sup> (AWG 16 - 8) |
| Max. wire diameter                    |                 | 7.2 mm                                |
| Flammability                          | UL94            | V-0                                   |
| Electrical Characteristics            |                 |                                       |
| Rated voltage                         | IEC 60664-1     | 1000 V (UL/CSA 600 V)                 |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                                  |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 50 A                                  |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                   |
| Installation (overvoltage) category   | IEC 60664-1     | III                                   |
| Material group                        | IEC 60664-1     | II                                    |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5mΩ                                 |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                  |
| Pollution degree                      | IEC 60664-1     | 3                                     |
| Climatical Characteristics            |                 |                                       |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                         |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                 |
| Mechanical Characteristics            |                 |                                       |
| IP-degree of protection pin module    |                 | unmated IP20, mated IP20              |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20              |
| Weight pin module                     |                 | 8 g                                   |
| Weight socket module                  |                 | 8 g                                   |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                   |
| Materials                             |                 |                                       |
| Module                                |                 | PA                                    |
| Colour module                         |                 | black                                 |
| Contacts                              |                 | CuZn (brass)                          |
| Contact plating                       |                 | Ag (silver)                           |



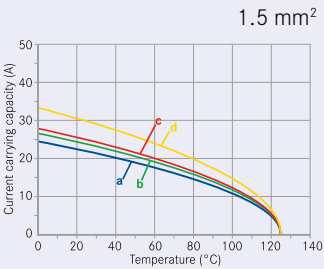
| Description                                                | Part number     | Drawing | Figure |
|------------------------------------------------------------|-----------------|---------|--------|
| <b>Modul 3 contacts (Please order contacts separately)</b> |                 |         |        |
| Pin module 3 contacts                                      | C146 A03 801 E8 |         |        |
| Socket module 3 contacts                                   | C146 B03 801 E8 |         |        |

| Supplied as                                                                     | for wire gauge          | AWG   | Pieces | Part number       |                  | Figure                                                                                |
|---------------------------------------------------------------------------------|-------------------------|-------|--------|-------------------|------------------|---------------------------------------------------------------------------------------|
|                                                                                 |                         |       |        | Pin contact       | Socket contact   |                                                                                       |
| Turned 3.6 mm crimp contacts (All contacts 2 mm first-to-mate to other modules) |                         |       |        |                   |                  |                                                                                       |
| silver plating                                                                  | 1.5 mm <sup>2</sup>     | 16    | 100    | VN01 036 0004 1C  | VN02 036 0004 1C |   |
|                                                                                 | 2.5 mm <sup>2</sup>     | 14    | 100    | VN01 036 0005 1C  | VN02 036 0005 1C |                                                                                       |
|                                                                                 | 4.0 mm <sup>2</sup>     | 12    | 100    | VN01 036 0001 1C  | VN02 036 0001 1C |                                                                                       |
|                                                                                 | 6.0 mm <sup>2</sup>     | 10    | 100    | VN01 036 0002 1C  | VN02 036 0002 1C |                                                                                       |
|                                                                                 | 10.0 mm <sup>2</sup>    | 8     | 100    | VN01 036 0003 1C  | VN02 036 0003 1C |                                                                                       |
| Cable lug for earth connection                                                  |                         |       |        |                   |                  |                                                                                       |
| Single contact                                                                  | 10 – 16 mm <sup>2</sup> | 8 – 6 | 1      | N 15 043 0003 003 |                  |  |

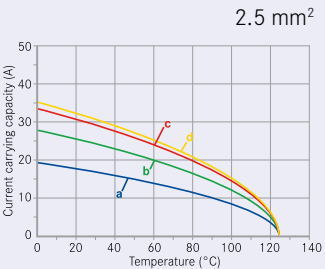
| Tools                                                        |                                                    |                                        |                            |                       |
|--------------------------------------------------------------|----------------------------------------------------|----------------------------------------|----------------------------|-----------------------|
| Description                                                  | for wire gauge                                     | Contact locator                        | Part number                |                       |
|                                                              |                                                    |                                        | Crimping dies              | Tool                  |
| Removal tool for contacts                                    | 1.5 - 10.0 mm <sup>2</sup>                         | -                                      | -                          | FG 0300 146 3         |
| Lösewerkzeug für Module                                      | -                                                  | -                                      | -                          | FG 1000 146           |
| Standard crimping tool and accessories for 4-Indent crimping | 1.5 - 2.5 mm <sup>2</sup><br>4 - 6 mm <sup>2</sup> | TA 0010 146 000 5<br>TA 0010 146 000 4 | TA 0000 144<br>TA 0000 124 | TA 0000 or<br>TA 0500 |
| 4-Indent crimping tool                                       | 1.5 - 10.0 mm <sup>2</sup>                         | -                                      | -                          | TB 0100 148           |
| Further tools see catalogue "Tools"                          |                                                    |                                        |                            |                       |

| General Characteristics               | Standard        | Value                     |
|---------------------------------------|-----------------|---------------------------|
| Number of contacts                    |                 | 3                         |
| Termination technique                 |                 | crimp                     |
| Wire gauge                            |                 | 1.5 - 10 mm² (AWG 16 - 8) |
| Max. wire diameter                    |                 | 7.2 mm                    |
| Flammability                          | UL94            | V-0                       |
| Electrical Characteristics            |                 |                           |
| Rated voltage                         | IEC 60664-1     | 630 V (UL/CSA 600 V)      |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                      |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 40 A                      |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves       |
| Installation (overvoltage) category   | IEC 60664-1     | III                       |
| Material group                        | IEC 60664-1     | II                        |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                    |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω      |
| Pollution degree                      | IEC 60664-1     | 3                         |
| Climatical Characteristics            |                 |                           |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21             |
| Upper temperature                     | IEC 60512-11-9  | +125°C                    |
| Lower temperature                     | IEC 60512-11-10 | -40°C                     |
| Mechanical Characteristics            |                 |                           |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20  |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20  |
| Weight pin module                     |                 | 7 g                       |
| Weight socket module                  |                 | 9 g                       |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles       |
| Materials                             |                 |                           |
| Module                                |                 | PA                        |
| Colour module                         |                 | black                     |
| Contacts                              |                 | CuZn (brass)              |
| Contact plating                       |                 | Ag (silver)               |

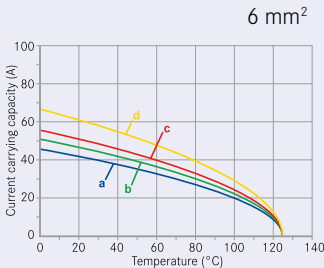
Derating Curves



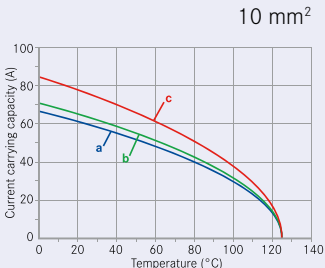
| Curve | Frame     |
|-------|-----------|
| a     | 7 Modules |
| b     | 3 Modules |
| c     | 2 Modules |
| d     | 1 Modules |



| Curve | Frame     |
|-------|-----------|
| a     | 7 Modules |
| b     | 3 Modules |
| c     | 2 Modules |
| d     | 1 Modules |



| Curve | Frame       |
|-------|-------------|
| a     | 5-7 Modules |
| b     | 3 Modules   |
| c     | 2 Modules   |
| d     | 1 Modules   |



| Curve | Frame       |
|-------|-------------|
| a     | 3-7 Modules |
| b     | 2 Modules   |
| c     | 1 Modules   |

| Description                                                 | Part number     | Drawing | Figure |
|-------------------------------------------------------------|-----------------|---------|--------|
| <b>3 contacts module (Please order contacts separately)</b> |                 |         |        |
| Pin module 3 contacts                                       | C146 A03 001 E8 |         |        |
| Socket module 3 contacts                                    | C146 B03 001 E8 |         |        |

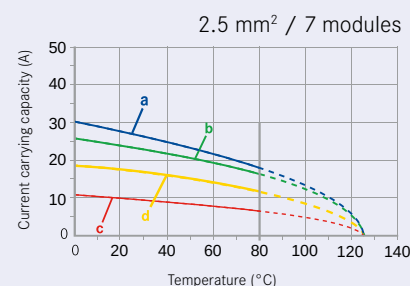
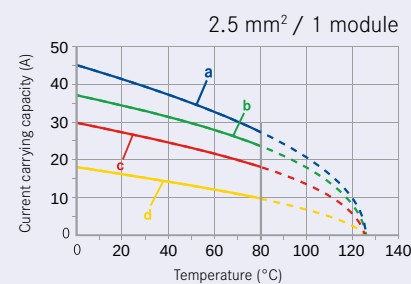
| Supplied as                    | for wire gauge          | AWG   | Pieces | Part number       |                  | Figure                                                                                |
|--------------------------------|-------------------------|-------|--------|-------------------|------------------|---------------------------------------------------------------------------------------|
|                                |                         |       |        | Pin contact       | Socket contact   |                                                                                       |
| Turned 3.6 mm crimp contacts   |                         |       |        |                   |                  |                                                                                       |
| silver plating                 | 1.5 mm <sup>2</sup>     | 16    | 100    | VN01 036 0004 1C  | VN02 036 0004 1C |   |
|                                | 2.5 mm <sup>2</sup>     | 14    | 100    | VN01 036 0005 1C  | VN02 036 0005 1C |                                                                                       |
|                                | 4.0 mm <sup>2</sup>     | 12    | 100    | VN01 036 0001 1C  | VN02 036 0001 1C |                                                                                       |
|                                | 6.0 mm <sup>2</sup>     | 10    | 100    | VN01 036 0002 1C  | VN02 036 0002 1C |                                                                                       |
|                                | 10.0 mm <sup>2</sup>    | 8     | 100    | VN01 036 0003 1C  | VN02 036 0003 1C |                                                                                       |
| Cable lug for earth connection |                         |       |        |                   |                  |                                                                                       |
| Single contact                 | 10 - 16 mm <sup>2</sup> | 8 - 6 | 1      | N 15 043 0003 003 |                  |  |

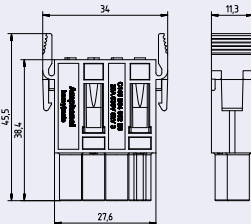
| Tools                                                        |                            |                                        |                            |                       |
|--------------------------------------------------------------|----------------------------|----------------------------------------|----------------------------|-----------------------|
| Description                                                  | for wire gauge             | Contact locator                        | Part number                |                       |
|                                                              |                            |                                        | Crimping dies              | Tool                  |
| Removal tool for contacts                                    | 1.5 - 10.0 mm²             | -                                      | -                          | FG 0300 146 3         |
| Removal tool for modules                                     | -                          | -                                      | -                          | FG 1000 146           |
| Standard crimping tool and accessories for 4-Indent crimping | 1.5 - 2.5 mm²<br>4 - 6 mm² | TA 0010 146 000 5<br>TA 0010 146 000 4 | TA 0000 144<br>TA 0000 124 | TA 0000 or<br>TA 0500 |
| 4-Indent crimping tool                                       | 1.5 - 10.0 mm²             | -                                      | -                          | TB 0100 148           |
| Further tools see catalogue "Tools"                          |                            |                                        |                            |                       |



| General Characteristics               | Standard        | Value                                 |
|---------------------------------------|-----------------|---------------------------------------|
| Number of contacts                    |                 | 4                                     |
| Termination technique                 |                 | crimp                                 |
| Wire gauge                            |                 | 0.5 - 4 mm <sup>2</sup> (AWG 26 - 12) |
| Max. wire diameter                    |                 | 4.6 mm                                |
| Flammability                          | UL94            | V-0                                   |
| Electrical Characteristics            |                 |                                       |
| Rated voltage                         | IEC 60664-1     | 630 V                                 |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                                  |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 25 A                                  |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                   |
| Installation (overvoltage) category   | IEC 60664-1     | III                                   |
| Material group                        | IEC 60664-1     | I                                     |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                  |
| Pollution degree                      | IEC 60664-1     | 3                                     |
| Climatical Characteristics            |                 |                                       |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                         |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                 |
| Mechanical Characteristics            |                 |                                       |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20              |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20              |
| Weight pin module                     |                 | 9 g                                   |
| Weight socket module                  |                 | 8 g                                   |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                   |
| Materials                             |                 |                                       |
| Module                                |                 | PA                                    |
| Colour module                         |                 | black                                 |
| Contacts                              |                 | CuZn (brass)                          |
| Contact plating                       |                 | Ag (silver) / Au (gold)               |

## Derating curves



| Description                                                 | Part Number     | Drawing                                                                             | Figure                                                                              |
|-------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>4 contacts module (Please order contacts separately)</b> |                 |                                                                                     |                                                                                     |
| Pin module 4 contacts                                       | C146 A04 002 E8 |                                                                                     |  |
| Socket module 4 contacts                                    | C146 B04 002 E8 |  |  |

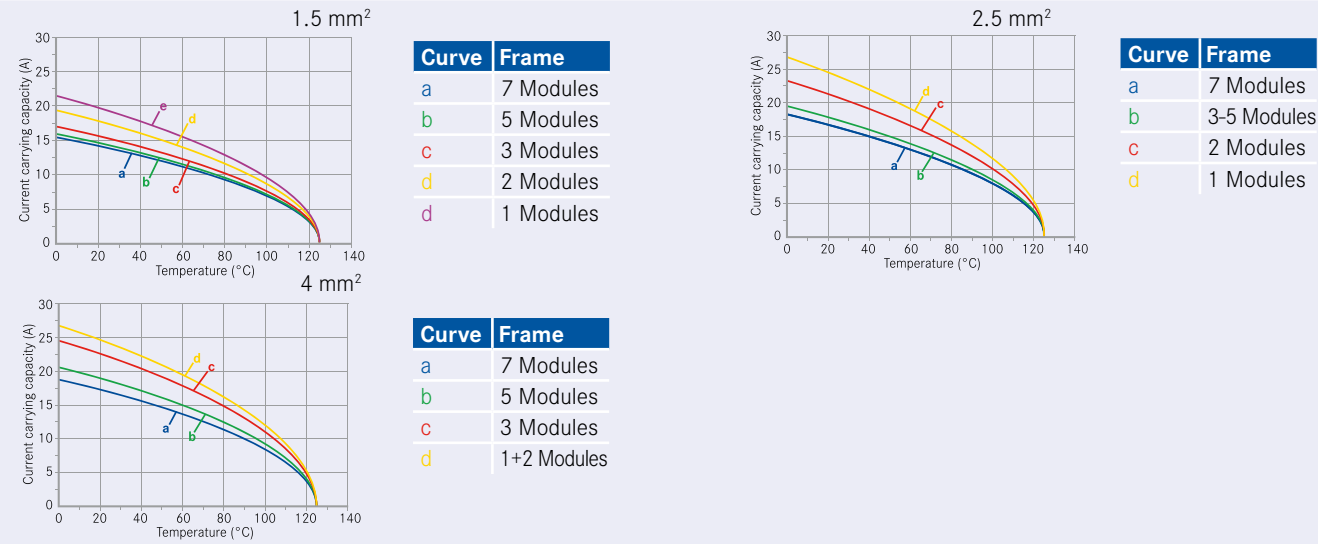
| Supplied as                                        | for wire gauge              | AWG   | Pcs. | Part Number      |                  | Figure                                                                                |
|----------------------------------------------------|-----------------------------|-------|------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                                    |                             |       |      | Pin contact      | Socket contact   |                                                                                       |
| <b>Turned 3.6 mm crimp contacts single contact</b> |                             |       |      |                  |                  |                                                                                       |
| silver plated                                      | 0.14 - 0.37 mm <sup>2</sup> | 26-22 | 100  | VN01 025 0055 1C | VN02 025 0055 1C |   |
|                                                    | 0.5 mm <sup>2</sup>         | 20    | 100  | VN01 025 0035 1C | VN02 025 0035 1C |                                                                                       |
|                                                    | 0.75 - 1.0 mm <sup>2</sup>  | 18    | 100  | VN01 025 0036 1C | VN02 025 0036 1C |                                                                                       |
|                                                    | 1.5 mm <sup>2</sup>         | 16    | 100  | VN01 025 0037 1C | VN02 025 0037 1C |                                                                                       |
|                                                    | 2.5 mm <sup>2</sup>         | 14    | 100  | VN01 025 0038 1C | VN02 025 0038 1C |                                                                                       |
|                                                    | 3.0 mm <sup>2</sup>         | -     | 100  | VN01 025 0059 1C | VN02 025 0059 1C |                                                                                       |
|                                                    | 4.0 mm <sup>2</sup>         | 12    | 100  | VN01 025 0039 1C | VN02 025 0039 1C |                                                                                       |
| gold plated                                        | 0.14 - 0.37 mm <sup>2</sup> | 26-22 | 100  | VN01 025 0055 2C | VN02 025 0055 2C |  |
|                                                    | 0.5 mm <sup>2</sup>         | 20    | 100  | VN01 025 0035 2C | VN02 025 0035 2C |                                                                                       |
|                                                    | 0.75 - 1.0 mm <sup>2</sup>  | 18    | 100  | VN01 025 0036 2C | VN02 025 0036 2C |                                                                                       |
|                                                    | 1.5 mm <sup>2</sup>         | 16    | 100  | VN01 025 0037 2C | VN02 025 0037 2C |                                                                                       |
|                                                    | 2.5 mm <sup>2</sup>         | 14    | 100  | VN01 025 0038 2C | VN02 025 0038 2C |                                                                                       |
|                                                    | 3.0 mm <sup>2</sup>         | -     | 100  | VN01 025 0059 2C | VN02 025 0059 2C |                                                                                       |
|                                                    | 4.0 mm <sup>2</sup>         | 12    | 100  | VN01 025 0039 2C | VN02 025 0039 2C |                                                                                       |

## Tools for turned contacts

| Description                                                  | for wire gauge                                                                        | Part number                                                 |                                           |                       |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------|-----------------------|
|                                                              |                                                                                       | Contact locator                                             | Crimping dies                             | Tool                  |
| Removal tool for contacts                                    | 0.14 - 4.0 mm <sup>2</sup>                                                            | -                                                           | -                                         | FG 0300 146 7         |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 0.37 mm <sup>2</sup><br>0.5 - 2.5 mm <sup>2</sup><br>3.0 - 4.0 mm <sup>2</sup> | TA 0010 146 000 6<br>TA 0010 146 000 7<br>TA 0010 146 000 7 | TA 0000 144<br>TA 0000 124<br>TA 0000 124 | TA 0000 or<br>TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 4.0 mm <sup>2</sup>                                                            | -                                                           | -                                         | TB 0600 146           |
| Further tools see catalogue "Tools"                          |                                                                                       |                                                             |                                           |                       |

| General Characteristics               | Standard        | Value                                 |
|---------------------------------------|-----------------|---------------------------------------|
| Number of contacts                    |                 | 4 / 4 + ⊕ / 5                         |
| Termination technique                 |                 | crimp                                 |
| Wire gauge                            |                 | 0.5 - 4 mm <sup>2</sup> (AWG 20 - 12) |
| Max. wire diameter                    |                 | 4.6 mm                                |
| Flammability                          | UL94            | V-0                                   |
| Electrical Characteristics            |                 |                                       |
| Rated voltage                         | IEC 60664-1     | 1000 V                                |
| Rated impulse withstand voltage       | IEC 60664-1     | 8 kV                                  |
| Rated Current T <sub>v</sub> = 40 °C  |                 | 16 A                                  |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                   |
| Installation (overvoltage) category   | IEC 60664-1     | III                                   |
| Material group                        | IEC 60664-1     | II                                    |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                  |
| Pollution degree                      | IEC 60664-1     | 3                                     |
| Climatical Characteristics            |                 |                                       |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                         |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                 |
| Mechanical Characteristics            |                 |                                       |
| IP-degree of protection pin module    |                 | unmated IP20, mated IP20              |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20              |
| Weight pin module                     |                 | 8 g                                   |
| Weight socket module                  |                 | 7 g                                   |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                   |
| Materials                             |                 |                                       |
| Module                                |                 | PA                                    |
| Colour module                         |                 | black                                 |
| Pin contacts                          |                 | CuZn (brass)                          |
| Socket contact                        |                 | CuSn (bronze)                         |
| Contact plating                       |                 | Ag (silver) / Au (gold)               |

Derating Curves



| Description                                                                                             | Part Number                                                                    | Drawing | Figure |
|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|---------|--------|
| 4 contacts, 4 + ⊕ , 5 contacts module, PE contact 2 mm first-to-mate (Please order contacts separately) |                                                                                |         |        |
| Pin module                                                                                              | C146 D04 001 E8 (4 pol)<br>C146 D05 001 E8 (4 + PE)<br>C146 D05 801 E8 (5 pol) |         |        |
| Socket module                                                                                           | C146 C04 001 E8 (4 pol)<br>C146 C05 001 E8 (4 + PE)<br>C146 C05 801 E8 (5 pol) |         |        |

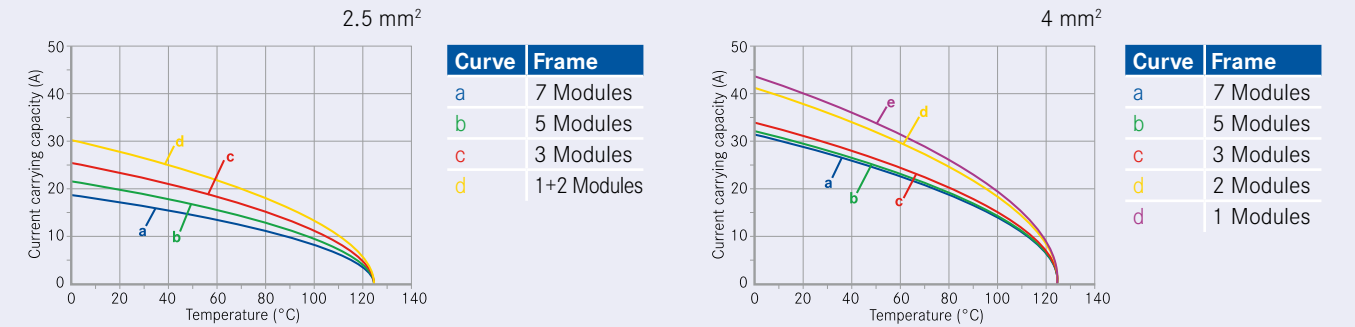
| Supplied as                                                        | for wire gauge            | AWG     | Pieces | Part Number       |                   | Figure                                                                                |
|--------------------------------------------------------------------|---------------------------|---------|--------|-------------------|-------------------|---------------------------------------------------------------------------------------|
|                                                                    |                           |         |        | Pin contact       | Socket contact    |                                                                                       |
| Stamped single contacts                                            |                           |         |        |                   |                   |                                                                                       |
| silver plating                                                     | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16 | 100    | VN01 025 0001 101 | VN02 025 0001 101 |   |
|                                                                    | 1.5 - 2.5 mm <sup>2</sup> | 16 - 14 | 100    | VN01 025 0010 101 | VN02 025 0010 101 |                                                                                       |
|                                                                    | 2.5 - 4.0 mm <sup>2</sup> | 14 - 12 | 100    | VN01 025 0043 1   | VN02 025 0043 1   |                                                                                       |
| gold plating                                                       | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16 | 100    | VN01 025 0001 102 | VN02 025 0001 102 |                                                                                       |
|                                                                    | 1.5 - 2.5 mm <sup>2</sup> | 16 - 14 | 100    | VN01 025 0010 102 | VN02 025 0010 102 |                                                                                       |
|                                                                    | 2.5 - 4 mm <sup>2</sup>   | 14 - 12 | 100    | VN01 025 0043 2   | VN02 025 0043 2   |                                                                                       |
| Stamped Contacts on reel for hand crimp tools                      |                           |         |        |                   |                   |                                                                                       |
| silver plating                                                     | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16 | 200    | ZN01 025 0001 1   | ZN02 025 0001 1   |  |
|                                                                    | 1.5 - 2.5 mm <sup>2</sup> | 16 - 14 | 100    | ZN01 025 0010 1   | ZN02 025 0010 1   |                                                                                       |
| gold plating                                                       | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16 | 200    | ZN01 025 0001 2   | ZN02 025 0001 2   |                                                                                       |
|                                                                    | 1.5 - 2.5 mm <sup>2</sup> | 16 - 14 | 100    | ZN01 025 0010 2   | ZN02 025 0010 2   |                                                                                       |
| Contacts on reel for crimp machines contact feeding left hand side |                           |         |        |                   |                   |                                                                                       |
| silver plating                                                     | 0.5 - 1.5 mm <sup>2</sup> | 20 - 16 | 2000   | TN01 025 0001 1   | TN02 025 0001 1   |  |
|                                                                    | 1.5 - 2.5 mm <sup>2</sup> | 16 - 14 | 2000   | TN01 025 0010 1   | TN02 025 0010 1   |                                                                                       |
|                                                                    | 2.5 - 4 mm <sup>2</sup>   | 12      | 2000   | TN01 025 0043 1   | TN02 025 0043 1   |                                                                                       |

| Tools                             |                           |                   |               |                    |
|-----------------------------------|---------------------------|-------------------|---------------|--------------------|
| Description                       | for wire gauge            | Contact locator   | Part Number   |                    |
|                                   |                           |                   | Crimping dies | Tool               |
| Removal tool for contacts         | 0.5 - 4.0 mm <sup>2</sup> | -                 | -             | FG 0200 146 1      |
| Crimping tool for single contacts | 0.5 - 1.5 mm <sup>2</sup> | TA 0004 146 000 1 | TA 0000 163   | TA 0000 or TA 0500 |
|                                   | 1.5 - 2.5 mm <sup>2</sup> | TA 0005 146 000 3 | TA 0000 141   |                    |
|                                   | 2.5 - 4.0 mm <sup>2</sup> | TA 0003 146 000 1 | TA 0000 121   |                    |

Further tools see catalogue “Tools”



| General Characteristics               | Standard        | Value                                 |
|---------------------------------------|-----------------|---------------------------------------|
| Number of contacts                    |                 | 5                                     |
| Termination technique                 |                 | crimp                                 |
| Wire gauge                            |                 | 0.5 - 4 mm <sup>2</sup> (AWG 20 - 12) |
| Max. wire diameter                    |                 | 4.8 mm                                |
| Flammability                          | UL94            | V-0                                   |
| Electrical Characteristics            |                 |                                       |
| Rated voltage                         | IEC 60664-1     | 400 V (UL/CSA 600 V)                  |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                                  |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 20 A                                  |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                   |
| Installation (overvoltage) category   | IEC 60664-1     | III                                   |
| Material group                        | IEC 60664-1     | II                                    |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5mΩ                                 |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                  |
| Pollution degree                      | IEC 60664-1     | 3                                     |
| Climatical Characteristics            |                 |                                       |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                         |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                 |
| Mechanical Characteristics            |                 |                                       |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20              |
| IP-degree of protection socket module | IEC 60529       | unmated IP00, mated IP20              |
| Weight pin module                     |                 | 5 g                                   |
| Weight socket module                  |                 | 9 g                                   |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                   |
| Materials                             |                 |                                       |
| Module                                |                 | PA                                    |
| Colour module                         |                 | black                                 |
| Contacts                              |                 | CuZn (brass)                          |
| Contact plating                       |                 | Ag (silver)                           |
| Derating curves                       |                 |                                       |

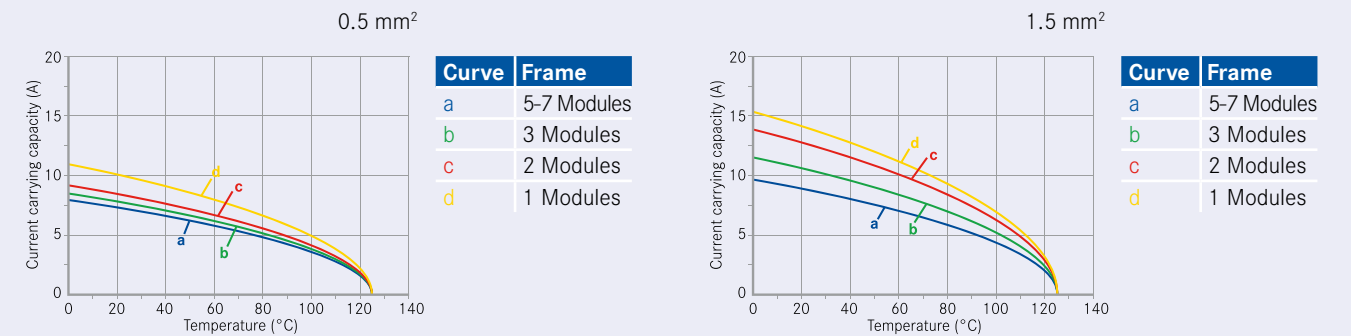


| Description                                                 | Part Number     | Drawing | Figure |
|-------------------------------------------------------------|-----------------|---------|--------|
| <b>5 contacts module (Please order contacts separately)</b> |                 |         |        |
| Pin module 5 contacts                                       | C146 A05 001 E8 |         |        |
| Socket module 5 contacts                                    | C146 B05 001 E8 |         |        |

| Supplied as                         | for wire gauge             | AWG | Pieces | Part Number      |                  | Figure |
|-------------------------------------|----------------------------|-----|--------|------------------|------------------|--------|
|                                     |                            |     |        | Pin contact      | Socket contact   |        |
| <b>Turned 2.5 mm crimp contacts</b> |                            |     |        |                  |                  |        |
| silver plating                      | 0.5 mm <sup>2</sup>        | 20  | 100    | VN01 025 0029 1C | VN02 025 0029 1C |        |
|                                     | 0.75 - 1.0 mm <sup>2</sup> | 18  | 100    | VN01 025 0030 1C | VN02 025 0030 1C |        |
|                                     | 1.5 mm <sup>2</sup>        | 16  | 100    | VN01 025 0031 1C | VN02 025 0031 1C |        |
|                                     | 2.5 mm <sup>2</sup>        | 14  | 100    | VN01 025 0032 1C | VN02 025 0032 1C |        |
|                                     | 4.0 mm <sup>2</sup>        | 12  | 100    | VN01 025 0033 1C | VN02 025 0033 1C |        |

| Tools                                                        |                           |                   |               |                    |
|--------------------------------------------------------------|---------------------------|-------------------|---------------|--------------------|
| Description                                                  | for wire gauge            | Part Number       |               |                    |
|                                                              |                           | Contact locator   | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.5 - 4.0 mm <sup>2</sup> | -                 | -             | FG 0300 146 4      |
| Removal tool for modules                                     | -                         | -                 | -             | FG 1000 146        |
| Standard crimping tool and accessories for 4-Indent crimping | 0.5 - 2.5 mm <sup>2</sup> | TA 0010 146 000 2 | TA 0000 144   | TA 0000 or TA 0500 |
|                                                              | 4.0 mm <sup>2</sup>       | TA 0010 146 000 3 | TA 0000 124   |                    |
| 4-Indent crimping tool                                       | 0.5 - 4.0 mm <sup>2</sup> | -                 | -             | TB 0100 146        |
| Further tools see catalogue "Tools"                          |                           |                   |               |                    |

| General Characteristics               | Standard        | Value                                    |
|---------------------------------------|-----------------|------------------------------------------|
| Number of contacts                    |                 | 10                                       |
| Termination technique                 |                 | crimp                                    |
| Wire gauge                            |                 | 0.14 - 2.5 mm <sup>2</sup> (AWG 26 - 14) |
| Max. wire diameter                    |                 | 3.7 mm                                   |
| Flammability                          | UL94            | V-0                                      |
| Electrical Characteristics            |                 |                                          |
| Rated voltage                         | IEC 60664-1     | 250 V (UL/CSA 600 V)                     |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                                     |
| Rated Current T <sub>v</sub> = 40 °C  |                 | 10 A                                     |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                      |
| Installation (overvoltage) category   | IEC 60664-1     | III                                      |
| Material group                        | IEC 60664-1     | II                                       |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                   |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                     |
| Pollution degree                      | IEC 60664-1     | 3                                        |
| Climatical Characteristics            |                 |                                          |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                            |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                   |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                    |
| Mechanical Characteristics            |                 |                                          |
| IP-degree of protection pin module    |                 | Unmated IP00, mated IP20                 |
| IP-degree of protection socket module | IEC 60529       | Unmated IP20, mated IP20                 |
| Weight pin module                     |                 | 7 g                                      |
| Weight socket module                  |                 | 8 g                                      |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                      |
| Materials                             |                 |                                          |
| Module                                |                 | PA                                       |
| Colour module                         |                 | black                                    |
| Pin contacts                          |                 | CuZn (brass)                             |
| Socket contacts                       |                 | CuSn (bronze)                            |
| Contact plating                       |                 | Ag (silver)                              |
| Derating curves                       |                 |                                          |



| Description                                                  | Part Number     | Drawing | Figure |
|--------------------------------------------------------------|-----------------|---------|--------|
| <b>10 contacts module (Please order contacts separately)</b> |                 |         |        |
| Pin module 10 contacts                                       | C146 D10 001 E8 |         |        |
| Socket module 10 contacts                                    | C146 C10 001 G8 |         |        |

| Supplied as                                   | for wire gauge             | AWG     | Pieces | Part Number     |                 | Figure                                                                                |
|-----------------------------------------------|----------------------------|---------|--------|-----------------|-----------------|---------------------------------------------------------------------------------------|
|                                               |                            |         |        | Pin contact     | Socket contact  |                                                                                       |
| Stamped 1.6 mm crimp contacts                 |                            |         |        |                 |                 |                                                                                       |
| silver plating                                | 0.14 - 0.5 mm <sup>2</sup> | 26 - 20 | 100    | VN01 016 0003 1 | VN02 016 0003 1 |   |
|                                               | 0.5 - 1.5 mm <sup>2</sup>  | 20 - 16 | 100    | VN01 016 0002 1 | VN02 016 0002 1 |                                                                                       |
|                                               | 1.5 - 2.5 mm <sup>2</sup>  | 16 - 14 | 100    | VN01 016 0005 1 | VN02 016 0005 1 |                                                                                       |
| gold plating                                  | 0.14 - 0.5 mm <sup>2</sup> | 26 - 20 | 100    | VN01 016 0003 2 | VN02 016 0003 2 |                                                                                       |
|                                               | 0.5 - 1.5 mm <sup>2</sup>  | 20 - 16 | 100    | VN01 016 0002 2 | VN02 016 0002 2 |                                                                                       |
|                                               | 1.5 - 2.5 mm <sup>2</sup>  | 16 - 14 | 100    | VN01 016 0005 2 | VN02 016 0005 2 |                                                                                       |
| Stamped Contacts on reel for hand crimp tools |                            |         |        |                 |                 |                                                                                       |
| silver plating<br>Standard                    | 0.14 - 0.5 mm <sup>2</sup> | 26 - 20 | 200    | ZN01 016 0003 1 | ZN02 016 0003 1 |  |
|                                               | 0.5 - 1.5 mm <sup>2</sup>  | 20 - 16 | 200    | ZN01 016 0002 1 | ZN02 016 0002 1 |                                                                                       |
|                                               | 1.5 - 2.5 mm <sup>2</sup>  | 16 - 14 | 100    | ZN01 016 0005 1 | ZN02 016 0005 1 |                                                                                       |
| silver plating<br>High current                | 0.5 - 1.5 mm <sup>2</sup>  | 20 - 16 | 200    | ZN01 016 0015 1 | ZN02 016 0015 1 |                                                                                       |
|                                               | 1.5 - 2.5 mm <sup>2</sup>  | 16 - 14 | 100    | ZN01 016 0016 1 | ZN02 016 0016 1 |                                                                                       |
| gold plating<br>Standard                      | 0.14 - 0.5 mm <sup>2</sup> | 26 - 20 | 200    | ZN01 016 0003 2 | ZN02 016 0003 2 |                                                                                       |
|                                               | 0.5 - 1.5 mm <sup>2</sup>  | 20 - 16 | 200    | ZN01 016 0002 2 | ZN02 016 0002 2 |                                                                                       |
|                                               | 1.5 - 2.5 mm <sup>2</sup>  | 16 - 14 | 100    | ZN01 016 0005 2 | ZN02 016 0005 2 |                                                                                       |

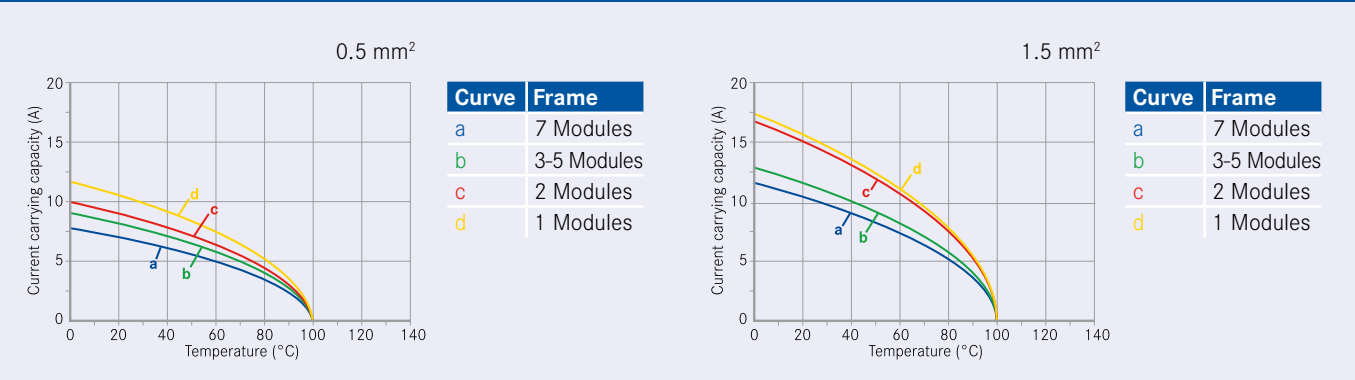
|                                                                                   |                            |         |      |                 |                 |  |
|-----------------------------------------------------------------------------------|----------------------------|---------|------|-----------------|-----------------|--|
| <b>Stamped Contacts on reel for crimp machines contact feeding left hand side</b> |                            |         |      |                 |                 |  |
| silver plating<br>Standard                                                        | 0.14 - 0.5 mm <sup>2</sup> | 26 - 20 | 2000 | TN01 016 0003 1 | TN02 016 0003 1 |  |
|                                                                                   | 0.5 - 1.5 mm <sup>2</sup>  | 20 - 16 | 2000 | TN01 016 0002 1 | TN02 016 0002 1 |  |
|                                                                                   | 1.5 - 2.5 mm <sup>2</sup>  | 16 - 14 | 2000 | TN01 016 0005 1 | TN02 016 0005 1 |  |
| silver plating<br>High current                                                    | 0.5 - 1.5 mm <sup>2</sup>  | 20 - 16 | 2000 | TN01 016 0015 1 | TN02 016 0015 1 |  |
|                                                                                   | 1.5 - 2.5 mm <sup>2</sup>  | 18 - 14 | 2000 | TN01 016 0016 1 | TN02 016 0016 1 |  |
| gold plating<br>Standard                                                          | 0.14 - 0.5 mm <sup>2</sup> | 26 - 20 | 2000 | TN01 016 0003 2 | TN02 016 0003 2 |  |
|                                                                                   | 0.5 - 1.5 mm <sup>2</sup>  | 20 - 16 | 2000 | TN01 016 0002 2 | TN02 016 0002 2 |  |
|                                                                                   | 1.5 - 2.5 mm <sup>2</sup>  | 16 - 14 | 2000 | TN01 016 0005 2 | TN02 016 0005 2 |  |

| Tools                               |                |                   |               |                       |
|-------------------------------------|----------------|-------------------|---------------|-----------------------|
| Description                         | for wire gauge | Part Number       |               |                       |
|                                     |                | Contact locator   | Crimping dies | Tool                  |
| Removal tool for contacts           | 0.14 - 2.5 mm² | -                 | -             | FG 0300 146 1         |
| Removal tools for modules           | -              | -                 | -             | FG 1000 146           |
| Crimping tool for single contacts   | 0.14 - 0.5 mm² | TA 0001 146 000 1 | TA 0000 202   | TA 0000 or<br>TA 0500 |
|                                     | 0.5 - 1.5 mm²  | TA 0002 146 000 1 | TA 0000 163   |                       |
|                                     | 1.5 - 2.5 mm²  | TA 0007 146 000 3 | TA 0000 141   |                       |
| Further tools see catalogue “Tools” |                |                   |               |                       |



| General Characteristics                   | Standard        | Value                        |
|-------------------------------------------|-----------------|------------------------------|
| Number of contacts                        |                 | 10                           |
| Termination technique                     |                 | crimp                        |
| Wire gauge                                |                 | 0.14 - 2.5 mm² (AWG 26 - 14) |
| Max. wire diameter                        |                 | 3.7 mm                       |
| Flammability                              | UL94            | V-0                          |
| Electrical Characteristics                |                 |                              |
| Rated voltage                             | IEC 60664-1     | 250 V (UL/CSA 600 V)         |
| Rated impulse withstand voltage           | IEC 60664-1     | 6 kV                         |
| Rated Current T <sub>u</sub> = 40 °C      |                 | 10 A                         |
| Current carrying capacity                 | IEC 60512-5-2   | see derating curves          |
| Installation (overvoltage) category       | IEC 60664-1     | III                          |
| Material group                            | IEC 60664-1     | II                           |
| Contact resistance                        | IEC 60512-2-1   | ≤ 5m Ω                       |
| Insulation resistance                     | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω         |
| Pollution degree                          | IEC 60664-1     | 3                            |
| Climatical Characteristics                |                 |                              |
| Climatic category                         | IEC 60068-1     | 40 / 125 / 21                |
| Upper temperature                         | IEC 60512-11-9  | +125°C                       |
| Lower temperature                         | IEC 60512-11-10 | -40°C                        |
| Mechanical Characteristics                |                 |                              |
| IP-degree of protection pin insert module | IEC 60529       | unmated IP00, mated IP20     |
| IP-degree of protection socket module     | IEC 60529       | unmated IP20, mated IP20     |
| Weight pin module                         |                 | 7 g                          |
| Weight socket module                      |                 | 8 g                          |
| Mechanical operation                      | IEC 60512-9-1   | ≥ 500 mating cycles          |
| Materials                                 |                 |                              |
| Insert / module                           |                 | PA                           |
| Colour insert / module                    |                 | black                        |
| Pin contacts                              |                 | CuZn (brass)                 |
| Contact plating                           |                 | Ag (silver)                  |

Derating curves



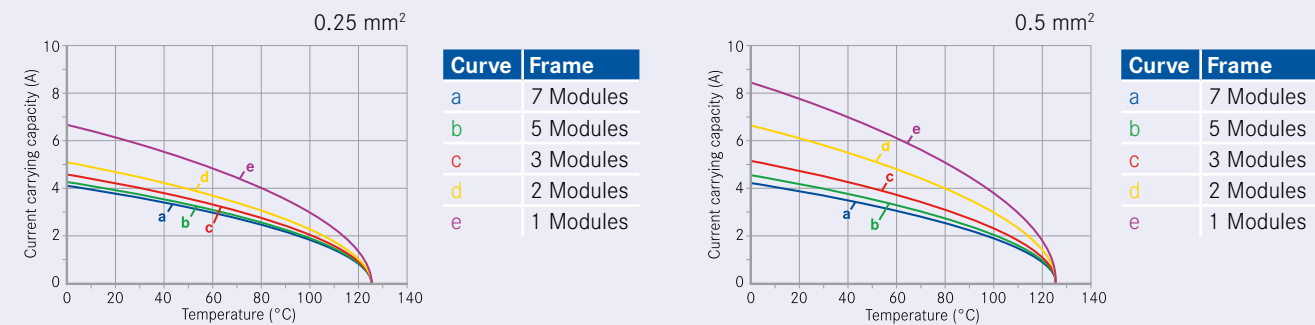
| Description                                                  | Part Number     | Drawing | Figure |
|--------------------------------------------------------------|-----------------|---------|--------|
| <b>10 contacts module (Please order contacts separately)</b> |                 |         |        |
| Pin module 10 contacts                                       | C146 A10 001 E8 |         |        |
| Socket module 10 contacts                                    | C146 B10 001 E8 |         |        |

| Supplied as                                | for wire gauge              | AWG     | Pieces | Part Number       |                   | Figure                                                                                |
|--------------------------------------------|-----------------------------|---------|--------|-------------------|-------------------|---------------------------------------------------------------------------------------|
|                                            |                             |         |        | Pin contact       | Socket contact    |                                                                                       |
| Turned 1.6 mm crimp contacts crimp contact |                             |         |        |                   |                   |                                                                                       |
| silver plating                             | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22 | 100    | VN01 016 0024 1C  | VN02 016 0024 1C  |   |
|                                            | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 016 0025 1C  | VN02 016 0025 1C  |                                                                                       |
|                                            | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16 | 100    | VN01 016 0026 1C  | VN02 016 0026 1C  |                                                                                       |
|                                            | 1.5 mm <sup>2</sup>         | 16 - 15 | 100    | VN01 016 0027 1C  | VN02 016 0027 1C  |                                                                                       |
|                                            | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 016 0028 1C  | VN02 016 0028 1C  |                                                                                       |
| gold plating                               | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22 | 100    | VN01 016 0024 2C  | VN02 016 0024 2C  |  |
|                                            | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 016 0025 2C  | VN02 016 0025 2C  |                                                                                       |
|                                            | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16 | 100    | VN01 016 0026 2C  | VN02 016 0026 2C  |                                                                                       |
|                                            | 1.5 mm <sup>2</sup>         | 16 - 15 | 100    | VN01 016 0027 2C  | VN02 016 0027 2C  |                                                                                       |
|                                            | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 016 0028 2C  | VN02 016 0028 2C  |                                                                                       |
| FO contacts                                |                             |         |        |                   |                   |                                                                                       |
| single contact                             | 1.0 mm POF                  | –       | 10     | VN01 016 0040 8 X | VN02 016 0040 8 X |  |

| Tools                                                        |                |                   |               |                    |
|--------------------------------------------------------------|----------------|-------------------|---------------|--------------------|
| Description                                                  | for wire gauge | Contact locator   | Part Number   |                    |
|                                                              |                |                   | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.14 - 2.5 mm² | -                 | -             | FG 0300 146 1      |
| Removal tool for modules                                     | -              | -                 | -             | FG 1000 146        |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2.5 mm² | TA 0010 146 000 1 | TA 0000 184   | TA 0000 or TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 2.5 mm² | -                 | -             | TB 0400 146        |
| Crimping tool for FO contacts                                | 1.0 mm POF/FO  | -                 | -             | TB 0500 146        |
| Further tools see catalogue “Tools”                          |                |                   |               |                    |

| General Characteristics               | Standard        | Value                                    |
|---------------------------------------|-----------------|------------------------------------------|
| Number of contacts                    |                 | 20                                       |
| Termination technique                 |                 | crimp                                    |
| Wire gauge                            |                 | 0.09 - 0.5 mm <sup>2</sup> (AWG 28 - 20) |
| Max. wire diameter                    |                 | 2 mm                                     |
| Flammability                          | UL94            | V-0                                      |
| Electrical Characteristics            |                 |                                          |
| Rated voltage                         | IEC 60664-1     | 63 V (UL/CSA 50 V)                       |
| Rated impulse withstand voltage       | IEC 60664-1     | 4 kV                                     |
| Rated Current T <sub>v</sub> = 40 °C  |                 | 4 A                                      |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                      |
| Installation (overvoltage) category   | IEC 60664-1     | III                                      |
| Material group                        | IEC 60664-1     | II                                       |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                   |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                     |
| Pollution degree                      | IEC 60664-1     | 3                                        |
| Climatical Characteristics            |                 |                                          |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21                            |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                   |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                    |
| Mechanical Characteristics            |                 |                                          |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20                 |
| IP-degree of protection socket module | IEC 60529       | unmated IP20, mated IP20                 |
| Weight pin module                     |                 | 5 g                                      |
| Weight socket module                  |                 | 7 g                                      |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles                      |
| Materials                             |                 |                                          |
| Module                                |                 | PA                                       |
| Colour module                         |                 | black                                    |
| Contacts                              |                 | CuZn (brass)                             |
| Contact plating                       |                 | Au (gold)                                |

Derating curves



| Description                                                  | Part Number     | Drawing | Figure |
|--------------------------------------------------------------|-----------------|---------|--------|
| <b>20 contacts module (Please order contacts separately)</b> |                 |         |        |
| Pin module 20 contacts                                       | C146 A20 001 G8 |         |        |
| Socket module 20 contacts                                    | C146 B20 001 G8 |         |        |

| Supplied as                                   | for wire gauge  | AWG     | Pieces | Part Number     |                 | Figure                                                                                |
|-----------------------------------------------|-----------------|---------|--------|-----------------|-----------------|---------------------------------------------------------------------------------------|
|                                               |                 |         |        | Pin contact     | Socket contact  |                                                                                       |
| Stamped 1.0 mm crimp contacts                 |                 |         |        |                 |                 |                                                                                       |
| gold plating                                  | 0.09 - 0.14 mm² | 28 - 26 | 100    | VN01 010 0130 2 | VN02 010 0130 2 |   |
|                                               | 0.25 - 0.50 mm² | 24 - 20 | 100    | VN01 010 0131 2 | VN02 010 0131 2 |                                                                                       |
| Stamped Contacts on reel for hand crimp tools |                 |         |        |                 |                 |                                                                                       |
| gold plating                                  | 0.09 - 0.14 mm² | 28 - 26 | 350    | ZN01 010 0130 2 | ZN02 010 0130 2 |  |
|                                               | 0.25 - 0.50 mm² | 24 - 20 | 350    | ZN01 010 0131 2 | ZN02 010 0131 2 |                                                                                       |

|                                                                                   |                             |         |      |                 |                 |  |
|-----------------------------------------------------------------------------------|-----------------------------|---------|------|-----------------|-----------------|--|
| <b>Stamped contacts on reel for crimp machines contact feeding left hand side</b> |                             |         |      |                 |                 |  |
| gold plating                                                                      | 0.09 - 0.14 mm <sup>2</sup> | 28 - 26 | 2000 | TN01 010 0130 2 | TN02 010 0130 2 |  |
|                                                                                   | 0.25 - 0.50 mm <sup>2</sup> | 24 - 20 | 2000 | TN01 010 0131 2 | TN02 010 0131 2 |  |

| Tools                                                        |                             |                  |               |                    |
|--------------------------------------------------------------|-----------------------------|------------------|---------------|--------------------|
| Description                                                  | for wire gauge              | Contact locator  | Part Number   |                    |
|                                                              |                             |                  | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.09 - 0.50 mm <sup>2</sup> | -                | -             | 17D 438 SP         |
| Removal tool for modules                                     | -                           | -                | -             | FG 1000 146        |
| Standard crimping tool and accessories for 4-Indent crimping | 0.09 - 0.25 mm <sup>2</sup> | TA 0001 017 0001 | TA 0000 501   | TA 0000 or TA 0500 |

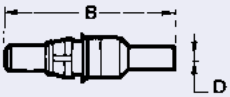
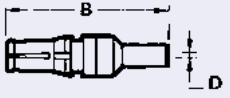
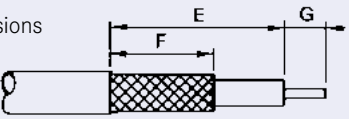
Further tools see catalogue "Tools"



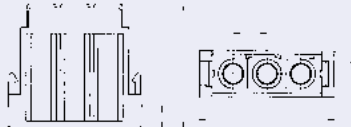
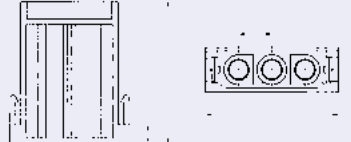
heavy|mate® M Characteristics 3 contacts coax module

| General Characteristics               | Standard        | Value                       |
|---------------------------------------|-----------------|-----------------------------|
| Number of contacts                    |                 | 3                           |
| Termination technique                 |                 | crimp, solder               |
| Max. wire diameter                    |                 | 7.2 mm                      |
| Flammability                          | UL94            | V-0                         |
| Electrical Characteristics            |                 |                             |
| Rated voltage                         | IEC 60664-1     | 250 V                       |
| Rated impulse withstand voltage       |                 | 8 kV                        |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 0.5 A                       |
| Installation (overvoltage) category   | IEC 60664-1     | III                         |
| Material group                        | IEC 60664-1     | II                          |
| Contact resistance                    | IEC 60512-2-1   | ≤ 2.7 mΩ                    |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω        |
| Impedance                             |                 | 50 Ω                        |
| Working frequency                     |                 | 0 – 2 GHz                   |
| Pollution degree                      | IEC 60664-1     | 3                           |
| Climatical Characteristics            |                 |                             |
| Climatic category                     | IEC 60068-1     | 40 / 125 / 21               |
| Upper temperature                     | IEC 60512-11-9  | +125°C                      |
| Lower temperature                     | IEC 60512-11-10 | -40°C                       |
| Mechanical Characteristics            |                 |                             |
| IP-degree of protection pin module    | IEC 60529       | unmated IP00, mated IP20    |
| IP-degree of protection socket module | IEC 60529       | unmated IP00, mated IP20    |
| Weight pin module                     |                 | 7 g                         |
| Weight socket module                  |                 | 9 g                         |
| Mechanical operation                  | IEC 60512-9-1   | ≥ 500 mating cycles         |
| Materials                             |                 |                             |
| Module                                |                 | PA                          |
| Colour module                         |                 | redbrown                    |
| Contacts                              |                 | CuZn (brass), CuSn (bronze) |
| Contact plating                       |                 | Au (gold)                   |

Contact dimensions ( Figure without crimp ferrule)

|                      |                                                                                     |               |                    |     |     |     |     |
|----------------------|-------------------------------------------------------------------------------------|---------------|--------------------|-----|-----|-----|-----|
| Pin contact          |  | Part Number   | B                  | D   | E   | F   | G   |
|                      |                                                                                     | 17 DM 537 401 | 18 <sup>1)</sup>   | 1.6 | 4.6 | 4.3 | 1.9 |
| Socket contact       |  | 17 DM 537 421 | 18 <sup>1)</sup>   | 1.6 | 5.1 | 4.4 | 1.9 |
|                      |                                                                                     | 17 DM 537 405 | 23.6 <sup>2)</sup> | 3.2 | 9.5 | 7.9 | 2   |
| Stripping dimensions |  | 17 DM 537 425 | 23.6 <sup>2)</sup> | 3.2 | 9.5 | 7.9 | 2   |

heavy|mate® M 3 contacts coax module + crimp contacts

| Description                                                      | Part Number     | Drawing                                                                             | Figure                                                                              |
|------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>3 contacts coax module (Please order contacts separately)</b> |                 |                                                                                     |                                                                                     |
| Pin module 3 contacts coax                                       | C146 A03 501 E8 |  |  |
| Socket module 3 contacts coax                                    | C146 B03 501 E8 |  |  |

| Supplied as    | for wire gauge                    | Pieces | Part Number     |                 | Figure                                                                                |
|----------------|-----------------------------------|--------|-----------------|-----------------|---------------------------------------------------------------------------------------|
|                |                                   |        | Pin contact     | Socket contact  |                                                                                       |
| Coax contacts  |                                   |        |                 |                 |                                                                                       |
|                | RG 179, 316                       | 1      | 17 DM 537 401   | 17 DM 537 421   |   |
|                | RG 58                             | 1      | 17 DM 537 405   | 17 DM 537 425   |                                                                                       |
| FO contacts    |                                   |        |                 |                 |                                                                                       |
| single contact | 50 - 62.5 / 125 µm<br>Glass fiber | 10     | VN01 036 0022 X | VN02 036 0022 X |  |

| Tools                               |                    |                  |       |       |                                     |
|-------------------------------------|--------------------|------------------|-------|-------|-------------------------------------|
| Description                         | for cable size     | 6-hex-size in mm |       |       | Part Number                         |
|                                     |                    |                  |       |       | Crimping dies      Tool             |
| Removal tool for contacts           | RG 58, 179, 316    | -                | -     | -     | FG 0300 146 3                       |
| Removal tool for modules            | -                  | -                | -     | -     | FG 1000 146                         |
| Crimping tool for single contacts   | RG 58              | 5.4              | (6.5) | (1.7) | TA 0000 401      TA 0000 or TA 0500 |
|                                     | RG 179, 316        | 3.25             | (4.5) | (1.7) | TA 0000 402      TA 0000 or TA 0500 |
| Crimping tool for FO contacts       | 50 – 62.5 / 125 µm | -                | -     | -     | TB 0800 146                         |
| Further tools see catalogue “Tools” |                    |                  |       |       |                                     |

| Brief information                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 |                          |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------|------------------|
| <div><ul style="list-style-type: none"><li>For integration of standard RJ45 components</li><li>Worldwide real-time access on machines and facilities</li><li>Easy assembly through the use of standard RJ45 components</li><li>One connector for power, signal and data transmission</li><li>4 additional power crimp contacts</li><li>Time- and money saving through the use of similar active- and passive components</li><li>Unitary transmission protocol in the office- and production environment.</li><li>Meets CAT 5 for Ethernet acc. ISO/IEC 11801, suitable for 10/100/1000 Mbps transfer rate</li></ul></div> |                 |                          |                  |
| General Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Standard        | Value module             | Value RJ45       |
| Number of contacts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                 | 4                        | 8                |
| Termination technique                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                 | crimp, solder            | mate             |
| Wire gauge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 | 0.14 - 2.5mm²            | -                |
| Max. wire diameter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                 | 3.7 mm                   | -                |
| Flammability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | UL 94           | V-0                      | V - 0            |
| Electrical Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |                          |                  |
| Rated voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | IEC 60664-1     | 250 V AC                 | 125 V AC         |
| Rated impulse withstand voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | IEC 60664-1     | 6 kV                     | 1.8 kV           |
| Current carrying capacity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | IEC 60512-5-2   | 13 A <sup>1)</sup>       | 1.5 A            |
| Installation (overvoltage) category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | IEC 60664-1     | III                      | III              |
| Material group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IEC 60664-1     | II                       | II               |
| Contact resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | IEC 60512-2-1   | ≤ 5 mΩ                   | ≤ 20 mΩ          |
| Insulation resistance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | IEC 60512-3-1   | 10 <sup>10</sup> Ω       | 5 <sup>8</sup> Ω |
| Pollution degree                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | IEC 60664-1     | 3                        | 3                |
| Climatical Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |                          |                  |
| Climatic category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | IEC 60068-1     | 40 / 125 / 21            | 20 / 8 / 21      |
| Upper temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | IEC 60512-11-9  | + 125 °C                 | + 80 °C          |
| Lower temperature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | IEC 60512-11-10 | -40 °C                   | - 20 °C          |
| Mechanical Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                 |                          |                  |
| IP-degree of protection pin module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | IEC 60529       | unmated IP00, mated IP20 |                  |
| IP-degree of protection socket module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | IEC 60529       | unmated IP20, mated IP20 |                  |
| Weight pin module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                 | 12 g                     |                  |
| Weight socket module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                 | 26 g                     |                  |
| Mechanical operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | IEC 60512-9-1   | ≥ 500 mating cycles      |                  |
| Materials                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |                          |                  |
| Module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                 | PA                       |                  |
| Colour module                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                 | black                    |                  |
| Contacts                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                 | CuZn (brass)             |                  |
| Contact plating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                 | Ag (silver) / Au (gold)  | Au (gold)        |

| Description                                     | Part Number     | Drawing | Figure |
|-------------------------------------------------|-----------------|---------|--------|
| RJ 45 module (Please order contacts separately) |                 |         |        |
| Pin module RJ45                                 | C146 E12 001 E8 |         |        |
| Socket module RJ 45                             | C146 F12 001 G8 |         |        |

| Supplied as                   | for wire gauge              | AWG     | Pieces | Part Number      |                  | Figure                                                                                |
|-------------------------------|-----------------------------|---------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                               |                             |         |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 1.6 mm single contacts |                             |         |        |                  |                  |                                                                                       |
| silver plating                | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |   |
|                               | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 016 0025 1C | VN02 016 0025 1C |                                                                                       |
|                               | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16 | 100    | VN01 016 0026 1C | VN02 016 0026 1C |                                                                                       |
|                               | 1.5 mm <sup>2</sup>         | 16 - 15 | 100    | VN01 016 0027 1C | VN02 016 0027 1C |                                                                                       |
|                               | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 016 0028 1C | VN02 016 0028 1C |                                                                                       |
| gold plating                  | 0.14 - 0.37 mm <sup>2</sup> | 26 - 22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                               | 0.5 mm <sup>2</sup>         | 20      | 100    | VN01 016 0025 2C | VN02 016 0025 2C |                                                                                       |
|                               | 0.75 - 1.0 mm <sup>2</sup>  | 20 - 16 | 100    | VN01 016 0026 2C | VN02 016 0026 2C |                                                                                       |
|                               | 1.5 mm <sup>2</sup>         | 16 - 15 | 100    | VN01 016 0027 2C | VN02 016 0027 2C |                                                                                       |
|                               | 2.5 mm <sup>2</sup>         | 14      | 100    | VN01 016 0028 2C | VN02 016 0028 2C |                                                                                       |

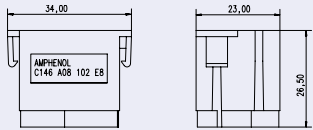
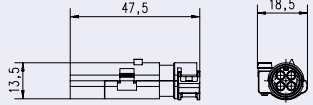
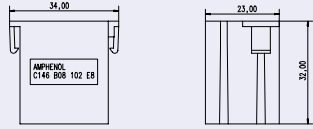
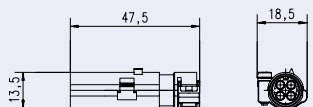
| Tools                                                        |                |                  |               |                    |
|--------------------------------------------------------------|----------------|------------------|---------------|--------------------|
| Description                                                  | for wire gauge | Part number      |               |                    |
|                                                              |                | Contact locator  | Crimping dies | Tool               |
| Removal tool for contacts                                    | -              | -                | -             | FG 0300 146 1      |
| Removal tool for module                                      | -              | -                | -             | FG 1000 146        |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2.5 mm² | TA 0010 146 0001 | TA 0000 184   | TA 0000 or TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 2.5 mm² | -                | -             | TB 0400 146        |
| Further tools see catalogue “Tools”                          |                |                  |               |                    |



| Brief information                                                                                                                                                                                                                                                                                                                                                                                           |                 |                                   |                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------|----------------|
| <div><ul style="list-style-type: none"><li>Power, signal and pneumatic within a single connector</li><li>Very stable brass contacts</li><li>Pneumatic socket contacts with barrier, closes when the connector is open</li><li>Available with single or double connections</li><li>Connection for 2.5 mm or 4 mm PTFE (Teflon)-tubes</li><li>Tubes can be disassembled from the terminations</li></ul></div> |                 |                                   |                |
| General Characteristics                                                                                                                                                                                                                                                                                                                                                                                     | Standard        | Value module                      | Value RJ45     |
| Number of contacts                                                                                                                                                                                                                                                                                                                                                                                          |                 | 1                                 | 2              |
| Termination technique                                                                                                                                                                                                                                                                                                                                                                                       |                 | tube termination                  |                |
| Wire gauge                                                                                                                                                                                                                                                                                                                                                                                                  |                 | 2.5mm² / 4 mm²                    | 2.5mm² / 4 mm² |
| Max. wire diameter                                                                                                                                                                                                                                                                                                                                                                                          |                 | 9.1 mm                            |                |
| Flammability                                                                                                                                                                                                                                                                                                                                                                                                | UL 94           | V-0                               |                |
| Operating pressure                                                                                                                                                                                                                                                                                                                                                                                          |                 | 8 bar with PTFE tube              |                |
| Operating path                                                                                                                                                                                                                                                                                                                                                                                              |                 | 4.0 mm                            |                |
| Locking                                                                                                                                                                                                                                                                                                                                                                                                     |                 | locking on one side               |                |
| Pneumatic tube                                                                                                                                                                                                                                                                                                                                                                                              |                 | only use PTFE tubes <sup>1)</sup> |                |
| Climatical Characteristics                                                                                                                                                                                                                                                                                                                                                                                  |                 |                                   |                |
| Climatic category                                                                                                                                                                                                                                                                                                                                                                                           | IEC 60068-1     | 20 / 100 / 21                     |                |
| Upper temperature                                                                                                                                                                                                                                                                                                                                                                                           | IEC 60512-11-9  | + 100 °C                          |                |
| Lower temperature                                                                                                                                                                                                                                                                                                                                                                                           | IEC 60512-11-10 | - 20 °C                           |                |
| Mechanical Characteristics                                                                                                                                                                                                                                                                                                                                                                                  |                 |                                   |                |
| Weight pin module                                                                                                                                                                                                                                                                                                                                                                                           |                 | 10 g                              | 15 g           |
| Weight socket module                                                                                                                                                                                                                                                                                                                                                                                        |                 | 17 g                              | 26 g           |
| Mechanical operation                                                                                                                                                                                                                                                                                                                                                                                        |                 | ≥ 5000 mating cycles              |                |
| Materials                                                                                                                                                                                                                                                                                                                                                                                                   |                 |                                   |                |
| Module                                                                                                                                                                                                                                                                                                                                                                                                      |                 | PA                                |                |
| Colour module                                                                                                                                                                                                                                                                                                                                                                                               |                 | black                             |                |
| Contacts                                                                                                                                                                                                                                                                                                                                                                                                    |                 | Brass MS 58                       |                |

| Description              | Part Number              | Drawing | Figure |
|--------------------------|--------------------------|---------|--------|
| Pneumatic module         |                          |         |        |
| Pin module1 contact      | C146 G01 014 G8 (2.5 mm) |         |        |
|                          | C146 G01 024 G8 (4.0 mm) |         |        |
| Socket module 1 contact  | C146 H01 034 G8 (2.5 mm) |         |        |
|                          | C146 H01 044 G8 (4.0 mm) |         |        |
| Pin module 2 contacts    | C146 G02 014 G8 (2.5 mm) |         |        |
|                          | C146 G02 024 G8 (4.0 mm) |         |        |
| Socket module 2 contacts | C146 H02 034 G8 (2.5 mm) |         |        |
|                          | C146 H02 044 G8 (4.0 mm) |         |        |

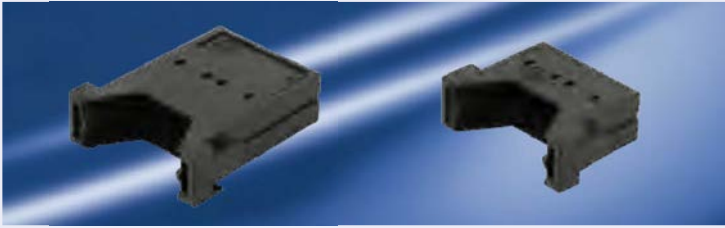
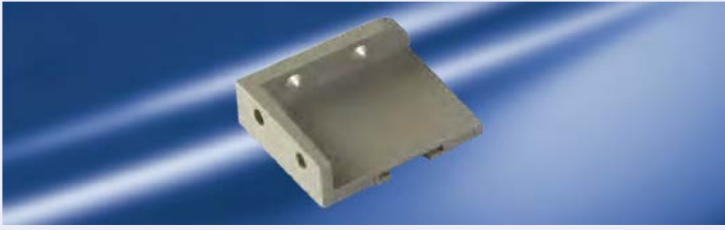
| Kurzinformationen                                                          |                 |                              |
|----------------------------------------------------------------------------|-----------------|------------------------------|
| CAT 5e for Ethernet acc. ISO/IEC 11801, for 10/100/1000 MBit/s data rates. |                 |                              |
| General Characteristics                                                    | Standard        | Value                        |
| Number of contacts                                                         |                 | 4 + shielding                |
| Termination technique                                                      |                 | crimp                        |
| Wire gauge                                                                 |                 | 0.14 - 2.5 mm² (AWG 26 - 14) |
| Max. wire diameter                                                         |                 |                              |
| Flammability                                                               | UL94            | V-0                          |
| Electrical Characteristics                                                 |                 |                              |
| Rated voltage                                                              | IEC 60664-1     | 50 V                         |
| Rated impulse withstand voltage                                            | IEC 60664-1     | 0.8 kV                       |
| Rated Current T <sub>u</sub> = 40 °C                                       |                 | 10 A                         |
| Current carrying capacity                                                  | IEC 60512-5-2   | see derating curves          |
| Installation (overvoltage) category                                        | IEC 60664-1     | III                          |
| Material group                                                             | IEC 60664-1     | IIIb                         |
| Contact resistance                                                         | IEC 60512-2-1   | ≤ 5 mΩ                       |
| Insulation resistance                                                      |                 | ≤ 10 <sup>10</sup> Ω         |
| Pollution degree                                                           | IEC 60664-1     | 3                            |
| Climatical Characteristics                                                 |                 |                              |
| Climatic category                                                          | IEC 60068-1     | 40 / 125 / 21                |
| Upper temperature                                                          | IEC 60512-11-9  | +125°C                       |
| Lower temperature                                                          | IEC 60512-11-10 | -40°C                        |
| Mechanical Characteristics                                                 |                 |                              |
| IP-degree of protection pin module                                         |                 | unmated IP00, mated IP20     |
| IP-degree of protection socket module                                      |                 | unmated IP20, mated IP20     |
| Weight pin module                                                          |                 | 23 g                         |
| Weight socket module                                                       |                 | 25 g                         |
| Mechanical operation                                                       | IEC 60512-9-1   | ≥ 500 mating cycles          |
| Materials                                                                  |                 |                              |
| Module                                                                     |                 | PA                           |
| Colour module                                                              |                 | black                        |
| Contacts                                                                   |                 | CuZn (brass)                 |
| Contact plating                                                            |                 | Au (gold)                    |
| Contact insert                                                             |                 | PC                           |
| Colour contact insert                                                      |                 | grey                         |
| Shielding                                                                  |                 | Zink alloy                   |
| Cable clamp                                                                |                 | Zink alloy                   |

| Description                                                                     | Part Number     | Drawing                                                                               | Figure                                                                                |
|---------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Adaptor modules and Quintax-contact carriers (Please order contacts separately) |                 |                                                                                       |                                                                                       |
| Pin module                                                                      | C146 A08 102 E8 |    |    |
| Quintax pin contact carriers<br>4 contacts                                      | C146 A05 100 G8 |    |    |
| Socket module                                                                   | C146 B08 102 E8 |    |    |
| Quintax socket<br>contact carriers<br>4 contacts                                | C146 B05 100 G8 |  |  |

| Supplied as                 | for wire gauge  | AWG   | Pieces | Part Number      |                  | Figure                                                                                |
|-----------------------------|-----------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                             |                 |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 1.6mm crimp contacts |                 |       |        |                  |                  |                                                                                       |
| gold plating                | 0.14 – 0.37 mm² | 26-22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                             | 0.5 mm²         | 20    | 100    | VN01 016 0025 2C | VN02 016 0025 2C |                                                                                       |
|                             | 0.75 – 1.0 mm²  | 20-16 | 100    | VN01 016 0026 2C | VN02 016 0026 2C |                                                                                       |
|                             | 1.5 mm²         | 16-15 | 100    | VN01 016 0027 2C | VN02 016 0027 2C |                                                                                       |
|                             | 2.5 mm²         | 14    | 100    | VN01 016 0028 2C | VN02 016 0028 2C |                                                                                       |

| Tools                                                        |                 |                  |               |                    |
|--------------------------------------------------------------|-----------------|------------------|---------------|--------------------|
| Description                                                  | for wire gauge  | Part Number      |               |                    |
|                                                              |                 | Contact locator  | Crimping dies | Tool               |
| Removal tool for contacts                                    | 0.14 - 0.37 mm² | -                | -             | FG 0300 146 1      |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 - 2.5 mm²  | TA 0010 146 0001 | TA 00000 184  | TA 0000 or TA 0500 |
| 4-Indent crimping tool                                       | 0.14 - 2.5 mm²  | -                | -             | TB 0400 146        |
| Further tools see catalogue “Tools”                          |                 |                  |               |                    |



| Contact size             | Part Number                                       | Figure                                                                              |
|--------------------------|---------------------------------------------------|-------------------------------------------------------------------------------------|
| Removal tool for modules | FG 1000 146                                       |   |
| Blank modules            | C146 A00 001 E8 (pin)<br>C146 B00 001 E8 (socket) |   |
| Assembly angle           | C146 10Z001 001 8                                 |   |
| Strain relief            | C146 10Z002 001 8                                 |  |



# heavy | mate® Q

- Compact design
- Even in a metal housing
- Rated voltage up to 690 V
- Numbers of contacts: 5, 4/2, 7, 8, 12, 17
- HL3 acc. EN 45545: R22/23

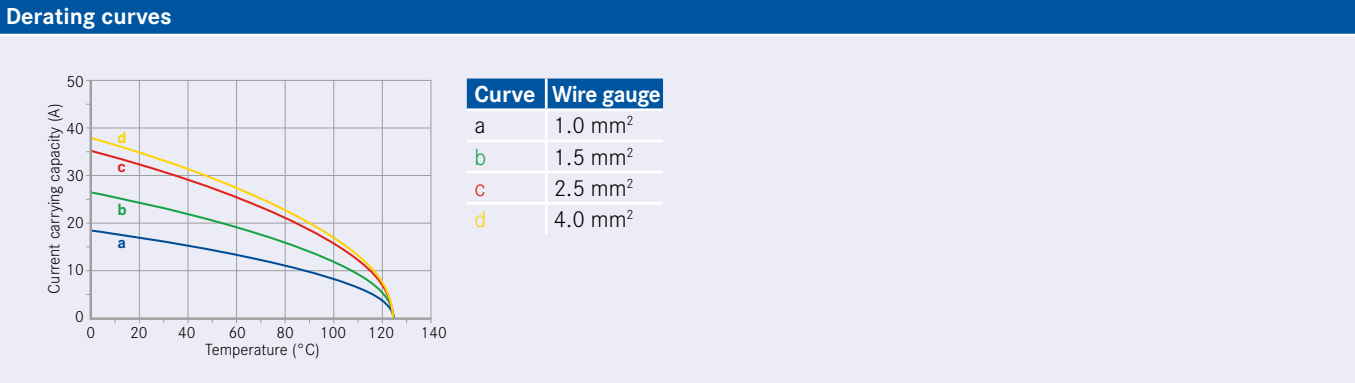
## heavy | mate® Q Brief information



| Approvals, Testhouse                                                                         | Characteristics               | Approval-Number |
|----------------------------------------------------------------------------------------------|-------------------------------|-----------------|
| UL<br>  | see technical characteristics | E 63093         |
| CSA<br> | see technical characteristics | E 63093         |



| General Characteristics               | Standard        | Value                                                                        |
|---------------------------------------|-----------------|------------------------------------------------------------------------------|
| Number of contacts                    |                 | 5 + ⊕                                                                        |
| Termination technique                 |                 | crimp                                                                        |
| Wire gauge                            |                 | 0.5 – 4.0 mm² (AWG 20 -12)                                                   |
| Max. wire diameter                    |                 | 4.6 mm                                                                       |
| Flammability                          | UL94            | V-0                                                                          |
| Electrical Characteristics            |                 |                                                                              |
| Rated voltage                         | IEC 60664-1     | 400 V (conductor – conductor)<br>230 V (conductor – earth)<br>(UL/CSA 600 V) |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                                                                         |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 16 A                                                                         |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                                                          |
| Installation (overvoltage) category   | IEC 60664-1     | III                                                                          |
| Material group                        | IEC 60664-1     | III b                                                                        |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                                                       |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                                         |
| Pollution degree                      | IEC 60664-1     | 3                                                                            |
| Climatical Characteristics            |                 |                                                                              |
| Climatic category                     | IEC 60068-1     | 40/125/21                                                                    |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                                                       |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                                                        |
| Mechanical Characteristics            |                 |                                                                              |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP00, mated IP20                                                     |
| IP-degree of protection socket insert | IEC 60529       | unmated IP20, mated IP20                                                     |
| Weight pin insert                     |                 | 16 g                                                                         |
| Weight socket insert                  |                 | 18 g                                                                         |
| Mechanical operation                  | IEC 60512-9-1   | ≥500 mating cycles                                                           |
| Material                              |                 |                                                                              |
| Insert                                |                 | PC                                                                           |
| Colour insert                         |                 | grey                                                                         |
| Contacts                              |                 | CuZn (brass)                                                                 |
| Contact plating                       |                 | Ag (silver) / Au (gold)                                                      |



| Description                                                    | Part Number        | Drawing | Figure |
|----------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 5 +PE (Please order contacts separately)</b> |                    |         |        |
| Pin insert 5 contacts                                          | C146 10A005 500 12 |         |        |
| Socket insert 5 contacts                                       | C146 10B005 500 12 |         |        |

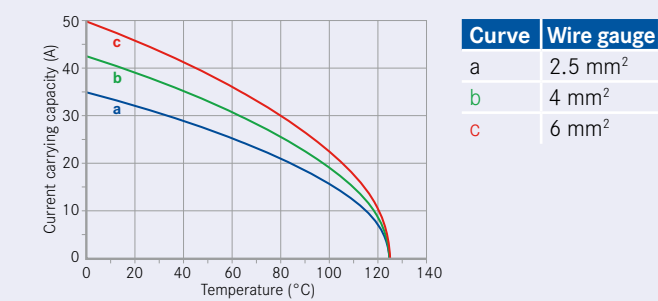
| Contact arrangement |               |
|---------------------|---------------|
| Pin insert          | Socket insert |
|                     |               |

| Supplied as                                 | for wire gauge | AWG   | Pieces | Part Number      |                  | Figure                                                                                |
|---------------------------------------------|----------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                             |                |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 2.5 mm crimp contacts single contact |                |       |        |                  |                  |                                                                                       |
| silver plating                              | 0.14-0.37 mm²  | 22-26 | 100    | VN01 025 0055 1C | VN02 025 0055 1C |  |
|                                             | 0.5 mm²        | 20    | 100    | VN01 025 0035 1C | VN02 025 0035 1C |                                                                                       |
|                                             | 0.75-1.0 mm²   | 18    | 100    | VN01 025 0036 1C | VN02 025 0036 1C |                                                                                       |
|                                             | 1.5 mm²        | 16    | 100    | VN01 025 0037 1C | VN02 025 0037 1C |                                                                                       |
|                                             | 2.5 mm²        | 14    | 100    | VN01 025 0038 1C | VN02 025 0038 1C |                                                                                       |
|                                             | 3.0 mm²        | -     | 100    | VN01 025 0059 1C | VN02 025 0059 1C |                                                                                       |
|                                             | 4.0 mm²        | 12    | 100    | VN01 025 0039 1C | VN02 025 0039 1C |                                                                                       |
| gold plating                                | 0.14-0.37 mm²  | 22-26 | 100    | VN01 025 0055 2C | VN02 025 0055 2C |  |
|                                             | 0.5 mm²        | 20    | 100    | VN01 025 0035 2C | VN02 025 0035 2C |                                                                                       |
|                                             | 0.75-1.0 mm²   | 18    | 100    | VN01 025 0036 2C | VN02 025 0036 2C |                                                                                       |
|                                             | 1.5 mm²        | 16    | 100    | VN01 025 0037 2C | VN02 025 0037 2C |                                                                                       |
|                                             | 2.5 mm²        | 14    | 100    | VN01 025 0038 2C | VN02 025 0038 2C |                                                                                       |
|                                             | 3.0 mm²        | -     | 100    | VN01 025 0059 2C | VN02 025 0059 2C |                                                                                       |
|                                             | 4.0 mm²        | 12    | 100    | VN01 025 0039 2C | VN02 025 0039 2C |                                                                                       |

| Description                                                  | for wire gauge                                    | Part number                                                 |                                           |                       |
|--------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------|-------------------------------------------|-----------------------|
|                                                              |                                                   | Contact locator                                             | Crimping dies                             | Tool                  |
| Removal tool for contacts                                    | 0.14 – 4.0 mm²                                    | -                                                           | -                                         | FG 0300 146 7         |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 – 0.37 mm²<br>0.5 – 2.5 mm²<br>3.0 – 4.0 mm² | TA 0010 146 000 6<br>TA 0010 146 000 7<br>TA 0010 146 000 7 | TA 0000 144<br>TA 0000 124<br>TA 0000 124 | TA 0000 or<br>TA 0500 |
| 4-Indent crimping tool                                       | 0.14 – 4.0 mm²                                    | -                                                           | -                                         | TB 0600 146           |
| Further tools see catalogue "Tools"                          |                                                   |                                                             |                                           |                       |

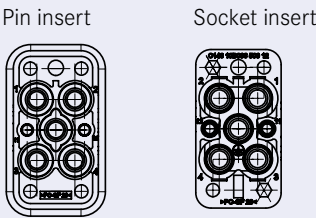
| General Characteristics               | Standard        | Value                                                                                                      |
|---------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------|
| Number of contacts                    |                 | 4 + 2 + ⊕                                                                                                  |
| Termination technique                 |                 | crimp                                                                                                      |
| Wire gauge                            |                 | Power: 1.5 - 6 mm <sup>2</sup> (AWG 16 - 10)<br>Signal: 0.14 - 2.5 mm <sup>2</sup> (AWG 26 - 14)           |
| Max. wire diameter                    |                 | Power: 5.2 mm, Signal: 3.7 mm                                                                              |
| Flammability                          | UL94            | V-0                                                                                                        |
| Electrical Characteristics            |                 |                                                                                                            |
| Rated voltage                         | IEC 60664-1     | Power: 400 V (conductor - earth)<br>690 V (conductor - conductor)<br>Signal: 250 V<br>(UL/ CSA 600, 250 V) |
| Rated impulse withstand voltage       | IEC 60664-1     | Power: 6 kV / 4 kV, Signal: 4 kV                                                                           |
| Rated Current T <sub>u</sub> = 40 °C  |                 | Power: 40 A, Signal: 10 A                                                                                  |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves                                                                                        |
| Installation (overvoltage) category   | IEC 60664-1     | III                                                                                                        |
| Material group                        | IEC 60664-1     | III b                                                                                                      |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                                                                                                     |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω                                                                                       |
| Pollution degree                      | IEC 60664-1     | 3                                                                                                          |
| Climatical Characteristics            |                 |                                                                                                            |
| Climatic category                     | IEC 60068-1     | 40/125/21                                                                                                  |
| Upper temperature                     | IEC 60512-11-9  | +125°C                                                                                                     |
| Lower temperature                     | IEC 60512-11-10 | -40°C                                                                                                      |
| Mechanical Characteristics            |                 |                                                                                                            |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP20, mated IP20                                                                                   |
| IP-degree of protection socket insert | IEC 60529       | unmated IP20, mated IP20                                                                                   |
| Weight pin insert                     |                 | 22 g                                                                                                       |
| Weight socket insert                  |                 | 18 g                                                                                                       |
| Mechanical operation                  | IEC 60512-9-1   | ≥500 mating cycles                                                                                         |
| Material                              |                 |                                                                                                            |
| Insert                                |                 | PC                                                                                                         |
| Colour insert                         |                 | grey                                                                                                       |
| Contacts                              |                 | CuZn (brass)                                                                                               |
| Contact plating                       |                 | Ag (silver), Au (gold)                                                                                     |

Derating curves



| Description                                                        | Part Number        | Drawing | Figure |
|--------------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 4 + 2 + ⊕ (Please order contacts separately)</b> |                    |         |        |
| Pin insert                                                         | C146 10A006 500 12 |         |        |
| Socket insert                                                      | C146 10B006 500 12 |         |        |

Contact arrangement



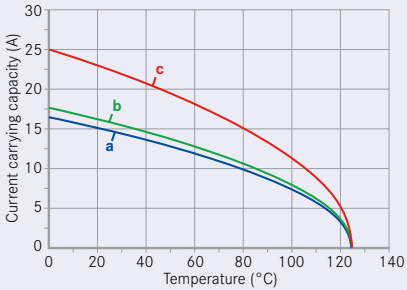
| Supplied as                  | for wire gauge              | AWG   | Pieces | Pin contact      | Socket contact   | Figure                                                                                |
|------------------------------|-----------------------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
| Turned 4 mm crimp contacts   |                             |       |        |                  |                  |                                                                                       |
| silver plating               | 1.5 mm <sup>2</sup>         | 16    | 100    | VN01 040 0010 1C | VN02 040 0010 1C |  |
|                              | 2.5 mm <sup>2</sup>         | 14    | 100    | VN01 040 0011 1C | VN02 040 0011 1C |                                                                                       |
|                              | 4 mm <sup>2</sup>           | 12    | 100    | VN01 040 0012 1C | VN02 040 0012 1C |                                                                                       |
|                              | 6 mm <sup>2</sup>           | 10    | 100    | VN01 040 0013 1C | VN02 040 0013 1C |                                                                                       |
| Turned 1.6 mm crimp contacts |                             |       |        |                  |                  |                                                                                       |
| silver plating               | 0.14 - 0.37 mm <sup>2</sup> | 26-22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |  |
|                              | 0.5 mm <sup>2</sup>         | 20    | 100    | VN01 016 0025 1C | VN02 016 0025 1C |                                                                                       |
|                              | 0.75 - 1.0 mm <sup>2</sup>  | 20-16 | 100    | VN01 016 0026 1C | VN02 016 0026 1C |                                                                                       |
|                              | 1.5 mm <sup>2</sup>         | 16-15 | 100    | VN01 016 0027 1C | VN02 016 0027 1C |                                                                                       |
|                              | 2.5 mm <sup>2</sup>         | 14    | 100    | VN01 016 0028 1C | VN02 016 0028 1C |                                                                                       |
| gold plating                 | 0.14 - 0.37 mm <sup>2</sup> | 26-22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                              | 0.5 mm <sup>2</sup>         | 20    | 100    | VN01 016 0025 2C | VN02 016 0025 2C |                                                                                       |
|                              | 0.75 - 1.0 mm <sup>2</sup>  | 20-16 | 100    | VN01 016 0026 2C | VN02 016 0026 2C |                                                                                       |
|                              | 1.5 mm <sup>2</sup>         | 16-15 | 100    | VN01 016 0027 2C | VN02 016 0027 2C |                                                                                       |
|                              | 2.5 mm <sup>2</sup>         | 14    | 100    | VN01 016 0028 2C | VN02 016 0028 2C |                                                                                       |

\* Please note that these contact inserts are suitable only for thermoplastic housings!



| General Characteristics               | Standard        | Value                        |
|---------------------------------------|-----------------|------------------------------|
| Number of contacts                    |                 | 7 + ☺                        |
| Termination technique                 |                 | crimp                        |
| Wire gauge                            |                 | 0.14 – 2.5 mm² (AWG 26 – 14) |
| Max. wire diameter                    |                 | 4.6 mm                       |
| Flammability                          | UL94            | V-0                          |
| Electrical Characteristics            |                 |                              |
| Rated voltage                         | IEC 60664-1     | 400 V (UL/CSA 600 V)         |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                         |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 10 A                         |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves          |
| Installation (overvoltage) category   | IEC 60664-1     | III                          |
| Material group                        | IEC 60664-1     | III b                        |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                       |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω         |
| Pollution degree                      | IEC 60664-1     | 3                            |
| Climatical Characteristics            |                 |                              |
| Climatic category                     | IEC 60068-1     | 40/125/21                    |
| Upper temperature                     | IEC 60512-11-9  | +125°C                       |
| Lower temperature                     | IEC 60512-11-10 | -40°C                        |
| Mechanical Characteristics            |                 |                              |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP 00, mated IP20    |
| IP-degree of protection socket insert | IEC 60529       | unmated IP 20, mated IP20    |
| Weight pin insert                     |                 | 16 g                         |
| Weight socket insert                  |                 | 16 g                         |
| Mechanical operation                  | IEC 60512-9-1   | ≥500 mating cycles           |
| Material                              |                 |                              |
| Insert                                |                 | PC                           |
| Colour insert                         |                 | grey                         |
| Contacts                              |                 | CuZn (brass)                 |
| Contact plating                       |                 | Ag (silver) / Au (gold)      |

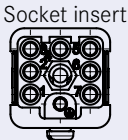
Derating curves



| Curve | Wire gauge |
|-------|------------|
| a     | 0.75 mm²   |
| b     | 1.5 mm²    |
| c     | 2.5 mm²    |

| Description                                                    | Part Number        | Drawing | Figure |
|----------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 7 +PE (Please order contacts separately)</b> |                    |         |        |
| Pin insert 7 contacts                                          | C146 10A007 500 12 |         |        |
| Socket insert 7 contacts                                       | C146 10B007 500 12 |         |        |
| <b>Coding element</b>                                          |                    |         |        |
| Pin insert (10 pieces)                                         | VN17 059 0001 X    |         |        |
| Socket insert (10 Pieces)                                      | VN17 059 0002 X    |         |        |

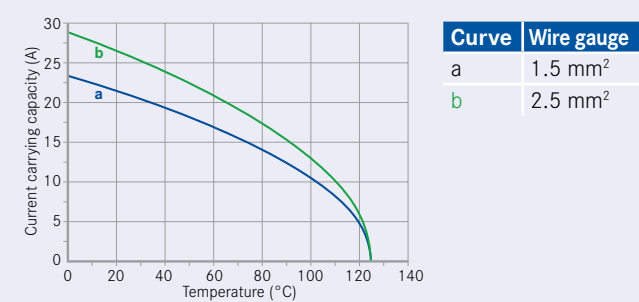
Contact arrangement



| Supplied as                         | for wire gauge  | AWG   | Pieces | Part Number      |                  | Figure |
|-------------------------------------|-----------------|-------|--------|------------------|------------------|--------|
|                                     |                 |       |        | Pin contact      | Socket contact   |        |
| <b>Turned 1.6 mm crimp contacts</b> |                 |       |        |                  |                  |        |
| silver plating                      | 0.14 – 0.37 mm² | 26-22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |        |
|                                     | 0.5 mm²         | 20    | 100    | VN01 016 0025 1C | VN02 016 0025 1C |        |
|                                     | 0.75 – 1.0 mm²  | 20-16 | 100    | VN01 016 0026 1C | VN02 016 0026 1C |        |
|                                     | 1.5 mm²         | 16-15 | 100    | VN01 016 0027 1C | VN02 016 0027 1C |        |
|                                     | 2.5 mm²         | 14    | 100    | VN01 016 0028 1C | VN02 016 0028 1C |        |
| gold plating                        | 0.14 – 0.37 mm² | 26-22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |        |
|                                     | 0.5 mm²         | 20    | 100    | VN01 016 0025 2C | VN02 016 0025 2C |        |
|                                     | 0.75 – 1.0 mm²  | 20-16 | 100    | VN01 016 0026 2C | VN02 016 0026 2C |        |
|                                     | 1.5 mm²         | 16-15 | 100    | VN01 016 0027 2C | VN02 016 0027 2C |        |
|                                     | 2.5 mm²         | 14    | 100    | VN01 016 0028 2C | VN02 016 0028 2C |        |

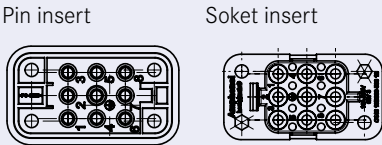
| General Characteristics               | Standard        | Value                       |
|---------------------------------------|-----------------|-----------------------------|
| Number of contacts                    |                 | 8 + ⊕                       |
| Termination technique                 |                 | crimp                       |
| Wire gauge                            |                 | 0.5 – 4.0 mm² (AWG 20 – 12) |
| Max. wire diameter                    |                 | 4.6 mm                      |
| Flammability                          | UL94            | V-0                         |
| Electrical Characteristics            |                 |                             |
| Rated voltage                         | IEC 60664-1     | 500 V (UL/CSA 600 V)        |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                        |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 16 A                        |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves         |
| Installation (overvoltage) category   | IEC 60664-1     | III                         |
| Material group                        | IEC 60664-1     | III b                       |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                      |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω        |
| Pollution degree                      | IEC 60664-1     | 3                           |
| Climatical Characteristics            |                 |                             |
| Climatic category                     | IEC 60068-1     | 40/125/21                   |
| Upper temperature                     | IEC 60512-11-9  | +125 °C                     |
| Lower temperature                     | IEC 60512-11-10 | -40 °C                      |
| Mechanical Characteristics            |                 |                             |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP00, mated IP20    |
| IP-degree of protection socket insert | IEC 60529       | unmated IP20, mated IP20    |
| Weight pin insert                     |                 | 18 g                        |
| Weight socket insert                  |                 | 17 g                        |
| Mechanical operation                  | IEC 60512-9-1   | ≥500 mating cycles          |
| Material                              |                 |                             |
| Insert                                |                 | PC                          |
| Colour insert                         |                 | grey                        |
| Contacts                              |                 | Cu-alloy                    |
| Contact plating                       |                 | Ag (silver) / Au (gold)     |

Derating curves



| Description                                                    | Part Number        | Drawing | Figure |
|----------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 8 + ⊕ (Please order contacts separately)</b> |                    |         |        |
| Pin insert 8 contacts                                          | C146 10A008 500 12 |         |        |
| Socket insert 8 contacts                                       | C146 10B008 500 12 |         |        |

Contact arrangement



| Supplied as                  | for wire gauge | AWG   | Pieces | Part number      |                  | Figure                                                                                |
|------------------------------|----------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                              |                |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 2.5 mm crimp contacts |                |       |        |                  |                  |                                                                                       |
| silver plating               | 0.14-0.37 mm²  | 22-26 | 100    | VN01 025 0055 1C | VN02 025 0055 1C |  |
|                              | 0.5 mm²        | 20    | 100    | VN01 025 0035 1C | VN02 025 0035 1C |                                                                                       |
|                              | 0.75-1.0 mm²   | 18    | 100    | VN01 025 0036 1C | VN02 025 0036 1C |                                                                                       |
|                              | 1.5 mm²        | 16    | 100    | VN01 025 0037 1C | VN02 025 0037 1C |                                                                                       |
|                              | 2.5 mm²        | 14    | 100    | VN01 025 0038 1C | VN02 025 0038 1C |                                                                                       |
|                              | 3.0 mm²        | -     | 100    | VN01 025 0059 1C | VN02 025 0059 1C |                                                                                       |
|                              | 4.0 mm²        | 12    | 100    | VN01 025 0039 1C | VN02 025 0039 1C |                                                                                       |
| gold plating                 | 0.14-0.37 mm²  | 22-26 | 100    | VN01 025 0055 2C | VN02 025 0055 2C |  |
|                              | 0.5 mm²        | 20    | 100    | VN01 025 0035 2C | VN02 025 0035 2C |                                                                                       |
|                              | 0.75-1.0 mm²   | 18    | 100    | VN01 025 0036 2C | VN02 025 0036 2C |                                                                                       |
|                              | 1.5 mm²        | 16    | 100    | VN01 025 0037 2C | VN02 025 0037 2C |                                                                                       |
|                              | 2.5 mm²        | 14    | 100    | VN01 025 0038 2C | VN02 025 0038 2C |                                                                                       |
|                              | 3.0 mm²        | -     | 100    | VN01 025 0059 2C | VN02 025 0059 2C |                                                                                       |
|                              | 4.0 mm²        | 12    | 100    | VN01 025 0039 2C | VN02 025 0039 2C |                                                                                       |

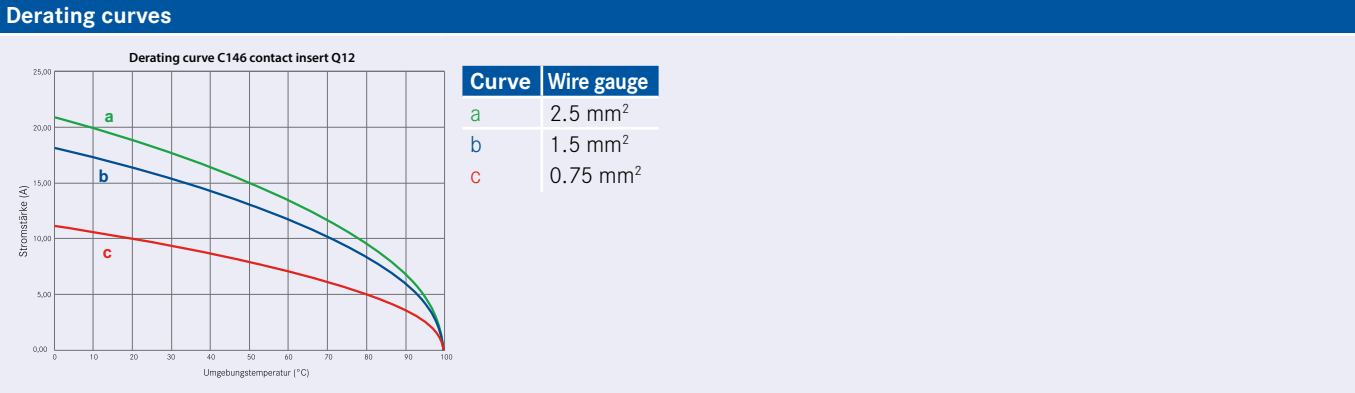
Tools for turned contacts

| Description                                                  | for wire gauge                                    | Part number                                                 |                                           |                       |
|--------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------------|-------------------------------------------|-----------------------|
|                                                              |                                                   | Contact locator                                             | Crimping dies                             | Tool                  |
| Removal tool for contacts                                    | 0.14 – 4.0 mm²                                    | -                                                           | -                                         | FG 0300 146 7         |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 – 0.37 mm²<br>0.5 – 2.5 mm²<br>3.0 – 4.0 mm² | TA 0010 146 000 6<br>TA 0010 146 000 7<br>TA 0010 146 000 7 | TA 0000 144<br>TA 0000 124<br>TA 0000 124 | TA 0000 or<br>TA 0500 |
| 4-Indent crimping tool                                       | 0.14 – 4.0 mm²                                    | -                                                           | -                                         | TB 0600 146           |

Further tools see catalogue "tools"



| General Characteristics               | Standard        | Value                        |
|---------------------------------------|-----------------|------------------------------|
| Number of contacts                    |                 | 12 + ⊕                       |
| Termination technique                 |                 | crimp                        |
| Wire gauge                            |                 | 0.14 – 2.5 mm² (AWG 26 – 14) |
| Max. wire diameter                    |                 | 3.7 mm                       |
| Flammability                          | UL94            | V-0                          |
| Electrical Characteristics            |                 |                              |
| Rated voltage                         | IEC 60664-1     | 400 V (UL/CSA 600 V)         |
| Rated impulse withstand voltage       | IEC 60664-1     | 6 kV                         |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 10 A                         |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves          |
| Installation (overvoltage) category   | IEC 60664-1     | III                          |
| Material group                        | IEC 60664-1     | III b                        |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                       |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω         |
| Pollution degree                      | IEC 60664-1     | 3                            |
| Climatical Characteristics            |                 |                              |
| Climatic category                     | IEC 60068-1     | 40/125/21                    |
| Upper temperature                     | IEC 60512-11-9  | +125 °C                      |
| Lower temperature                     | IEC 60512-11-10 | -40 °C                       |
| Mechanical Characteristics            |                 |                              |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP00, mated IP20     |
| IP-degree of protection socket insert | IEC 60529       | unmated IP20, mated IP20     |
| Weight pin insert                     |                 | 12 g                         |
| Weight socket insert                  |                 | 15 g                         |
| Mechanical operation                  | IEC 60512-9-1   | ≥500 mating cycles           |
| Material                              |                 |                              |
| Insert                                |                 | PC                           |
| Colour insert                         |                 | grey                         |
| Contacts                              |                 | CuZn (brass)                 |
| Contact plating                       |                 | Ag (silver) / Au (gold)      |



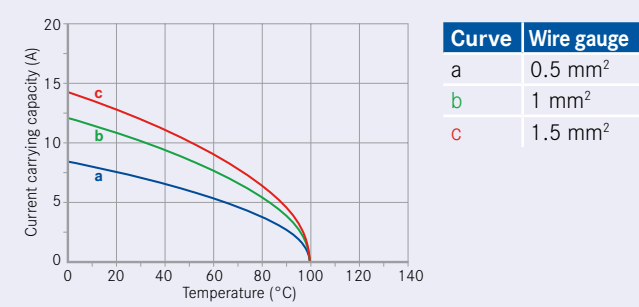
| Description                                              | Part Number        | Drawing | Figure |
|----------------------------------------------------------|--------------------|---------|--------|
| Contact insert 12 + ⊕ (Please order contacts separately) |                    |         |        |
| Pin insert 12 contacts                                   | C146 10A012 500 12 |         |        |
| Socket insert 12 contacts                                | C146 10B012 500 12 |         |        |
| Coding element                                           |                    |         |        |
| Coding element (10 Pieces)                               | VN17 028 0001 X    |         |        |

| Contact arrangement |               |
|---------------------|---------------|
| Pin insert          | Socket insert |
|                     |               |

| Supplied as                  | for wire gauge              | AWG   | Pieces | Part Number      |                  | Figure                                                                                |
|------------------------------|-----------------------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                              |                             |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 1.6 mm crimp contacts |                             |       |        |                  |                  |                                                                                       |
| silver plating               | 0.14 – 0.37 mm <sup>2</sup> | 26-22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |  |
|                              | 0.5 mm <sup>2</sup>         | 20    | 100    | VN01 016 0025 1C | VN02 016 0025 1C |                                                                                       |
|                              | 0.75 – 1.0 mm <sup>2</sup>  | 20-16 | 100    | VN01 016 0026 1C | VN02 016 0026 1C |                                                                                       |
|                              | 1.5 mm <sup>2</sup>         | 16-15 | 100    | VN01 016 0027 1C | VN02 016 0027 1C |                                                                                       |
|                              | 2.5 mm <sup>2</sup>         | 14    | 100    | VN01 016 0028 1C | VN02 016 0028 1C |                                                                                       |
| gold plating                 | 0.14 – 0.37 mm <sup>2</sup> | 26-22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                              | 0.5 mm <sup>2</sup>         | 20    | 100    | VN01 016 0025 2C | VN02 016 0025 2C |                                                                                       |
|                              | 0.75 – 1.0 mm <sup>2</sup>  | 20-16 | 100    | VN01 016 0026 2C | VN02 016 0026 2C |                                                                                       |
|                              | 1.5 mm <sup>2</sup>         | 16-15 | 100    | VN01 016 0027 2C | VN02 016 0027 2C |                                                                                       |
|                              | 2.5 mm <sup>2</sup>         | 14    | 100    | VN01 016 0028 2C | VN02 016 0028 2C |                                                                                       |

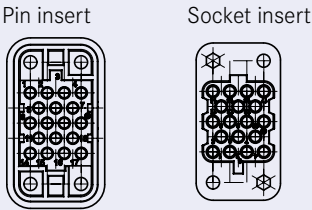
| General Characteristics               | Standard        | Value                        |
|---------------------------------------|-----------------|------------------------------|
| Number of contacts                    |                 | 17 + ⊕                       |
| Termination technique                 |                 | crimp                        |
| Wire gauge                            |                 | 0.14 – 2.5 mm² (AWG 26 – 14) |
| Max. wire diameter                    |                 | 3.7 mm                       |
| Flammability                          | UL94            | V-0                          |
| Electrical Characteristics            |                 |                              |
| Rated voltage                         | IEC 60664-1     | 250 V (UL/CSA 250 V)         |
| Rated impulse withstand voltage       | IEC 60664-1     | 4 kV                         |
| Rated Current T <sub>u</sub> = 40 °C  |                 | 10 A                         |
| Current carrying capacity             | IEC 60512-5-2   | see derating curves          |
| Installation (overvoltage) category   | IEC 60664-1     | III                          |
| Material group                        | IEC 60664-1     | III b                        |
| Contact resistance                    | IEC 60512-2-1   | ≤ 5 mΩ                       |
| Insulation resistance                 | IEC 60512-3-1   | ≥ 10 <sup>10</sup> Ω         |
| Pollution degree                      | IEC 60664-1     | 3                            |
| Climatical Characteristics            |                 |                              |
| Climatic category                     | IEC 60068-1     | 40/125/21                    |
| Upper temperature                     | IEC 60512-11-9  | +125 °C                      |
| Lower temperature                     | IEC 60512-11-10 | -40 °C                       |
| Mechanical Characteristics            |                 |                              |
| IP-degree of protection pin insert    | IEC 60529       | unmated IP00, mated IP20     |
| IP-degree of protection socket insert | IEC 60529       | unmated IP20, mated IP20     |
| Weight pin insert                     |                 | 16 g                         |
| Weight socket insert                  |                 | 14 g                         |
| Mechanical operation                  | IEC 60512-9-1   | ≥500 mating cycles           |
| Material                              |                 |                              |
| Insert                                |                 | PC                           |
| Colour insert                         |                 | grey                         |
| Contacts                              |                 | CuZn (brass)                 |
| Contact plating                       |                 | Ag (silver) / Au (gold)      |

Derating curves



| Description                                                     | Part Number        | Drawing | Figure |
|-----------------------------------------------------------------|--------------------|---------|--------|
| <b>Contact insert 17 + ⊕ (Please order contacts separately)</b> |                    |         |        |
| Pin insert 17 contacts                                          | C146 10A017 500 12 |         |        |
| Socket insert 17 contacts                                       | C146 10B017 500 12 |         |        |

Contact arrangement



| Supplied as                                 | for wire gauge              | AWG   | Pieces | Part Number      |                  | Figure                                                                                |
|---------------------------------------------|-----------------------------|-------|--------|------------------|------------------|---------------------------------------------------------------------------------------|
|                                             |                             |       |        | Pin contact      | Socket contact   |                                                                                       |
| Turned 1.6 mm crimp contacts single contact |                             |       |        |                  |                  |                                                                                       |
| silver plating                              | 0.14 - 0.37 mm <sup>2</sup> | 26-22 | 100    | VN01 016 0024 1C | VN02 016 0024 1C |  |
|                                             | 0.5 mm <sup>2</sup>         | 20    | 100    | VN01 016 0025 1C | VN02 016 0025 1C |                                                                                       |
|                                             | 0.75 – 1.0 mm <sup>2</sup>  | 20-16 | 100    | VN01 016 0026 1C | VN02 016 0026 1C |                                                                                       |
|                                             | 1.5 mm <sup>2</sup>         | 16-15 | 100    | VN01 016 0027 1C | VN02 016 0027 1C |                                                                                       |
|                                             | 2.5 mm <sup>2</sup>         | 14    | 100    | VN01 016 0028 1C | VN02 016 0028 1C |                                                                                       |
| gold plating                                | 0.14 - 0.37 mm <sup>2</sup> | 26-22 | 100    | VN01 016 0024 2C | VN02 016 0024 2C |  |
|                                             | 0.5 mm <sup>2</sup>         | 20    | 100    | VN01 016 0025 2C | VN02 016 0025 2C |                                                                                       |
|                                             | 0.75 – 1.0 mm <sup>2</sup>  | 20-16 | 100    | VN01 016 0026 2C | VN02 016 0026 2C |                                                                                       |
|                                             | 1.5 mm <sup>2</sup>         | 16-15 | 100    | VN01 016 0027 2C | VN02 016 0027 2C |                                                                                       |
|                                             | 2.5 mm <sup>2</sup>         | 14    | 100    | VN01 016 0028 2C | VN02 016 0028 2C |                                                                                       |

Tools for turned contacts

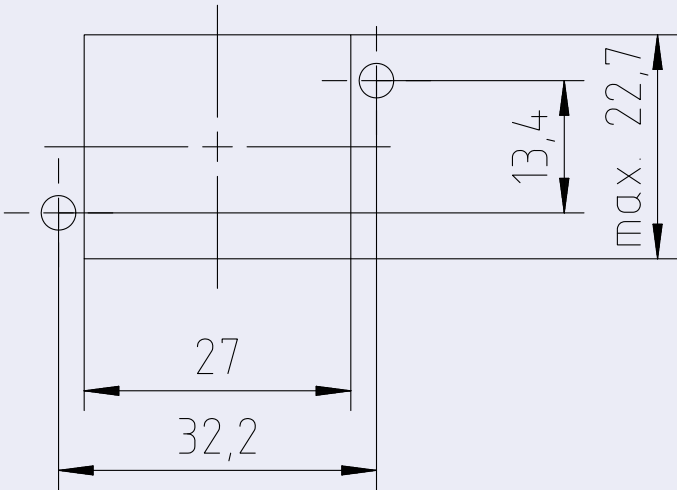
| Description                                                  | for wire gauge | Part number      |               |                    |
|--------------------------------------------------------------|----------------|------------------|---------------|--------------------|
|                                                              |                | Contact locator  | Crimping dies | Tool               |
| Removal tool for contacts                                    | -              | -                | -             | FG 0300 146 1      |
| Standard crimping tool and accessories for 4-Indent crimping | 0.14 – 2.5 mm² | TA 0010 146 0001 | TA 0000 184   | TA 0000 or TA 0500 |
| 4-Indent crimping tool                                       | 0.14 – 2.5 mm² | -                | -             | TB 0400 146        |

Further tools see catalogue "Tools"



| General Characteristics         | Standard                        | Value               |
|---------------------------------|---------------------------------|---------------------|
| Protection class housing        |                                 | IP65                |
| Locking system                  | DIN EN 175 301-801 (DIN 43 652) | locking levers      |
| Salt mist resistance            | IEC 60512-11-6:2002             | >500h               |
| Climatical Characteristics      |                                 |                     |
| Climatic category               | IEC 60068-1                     | 40 / 125 / 21       |
| Temperature range               | IEC 60068-1                     | - 40 °C / + 125 °C  |
| Upper temperature               | IEC 60512-11-9                  | + 125 °C            |
| Lower temperature               | IEC 60512-11-10                 | - 40 °C             |
| Mechanical Characteristics      |                                 |                     |
| Mechanical operation            | IEC 60512-9-1                   | ≥ 500 mating cycles |
| Materials thermoplastic housing |                                 |                     |
| Housings                        |                                 | PA                  |
| Rubber gasket                   |                                 | NBR                 |
| Locking lever                   |                                 | PA                  |
| Colour                          |                                 | black               |
| Materials metal housing         |                                 |                     |
| Housings                        |                                 | Cu-alloy            |
| Rubber gasket                   |                                 | NBR                 |
| Locking lever                   |                                 | Steel / zinc coated |
| Colour                          |                                 | grey                |

Panel cut out



| Description                                | Clamp range                                                                          | Part Number                                                                                                    | Drawing | Figure |
|--------------------------------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------|--------|
| Hoods                                      |                                                                                      |                                                                                                                |         |        |
| Hood top entry thermoplastic               |                                                                                      | C146 10R008 606 12                                                                                             |         |        |
| Hood top entry metal                       |                                                                                      | C146 10R008 650 12                                                                                             |         |        |
| Hood side entry metal, only for Q8 and Q17 |                                                                                      | C146 10R008 550 12                                                                                             |         |        |
| Housings                                   |                                                                                      |                                                                                                                |         |        |
| Housing thermoplastic                      |                                                                                      | C146 10F008 001 12                                                                                             |         |        |
| Housing metal                              |                                                                                      | C146 30F008 001 12                                                                                             |         |        |
| Glands for thermoplastic housing           |                                                                                      |                                                                                                                |         |        |
| Gland bushing<br>10 Pieces                 | 4 - 6.5 mm<br>5 - 8 mm<br>6.5 - 9.5 mm<br>7 - 10.5 mm<br>9 - 13 mm<br>11.5 - 15.5 mm | VN16 250 0020 X<br>VN16 250 0021 X<br>VN16 250 0022 X<br>VN16 250 0023 X<br>VN16 250 0024 X<br>VN16 250 0025 X |         |        |
| Glands for metal housings                  |                                                                                      |                                                                                                                |         |        |
| Gland bushing<br>10 Pieces                 | 11 - 18 mm                                                                           | VN16 250 0133 X                                                                                                |         |        |





# heavy|mate® Housings

## Available Types

- **Standard-Housings IP65** see page 216
- **Housings in IP67** see page 254
- **Housings in IP68** see page 262
- **EMC-Housings** see page 270
- **Corrosion resistant Housings** see page 278



## heavy|mate® Housings standard Brief information



## General information

- The connectors of our **heavy|mate®** series are designed for use in machine tools, general electric installations and applications as well as for industrial control and other electrical equipment. Other applications than the above mentioned are in the responsibility of the user.
- For cable to cable connections a suitable cable clamp has to be used.
- The indicated dimensions with the panel cut-outs represent reference values and are in the concrete application with products to be co-ordinated.
- The sealing area of the housing has to be level and free of burrs.
- Housings in accordance with DIN EN 175 301 - 801 (DIN 43 652) .



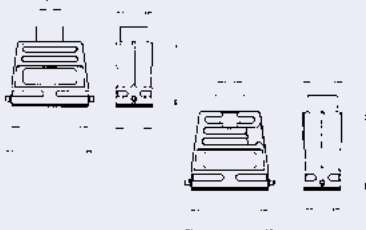
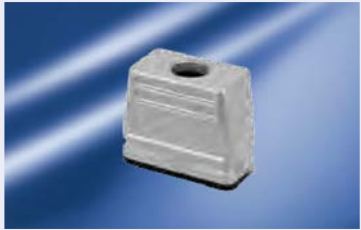
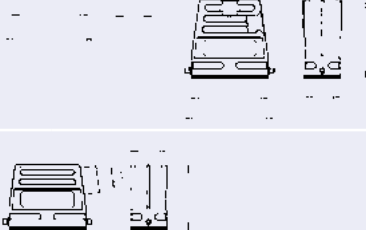
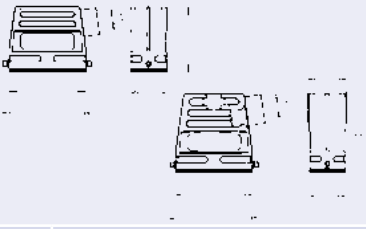
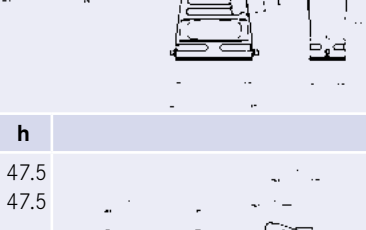
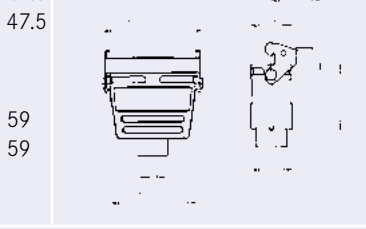
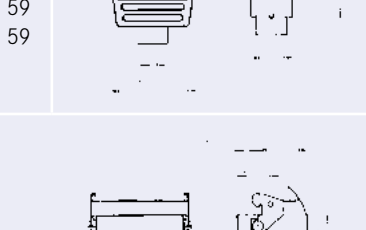
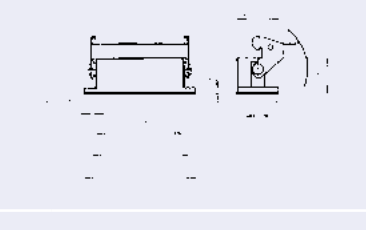
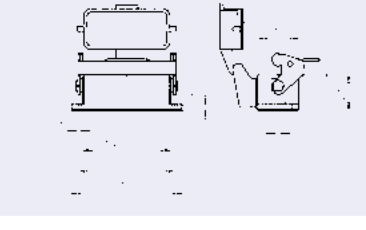


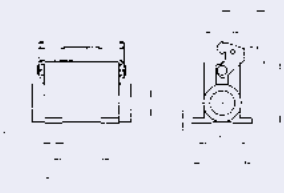
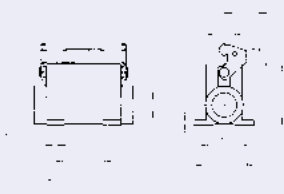
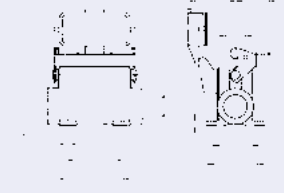
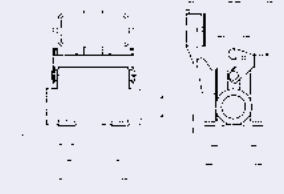
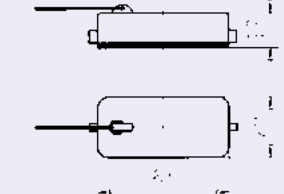
| General Characteristics                                      | Standard                        | Value                                  |
|--------------------------------------------------------------|---------------------------------|----------------------------------------|
| Protection class housing                                     |                                 | IP65                                   |
| Protection class spring cover<br>locked                      |                                 | IP65                                   |
| unlocked spring loaded                                       |                                 | IP54                                   |
| Locking system                                               | DIN EN 175 301-801 (DIN 43 652) | 1 central lever<br>1 lever<br>2 levers |
| Tightening torque<br>(for screws used at housings and hoods) |                                 | 1.0 Nm<br>recommendation: M4 screw     |
| Fire protection railway                                      | EN 45545                        | HL3 acc. R22/23                        |
| Climatical Characteristics                                   |                                 |                                        |
| Climatic category                                            | IEC 60068-1                     | 40 / 100 / 21                          |
| Temperature range                                            | IEC 60068-1                     | - 40 °C / + 125 °C                     |
| Upper temperature                                            | IEC 60512-11-9                  | + 100 °C                               |
| Lower temperature                                            | IEC 60512-11-10                 | - 40 °C                                |
| Mechanical Characteristics                                   |                                 |                                        |
| Mechanical operation                                         | IEC 60512-9-1                   | ≥ 500 mating cycles                    |
| Materials                                                    |                                 |                                        |
| Metal hosuing E6 - E48                                       | DIN EN 175 301-801 (DIN 43 652) | Aluminium die cast alloy               |
| Colour metal housing E6 - E48                                |                                 | grey, similar RAL 9006                 |
| Thermoplastic housing A3/4                                   |                                 | PC                                     |
| Colour thermoplastic housing A3/4                            |                                 | grey, similar RAL 9006                 |
| Metal hosuing A3/4                                           |                                 | Cu-alloy                               |
| Colour metal housing A 3/4                                   |                                 | grey, similar RAL 9006                 |
| Protective cover                                             |                                 | PA                                     |
| Rubber gasket                                                |                                 | NBR                                    |
| Locking lever                                                |                                 | steel / zinc coated                    |
| Plating metal housing                                        |                                 | powder coated                          |

| Description                                                  | M  | Part Number                                              | Drawing | Figure |
|--------------------------------------------------------------|----|----------------------------------------------------------|---------|--------|
| <b>Hoods</b>                                                 |    |                                                          |         |        |
| Hood<br>top entry                                            | 20 | C146 10R003 600 4<br>C146 10R003 601 4<br>(black design) |         |        |
| Hood<br>side entry                                           | 20 | C146 10R003 500 4                                        |         |        |
| <b>Housings</b>                                              |    |                                                          |         |        |
| Housing<br>bulkhead mounting<br>with gasket                  | -  | C146 10F003 000 4<br>C146 10F003 001 4<br>(black design) |         |        |
| Housing<br>bulkhead end mounting<br>with gasket              | -  | C146 10F003 004 4                                        |         |        |
| Housing<br>single side entry<br>with gland bushing           | 20 | C146 10N003 500 4                                        |         |        |
| Hood<br>cable to cable coupling                              | 20 | C146 10R003 804 4                                        |         |        |
| <b>Protective cover (only in connection with Pin insert)</b> |    |                                                          |         |        |
| Cover for housings                                           | -  | C146 10Z003 100 4                                        |         |        |

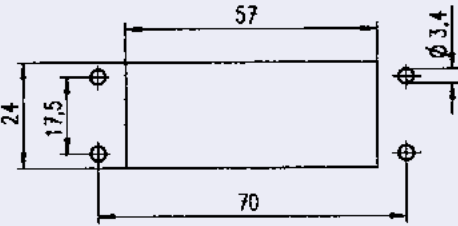
| Description                                                                               | M  | Part Number                            | Drawing | Figure |
|-------------------------------------------------------------------------------------------|----|----------------------------------------|---------|--------|
| <b>Hoods</b>                                                                              |    |                                        |         |        |
| Hood<br>top entry                                                                         | 20 | C146 30R003 600 4                      |         |        |
| Hood<br>side entry                                                                        | 20 | C146 30R003 500 4                      |         |        |
| <b>Housings</b>                                                                           |    |                                        |         |        |
| Housing<br>bulkhead mounting<br>with gasket                                               | -  | C146 30F003 000 4                      |         |        |
| Housing<br>bulkhead end mounting<br>- with gasket<br>- with foam rubber<br>sealing (2 mm) | -  | C146 30F003 004 4<br>C146 30F003 104 4 |         |        |
| Housing<br>single side entry<br>with gland bushing                                        | 20 | C146 30N003 500 4                      |         |        |
| Hood<br>cable to cable coupling                                                           | 20 | C146 30R003 804 4                      |         |        |
| <b>Protective cover (only in connection with Pin insert)</b>                              |    |                                        |         |        |
| Cover for housings                                                                        | -  | C146 30Z003 100 4                      |         |        |



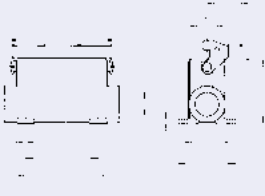
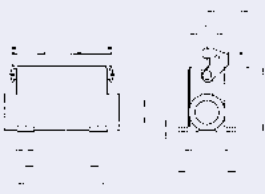
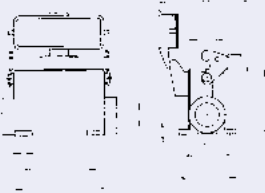
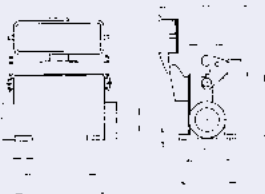
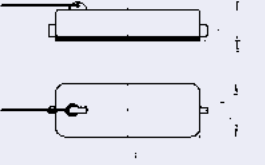
| Description                                                      | M  | Part Number       | Drawing                                                                              | Figure                                                                                |
|------------------------------------------------------------------|----|-------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                                                     |    |                   |                                                                                      |                                                                                       |
| Hood<br>top entry<br>low profile                                 | 20 | C146 21R010 650 4 |    |    |
|                                                                  | 25 | C146 21R010 600 4 |                                                                                      |                                                                                       |
| Hood<br>top entry<br>high profile                                | 20 | C146 21R015 650 2 |    |    |
|                                                                  | 25 | C146 21R015 600 2 |                                                                                      |                                                                                       |
| Hood<br>side entry<br>low profile                                | 20 | C146 21R010 550 4 |    |    |
|                                                                  | 25 | C146 21R010 500 4 |                                                                                      |                                                                                       |
| Hood<br>side entry<br>high profile                               | 20 | C146 21R015 550 2 |    |    |
|                                                                  | 25 | C146 21R015 500 2 |                                                                                      |                                                                                       |
| <b>Housings</b>                                                  |    |                   | <b>h</b>                                                                             |                                                                                       |
| Hood<br>coupling application<br>low profile                      | 20 | C146 21R010 854 4 |   |   |
|                                                                  | 25 | C146 21R010 804 4 |                                                                                      |                                                                                       |
| Hood<br>coupling application<br>high profile                     | 20 | C146 21R015 854 2 |   |   |
|                                                                  | 25 | C146 21R015 804 2 |                                                                                      |                                                                                       |
| Housing<br>bulkhead mounting<br>with gasket                      | -  | C146 10F015 000 2 |  |  |
| Housing<br>bulkhead mounting<br>with spring cover<br>with gasket | -  | C146 10F015 003 2 |  |  |

| Description                                       | M  | Part Number       | Drawing                                                                                                         | Figure                                                                                |
|---------------------------------------------------|----|-------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Housings                                          |    |                   |                                                                                                                 |                                                                                       |
| Housing<br>single side entry                      | 25 | C146 10N015 500 2 | <br>1 closed if single entry |    |
| Housing<br>double side entry                      | 25 | C146 10N015 600 2 |                              |    |
| Housing<br>with spring cover<br>single side entry | 25 | C146 10N015 806 2 | <br>1 closed if single entry |    |
| Housing<br>with spring cover<br>double side entry | 20 | C146 10N015 607 2 |                            |  |
|                                                   | 25 | C146 10N015 606 2 |                                                                                                                 |                                                                                       |
| Protective cover                                  |    |                   |                                                                                                                 |                                                                                       |
| Cover for housings                                | -  | C146 10Z015 100 2 |                            |  |

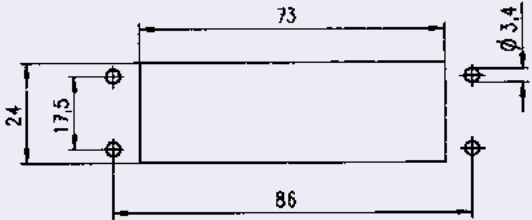
Panel cut out for bulkhead mounting



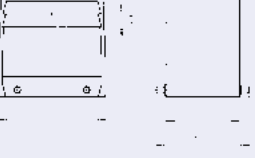
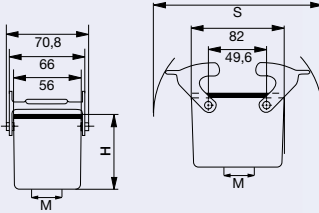
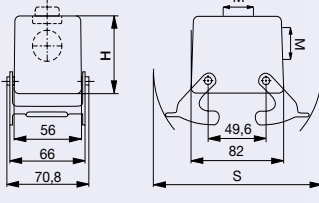
| Description                                                      | M  | Part Number       | Drawing  | Figure |
|------------------------------------------------------------------|----|-------------------|----------|--------|
| <b>Hoods</b>                                                     |    |                   |          |        |
| Hood<br>top entry<br>low profile                                 | 20 | C146 21R016 650 4 |          |        |
|                                                                  | 25 | C146 21R016 600 4 |          |        |
| Hood<br>top entry<br>high profile                                | 20 | C146 21R025 650 2 |          |        |
|                                                                  | 25 | C146 21R025 600 2 |          |        |
| Hood<br>side entry<br>low profile                                | 20 | C146 21R016 550 4 |          |        |
|                                                                  | 25 | C146 21R016 500 4 |          |        |
| Hood<br>side entry<br>high profile                               | 20 | C146 21R025 550 2 |          |        |
|                                                                  | 25 | C146 21R025 500 2 |          |        |
| <b>Housings</b>                                                  |    |                   | <b>h</b> |        |
| Hood<br>coupling application<br>low profile                      | 20 | C146 21R016 854 4 |          |        |
|                                                                  | 25 | C146 21R016 804 4 |          |        |
| Hood<br>coupling application<br>high profile                     | 20 | C146 21R025 854 2 |          |        |
|                                                                  | 25 | C146 21R025 804 2 |          |        |
| Housing<br>bulkhead mounting<br>with gasket                      | -  | C146 10F025 000 2 |          |        |
| Housing<br>bulkhead mounting<br>with spring cover<br>with gasket | -  | C146 10F025 003 2 |          |        |

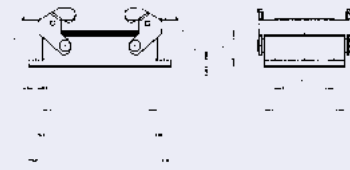
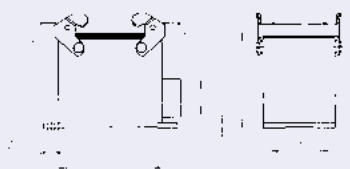
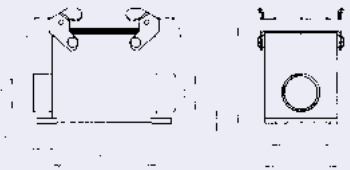
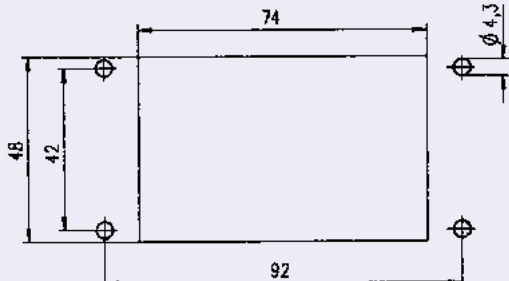
| Description                                       | M  | Part Number       | Drawing                                                                                                         | Figure                                                                                |
|---------------------------------------------------|----|-------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Housings                                          |    |                   |                                                                                                                 |                                                                                       |
| Housing<br>single side entry                      | 25 | C146 10N025 500 2 | <br>1 closed if single entry |    |
| Housing<br>double side entry                      | 20 | C146 10N025 601 2 |                              |    |
|                                                   | 25 | C146 10N025 600 2 |                                                                                                                 |                                                                                       |
| Housing<br>with spring cover<br>single side entry | 25 | C146 10N025 806 2 | <br>1 closed if single entry |    |
| Housing<br>with spring cover<br>double side entry | 20 | C146 10N025 607 2 |                            |  |
|                                                   | 25 | C146 10N025 606 2 |                                                                                                                 |                                                                                       |
| Protective cover                                  |    |                   |                                                                                                                 |                                                                                       |
| Cover for housings                                | -  | C146 10Z025 100 2 |                            |  |

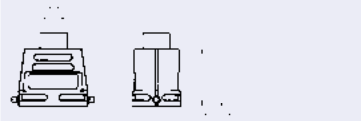
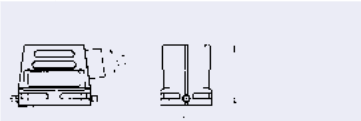
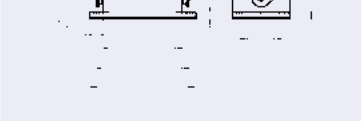
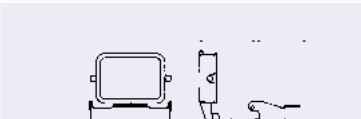
Panel cut out for bulkhead mounting

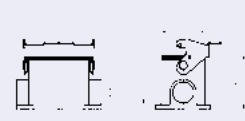
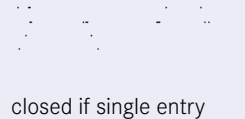
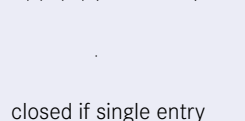
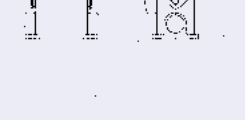
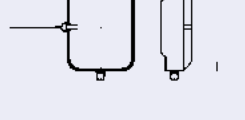




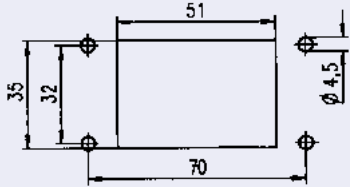
| Description                  | M  | Part Number       | Drawing                                                                             | Figure                                                                                |
|------------------------------|----|-------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                 |    |                   |                                                                                     |                                                                                       |
| Hood<br>top entry            | 25 | C146 21R032 650 4 |    |    |
|                              | 32 | C146 21R032 600 4 |                                                                                     |                                                                                       |
|                              | 40 | C146 21R032 601 4 |                                                                                     |                                                                                       |
| Hood<br>side entry           | 25 | C146 21R032 550 4 |    |    |
|                              | 32 | C146 21R032 500 4 |                                                                                     |                                                                                       |
|                              | 40 | C146 21R032 501 4 |                                                                                     |                                                                                       |
| Hood<br>coupling application | 25 | C146 21R032 852 4 |    |    |
|                              | 32 | C146 21R032 802 4 |                                                                                     |                                                                                       |
|                              | 40 | C146 21R032 803 4 |                                                                                     |                                                                                       |
| Hood<br>side entry           | 25 | C146 21R032 552 4 |  |  |
|                              | 32 | C146 21R032 502 4 |                                                                                     |                                                                                       |

| Description                                                                           | M  | Part Number       | Drawing                                                                             | Figure                                                                              |
|---------------------------------------------------------------------------------------|----|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Housings</b>                                                                       |    |                   |                                                                                     |                                                                                     |
| Housing<br>bulkhead mounting<br>with gasket                                           | -  | C146 10F032 000 4 |  |  |
| Housing<br>single side entry                                                          | 25 | C146 10N032 550 4 |  |  |
|                                                                                       | 32 | C146 10N032 500 4 |                                                                                     |                                                                                     |
| Housing<br>double side entry                                                          | 25 | C146 10N032 650 4 |  |  |
|                                                                                       | 32 | C146 10N032 600 4 |                                                                                     |                                                                                     |
| <b>Panel cut out for bulkhead mounting</b>                                            |    |                   |                                                                                     |                                                                                     |
|  |    |                   |                                                                                     |                                                                                     |

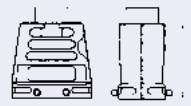
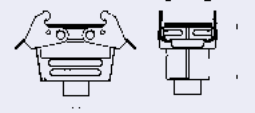
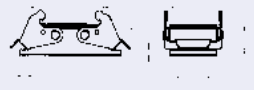
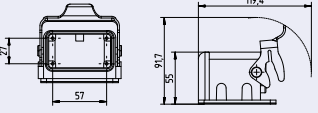
| Description                                                                       | M        | Part Number                            | Drawing                                                                              | Figure                                                                                |                                                                                      |
|-----------------------------------------------------------------------------------|----------|----------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Hoods                                                                             |          |                                        |                                                                                      |                                                                                       |                                                                                      |
| Hood<br>top entry<br>low profile                                                  | 16<br>20 | C146 21R006 656 1<br>C146 21R006 606 1 |    |    |                                                                                      |
| Hood<br>top entry<br>high profile                                                 | 25<br>32 | C146 21R006 656 8<br>C146 21R006 606 8 |    |                                                                                       |                                                                                      |
| Hood<br>side entry<br>low profile                                                 | 20<br>25 | C146 21R006 506 1<br>C146 21R006 507 1 |    |    |                                                                                      |
| Hood<br>side entry<br>high profile                                                | 25<br>32 | C146 21R006 556 8<br>C146 21R006 506 8 |    |                                                                                       |                                                                                      |
| Housings                                                                          |          |                                        | h                                                                                    |                                                                                       |                                                                                      |
| Hood<br>coupling application<br>low profile                                       | 20       | C146 21R006 804 1                      | 52                                                                                   |     |  |
| Hood<br>coupling application<br>high profile                                      | 25       | C146 21R006 854 8                      | 70                                                                                   |    |                                                                                      |
| Housing<br>bulkhead mounting<br>with gasket                                       | -        | C146 10F006 000 1                      |  |  |                                                                                      |
| Housing<br>bulkhead mounting<br>with thermoplastic<br>spring cover<br>with gasket | -        | C146 10F006 003 1                      |  |  |                                                                                      |
| Housing<br>bulkhead mounting<br>with metal spring cover<br>with gasket            | -        | C146 30F006 003 1                      |  |  |                                                                                      |

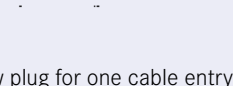
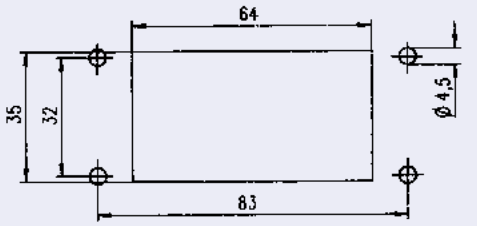
| Description                                                       | M        | Part Number                            | Drawing  | Figure                                                                                |                                                                                       |
|-------------------------------------------------------------------|----------|----------------------------------------|----------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Housings                                                          |          |                                        |          |                                                                                       |                                                                                       |
| Housing<br>single side entry<br>low profile                       | 20       | C146 10N006 803 1                      | 57       |    |    |
| Housing<br>single side entry<br>high profile                      | 32<br>25 | C146 10N006 802 2<br>C146 10N006 803 2 | 74<br>74 |    | 1 closed if single entry                                                              |
| Housing<br>double side entry<br>low profile                       | 20       | C146 10N006 603 1                      | 57       |    |    |
| Housing<br>double side entry<br>high profile                      | 25<br>32 | C146 10N006 603 2<br>C146 10N006 602 2 | 74<br>74 |    |                                                                                       |
| Housing<br>with spring cover<br>single side entry<br>low profile  | 20<br>25 | C146 10N006 807 1<br>C146 10N006 806 1 | 57<br>57 |    |    |
| Housing<br>with spring cover<br>single side entry<br>high profile | 25<br>32 | C146 10N006 807 2<br>C146 10N006 806 2 | 74<br>74 |    | 1 closed if single entry                                                              |
| Housing<br>with spring cover<br>double side entry<br>low profile  | 20       | C146 10N006 607 1                      | 57       |   |   |
| Housing<br>with spring cover<br>double side entry<br>high profile | 25<br>32 | C146 10N006 607 2<br>C146 10N006 606 2 | 74<br>74 |  |                                                                                       |
| Protective cover                                                  |          |                                        |          |                                                                                       |                                                                                       |
| Cover for housings                                                | -        | C146 10Z006 100 1                      |          |  |  |
| Cover for hoods                                                   | -        | C146 10Z006 200 1                      |          |  |  |

Panel cut out for bulkhead mounting





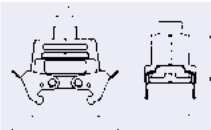
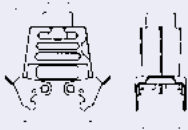
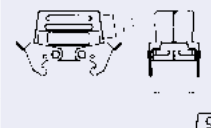
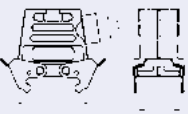
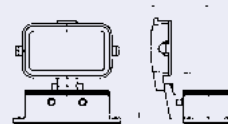
| Description                                  | M  | Part Number       | Drawing                                                                            | Figure                                                                                |
|----------------------------------------------|----|-------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Hoods                                        |    |                   |                                                                                    |                                                                                       |
| Hood<br>top entry<br>low profile             | 20 | C146 21R010 650 1 |   |    |
|                                              | 25 | C146 21R010 600 1 |                                                                                    |                                                                                       |
| Hood<br>top entry<br>high profile            | 25 | C146 21R010 650 8 |  |    |
|                                              | 32 | C146 21R010 600 8 |                                                                                    |                                                                                       |
| Hood<br>side entry<br>low profile            | 20 | C146 21R010 550 1 |   |    |
|                                              | 25 | C146 21R010 500 1 |                                                                                    |                                                                                       |
| Hood<br>side entry<br>high profile           | 25 | C146 21R010 550 8 |  |    |
|                                              | 32 | C146 21R010 500 8 |                                                                                    |                                                                                       |
| Housings                                     |    |                   | h                                                                                  |                                                                                       |
| Hood<br>coupling application<br>low profile  | 20 | C146 21R010 852 1 | 51                                                                                 |     |
|                                              | 25 | C146 21R010 802 1 | 51                                                                                 |                                                                                       |
|                                              |    |                   | 51                                                                                 |                                                                                       |
| Hood<br>coupling application<br>high profile | 25 | C146 21R010 852 8 | 70                                                                                 |   |
|                                              | 32 | C146 21R010 802 8 | 70                                                                                 |                                                                                       |
| Housing<br>bulkhead mounting<br>with gasket  | -  | C146 10F010 000 1 |                                                                                    |    |
|                                              |    |                   |                                                                                    |  |
| Right-angled housing<br>with gasket          | -  | C146 10F010 090 1 |                                                                                    |   |
|                                              |    |                   |                                                                                    |  |

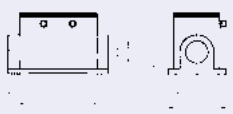
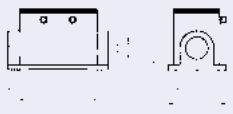
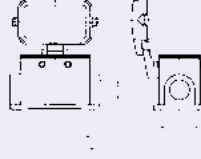
| Description                                                                          | M  | Part Number       | Drawing                        | Drawing                                                                             |                                                                                     |
|--------------------------------------------------------------------------------------|----|-------------------|--------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Housings                                                                             |    |                   | h                              |                                                                                     |                                                                                     |
| Housing<br>single side entry<br>low profile                                          | 20 | C146 10N010 501 1 | 57                             |  |  |
|                                                                                      | 25 | C146 10N010 500 1 | 57                             |                                                                                     |                                                                                     |
| Housing<br>single side entry<br>high profile                                         | 25 | C146 10N010 501 2 | 74                             |  |  |
|                                                                                      | 32 | C146 10N010 500 2 | 74                             |                                                                                     |                                                                                     |
|                                                                                      |    |                   | Screw plug for one cable entry |                                                                                     |                                                                                     |
| Housing<br>double side entry<br>low profile                                          | 20 | C146 10N010 601 1 | 57                             |  |  |
|                                                                                      |    |                   |                                |                                                                                     |                                                                                     |
| Housing<br>double side entry<br>high profile                                         | 25 | C146 10N010 601 2 | 74                             |  |  |
|                                                                                      | 32 | C146 10N010 600 2 | 74                             |                                                                                     |                                                                                     |
| Panel cut out for bulkhead mounting                                                  |    |                   |                                |                                                                                     |                                                                                     |
|  |    |                   |                                |                                                                                     |                                                                                     |

| Description                                                                       | M  | Part Number       | Drawing | Figure |  |
|-----------------------------------------------------------------------------------|----|-------------------|---------|--------|--|
| Hoods                                                                             |    |                   |         |        |  |
| Hood<br>top entry<br>low profile                                                  | 20 | C146 21R010 656 1 |         |        |  |
|                                                                                   | 25 | C146 21R010 606 1 |         |        |  |
|                                                                                   | 32 | C146 21R010 607 1 |         |        |  |
| Hood<br>top entry<br>high profile                                                 | 25 | C146 21R010 656 8 |         |        |  |
|                                                                                   | 32 | C146 21R010 606 8 |         |        |  |
|                                                                                   | 40 | C146 21R010 607 8 |         |        |  |
| Hood<br>side entry<br>low profile                                                 | 20 | C146 21R010 556 1 |         |        |  |
|                                                                                   | 25 | C146 21R010 506 1 |         |        |  |
| Hood<br>side entry<br>high profile                                                | 25 | C146 21R010 556 8 |         |        |  |
|                                                                                   | 32 | C146 21R010 506 8 |         |        |  |
| Housings                                                                          |    |                   | h       |        |  |
| Hood<br>coupling application<br>low profile                                       | 20 | C146 21R010 854 1 | 51      |        |  |
|                                                                                   | 25 | C146 21R010 804 1 | 51      |        |  |
|                                                                                   | 32 | C146 21R010 805 1 | 51      |        |  |
| Hood<br>coupling application<br>high profile                                      | 25 | C146 21R010 854 8 | 70      |        |  |
|                                                                                   | 32 | C146 21R010 804 8 | 70      |        |  |
|                                                                                   | 40 | C146 21R010 805 8 | 70      |        |  |
| Housing<br>bulkhead mounting<br>with gasket                                       | -  | C146 10F010 001 1 |         |        |  |
| Housing<br>bulkhead mounting<br>with thermoplastic<br>spring cover<br>with gasket | -  | C146 10F010 003 1 |         |        |  |
| Housing<br>bulkhead mounting<br>with metal spring cover<br>with gasket            | -  | C146 30F010 003 1 |         |        |  |

| Description                                                       | M  | Part Number       | Drawing | Figure                           |  |
|-------------------------------------------------------------------|----|-------------------|---------|----------------------------------|--|
| Housings                                                          |    |                   | h       |                                  |  |
| Housing<br>single side entry<br>low profile                       | 20 | C146 10N010 803 1 | 57      | <br><br>1 closed if single entry |  |
| Housing<br>single side entry<br>high profile                      | 25 | C146 10N010 803 2 | 74      |                                  |  |
|                                                                   | 32 | C146 10N010 802 2 | 74      |                                  |  |
| Housing<br>double side entry<br>low profile                       | 20 | C146 10N010 603 1 | 57      |                                  |  |
| Housing<br>double side entry<br>high profile                      | 25 | C146 10N010 603 2 | 74      |                                  |  |
| Housing<br>with spring cover<br>single side entry<br>low profile  | 20 | C146 10N010 807 1 | 57      | <br><br>1 closed if single entry |  |
| Housing<br>with spring cover<br>single side entry<br>high profile | 25 | C146 10N010 807 2 | 74      |                                  |  |
|                                                                   | 32 | C146 10N010 806 2 | 74      |                                  |  |
| Housing<br>with spring cover<br>double side entry<br>low profile  | 20 | C146 10N010 607 1 | 57      |                                  |  |
| Housing<br>with spring cover<br>double side entry<br>high profile | 25 | C146 10N010 607 2 | 74      |                                  |  |
|                                                                   | 32 | C146 10N010 606 2 | 74      |                                  |  |

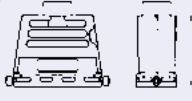
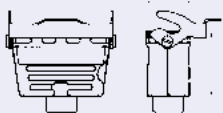
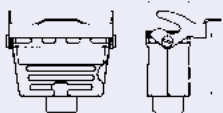
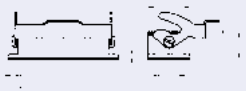
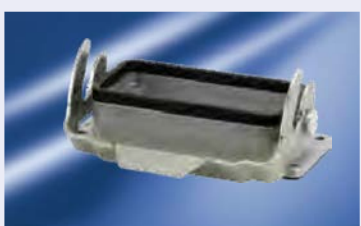
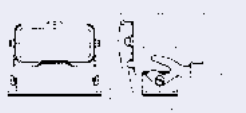
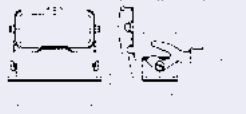


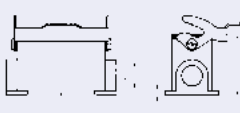
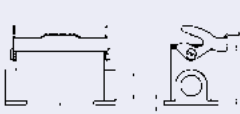
| Description                                 | M        | Part Number                            | Drawing                                                                            | Figure                                                                               |
|---------------------------------------------|----------|----------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Hoods</b>                                |          |                                        |                                                                                    |                                                                                      |
| Hood<br>top entry<br>low profile            | 20       | C146 21R010 652 1                      |   |   |
| Hood<br>top entry<br>high profile           | 25<br>32 | C146 21R010 652 8<br>C146 21R010 602 8 |  |                                                                                      |
| Hood<br>side entry<br>low profile           | 20       | C146 21R010 552 1                      |   |   |
| Hood<br>side entry<br>high profile          | 25<br>32 | C146 21R010 552 8<br>C146 21R010 502 8 |  |                                                                                      |
| <b>Housings</b>                             |          |                                        |                                                                                    |                                                                                      |
| Housing<br>with spring cover<br>with gasket | -        | C146 10F010 002 1                      |   |  |

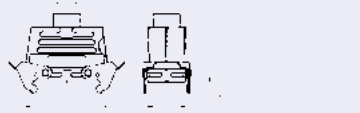
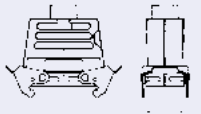
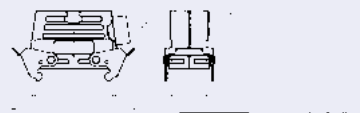
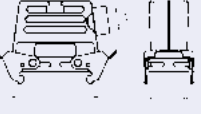
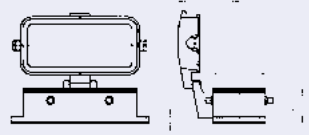
| Description                                                       | M  | Part Number       | Drawing  | Figure                                                                                                                                                                      |
|-------------------------------------------------------------------|----|-------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Housings</b>                                                   |    |                   | <b>h</b> |                                                                                                                                                                             |
| Housing<br>single side entry<br>low profile                       | 20 | C146 10N010 509 1 | 57       |       |
| Housing<br>single side entry<br>high profile                      | 32 | C146 10N010 508 2 | 74       |                                                                                                                                                                             |
|                                                                   |    |                   |          | 1 closed if single entry                                                                                                                                                    |
| Housing<br>double side entry<br>low profile                       | 20 | C146 10N010 609 1 | 57       |       |
| Housing<br>double side entry<br>high profile                      | 25 | C146 10N010 609 2 | 74       |                                                                                                                                                                             |
| Housing<br>with spring cover<br>single side entry<br>low profile  | 20 | C146 10N010 805 1 | 57       |       |
| Housing<br>with spring cover<br>single side entry<br>high profile | 32 | C146 10N010 804 2 | 74       |                                                                                                                                                                             |
|                                                                   |    |                   |          | 1 closed if single entry                                                                                                                                                    |
| Housing<br>with spring cover<br>double side entry<br>low profile  | 20 | C146 10N010 605 1 | 57       |   |
| Housing<br>with spring cover<br>double side entry<br>high profile | 32 | C146 10N010 604 2 | 74       |                                                                                                                                                                             |





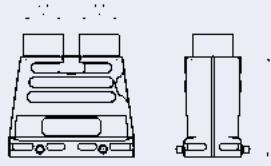
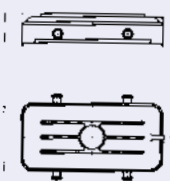
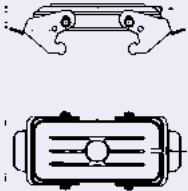
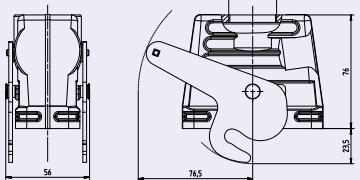
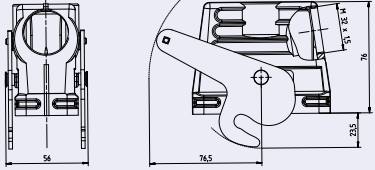
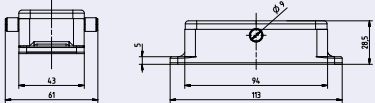
| Description                                                                       | M  | Part Number       | Drawing                                                                             | Figure                                                                                |
|-----------------------------------------------------------------------------------|----|-------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Hoods                                                                             |    |                   |                                                                                     |                                                                                       |
| Hood<br>top entry<br>low profile                                                  | 25 | C146 21R016 656 1 |    |    |
|                                                                                   | 32 | C146 21R016 606 1 |                                                                                     |                                                                                       |
| Hood<br>top entry<br>high profile                                                 | 32 | C146 21R016 606 8 |   |    |
|                                                                                   | 40 | C146 21R016 607 8 |                                                                                     |                                                                                       |
| Hood<br>side entry<br>low profile                                                 | 25 | C146 21R016 556 1 |    |    |
|                                                                                   | 32 | C146 21R016 506 1 |                                                                                     |                                                                                       |
| Hood<br>side entry<br>high profile                                                | 32 | C146 21R016 506 8 |   |    |
|                                                                                   | 40 | C146 21R016 507 8 |                                                                                     |                                                                                       |
| Housings                                                                          |    |                   | h                                                                                   |                                                                                       |
| Hood<br>coupling application<br>low profile                                       | 25 | C146 21R016 854 1 |    |   |
|                                                                                   | 32 | C146 21R016 804 1 |                                                                                     |                                                                                       |
| Hood<br>coupling application<br>high profile                                      | 32 | C146 21R016 804 8 |    |   |
|                                                                                   | 40 | C146 21R016 805 8 |                                                                                     |                                                                                       |
| Housing<br>bulkhead mounting<br>with gasket                                       | -  | C146 10F016 001 1 |  |  |
| Housing<br>bulkhead mounting<br>with thermoplastic<br>spring cover<br>with gasket | -  | C146 10F016 003 1 |  |  |
| Housing<br>bulkhead mounting<br>with metal spring cover<br>with gasket            | -  | C146 30F016 003 1 |  |  |

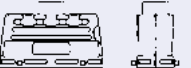
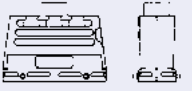
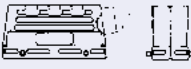
| Description                                                       | M        | Part Number                            | Drawing  | Figure                                                                                                                                                                     |
|-------------------------------------------------------------------|----------|----------------------------------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Housings                                                          |          |                                        | h        |                                                                                                                                                                            |
| Housing<br>single side entry<br>low profile                       | 25       | C146 10N016 802 1                      | 64       |      |
| Housing<br>single side entry<br>high profile                      | 32       | C146 10N016 802 2                      | 77       |                                                                                                                                                                            |
| Housing<br>double side entry<br>low profile                       | 25       | C146 10N016 602 1                      | 64       |      |
| Housing<br>double side entry<br>high profile                      | 25<br>32 | C146 10N016 603 2<br>C146 10N016 602 2 | 77<br>77 |                                                                                                                                                                            |
| Housing<br>with spring cover<br>single side entry<br>low profile  | 25       | C146 10N016 806 1                      | 64       |      |
| Housing<br>with spring cover<br>single side entry<br>high profile | 32       | C146 10N016 806 2                      | 77       |                                                                                                                                                                            |
| Housing<br>with spring cover<br>double side entry<br>low profile  | 25       | C146 10N016 606 1                      | 64       |   |
| Housing<br>with spring cover<br>double side entry<br>high profile | 25<br>32 | C146 10N016 607 2<br>C146 10N016 606 2 | 77<br>77 |                                                                                                                                                                            |

| Description                                                      | M        | Part Number                            | Drawing                                                                            | Figure                                                                               |
|------------------------------------------------------------------|----------|----------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Hoods</b>                                                     |          |                                        |                                                                                    |                                                                                      |
| Hood<br>top entry<br>low profile                                 | 25<br>32 | C146 21R016 652 1<br>C146 21R016 602 1 |  |   |
| Hood<br>top entry<br>high profile                                | 32<br>40 | C146 21R016 602 8<br>C146 21R016 603 8 |  |                                                                                      |
| Hood<br>side entry<br>low profile                                | 25<br>32 | C146 21R016 552 1<br>C146 21R016 502 1 |  |   |
| Hood<br>side entry<br>high profile                               | 32<br>40 | C146 21R016 502 8<br>C146 21R016 503 8 |  |                                                                                      |
| <b>Housings</b>                                                  |          |                                        |                                                                                    |                                                                                      |
| Housing<br>bulkhead mounting<br>with spring cover<br>with gasket | -        | C146 10F016 002 1                      |  |  |

| Description                                                       | M  | Part Number       | Drawing  | Figure                                                                                                                                                                      |
|-------------------------------------------------------------------|----|-------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Housings</b>                                                   |    |                   | <b>h</b> |                                                                                                                                                                             |
| Housing<br>single side entry<br>low profile                       | 25 | C146 10N016 508 1 | 64       |       |
| Housing<br>single side entry<br>high profile                      | 32 | C146 10N016 508 2 | 77       |                                                                                                                                                                             |
|                                                                   |    |                   |          | 1 closed if single entry                                                                                                                                                    |
| Housing<br>double side entry<br>low profile                       | 25 | C146 10N016 608 1 | 64       |       |
| Housing<br>double side entry<br>high profile                      | 32 | C146 10N016 608 2 | 77       |                                                                                                                                                                             |
| Housing<br>with spring cover<br>single side entry<br>low profile  | 25 | C146 10N016 804 1 | 64       |       |
| Housing<br>with spring cover<br>single side entry<br>high profile | 32 | C146 10N016 804 2 | 77       |                                                                                                                                                                             |
|                                                                   |    |                   |          | 1 closed if single entry                                                                                                                                                    |
| Housing<br>with spring cover<br>double side entry<br>low profile  | 25 | C146 10N016 604 1 | 64       |   |
| Housing<br>with spring cover<br>double side entry<br>high profile | 32 | C146 10N016 604 2 | 77       |                                                                                                                                                                             |

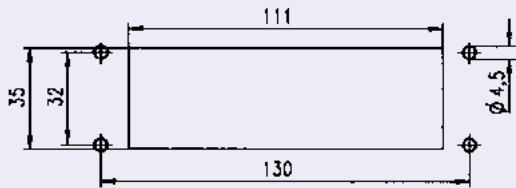


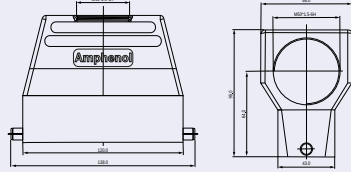
| Description                                                  | M        | Part Number                            | Drawing                                                                              | Figure                                                                                |
|--------------------------------------------------------------|----------|----------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                                                 |          |                                        |                                                                                      |                                                                                       |
| Hood<br>2 top entry<br>high profile                          | 25<br>32 | C146 10R016 910 8<br>C146 10R016 902 8 |     |    |
| <b>Protective cover (only in connection with Pin insert)</b> |          |                                        |                                                                                      |                                                                                       |
| Cover for housings                                           | -        | C146 10Z016 100 1                      |     |    |
| Cover for hoods                                              | -        | C146 10Z016 200 1                      |    |   |
| <b>Central lever / Hoods</b>                                 |          |                                        |                                                                                      |                                                                                       |
| Hood<br>top entry                                            | 32       | C146 36R016 602 8                      |  |  |
| Hood<br>side entry<br>high profile                           | 32       | C146 36R016 502 8                      |  |  |
| <b>Central lever / Housings</b>                              |          |                                        |                                                                                      |                                                                                       |
| Housing with<br>central lever<br>bulkhead mounting           | -        | C146 36F016 000 1                      |  |  |
| <b>Further special housings on request.</b>                  |          |                                        |                                                                                      |                                                                                       |

| Description                        | M              | Part Number                                                 | Drawing                                                                             | Figure                                                                              |
|------------------------------------|----------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Hoods</b>                       |                |                                                             |                                                                                     |                                                                                     |
| Hood<br>top entry<br>low profile   | 25<br>32<br>20 | C146 21R024 650 1<br>C146 21R024 600 1<br>C146 21R024 700 1 |  |  |
| Hood<br>top entry<br>high profile  | 32<br>40       | C146 21R024 600 8<br>C146 21R024 601 8                      |  |                                                                                     |
| Hood<br>side entry<br>low profile  | 25<br>32       | C146 21R024 550 1<br>C146 21R024 500 1                      |  |  |
| Hood<br>side entry<br>high profile | 32<br>40       | C146 21R024 500 8<br>C146 21R024 501 8                      |  |                                                                                     |
| Hood<br>top entry                  | 50             | on request                                                  |                                                                                     |  |
| Hood<br>side entry                 | 50             | on request                                                  |                                                                                     |                                                                                     |

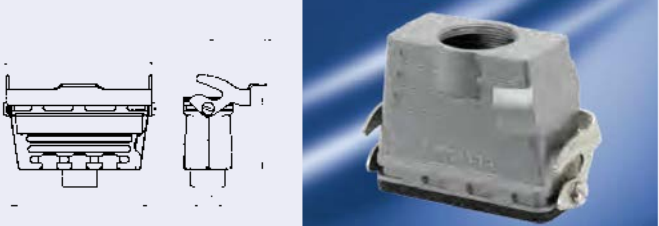
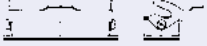
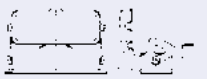
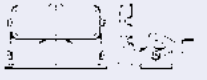
| Description                                                                     | M        | Part Number                            | Drawing                                                                            | Figure                                                                                |
|---------------------------------------------------------------------------------|----------|----------------------------------------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Housings</b>                                                                 |          |                                        |                                                                                    |                                                                                       |
| Hood<br>coupling application<br>low profile                                     | 25       | C146 21R024 852 1                      | h                                                                                  |    |
|                                                                                 | 32       | C146 21R024 802 1                      | 62                                                                                 |                                                                                       |
| Hood<br>coupling application<br>high profile                                    | 32       | C146 21R024 802 8                      | 76                                                                                 |    |
|                                                                                 | 40       | C146 21R024 803 8                      | 76                                                                                 |                                                                                       |
| Housing<br>-bulkhead mounting<br>with gasket<br>- foam rubber sealing<br>(2 mm) | -        | C146 10F024 000 1                      |  |    |
|                                                                                 | -        | C146 10F024 100 1                      |                                                                                    |                                                                                       |
| Housing<br>single side entry<br>low profile                                     | 25       | C146 10N024 500 1                      | 64                                                                                 |    |
| Housing<br>single side entry<br>high profile                                    | 32       | C146 10N024 500 2                      | 80                                                                                 |                                                                                       |
| Housing<br>double side entry<br>low profile                                     | 25       | C146 10N024 600 1                      | 64                                                                                 |  |
| Housing<br>double side entry<br>high profile                                    | 25<br>32 | C146 10N024 601 2<br>C146 10N024 600 2 | 80<br>80                                                                           |                                                                                       |

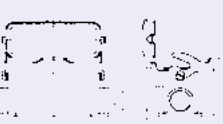
Panel cut out for bulkhead mounting

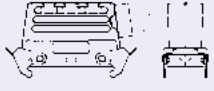
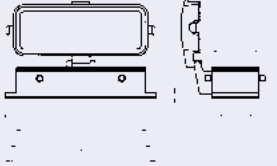


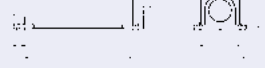
| Description                                     | M  | Part Number       | Drawing                                                                               | Figure                                                                                |
|-------------------------------------------------|----|-------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                                    |    |                   |                                                                                       |                                                                                       |
| Hood<br>top entry<br>low profile                | 25 | C146 21R024 656 1 |    |    |
|                                                 | 32 | C146 21R024 606 1 |                                                                                       |                                                                                       |
| Hood<br>top entry<br>high profile               | 32 | C146 21R024 606 8 |    |    |
|                                                 | 40 | C146 21R024 607 8 |                                                                                       |                                                                                       |
| Hood<br>side entry<br>low profile               | 25 | C146 21R024 556 1 |    |    |
|                                                 | 32 | C146 21R024 506 1 |                                                                                       |                                                                                       |
| Hood<br>side entry<br>high profile              | 32 | C146 21R024 506 8 |  |  |
|                                                 | 40 | C146 21R024 507 8 |                                                                                       |                                                                                       |
| Hood<br>top entry<br>side entry<br>high profile | 50 | C146 21R024 916 9 |    |    |
|                                                 | 40 |                   |                                                                                       |                                                                                       |



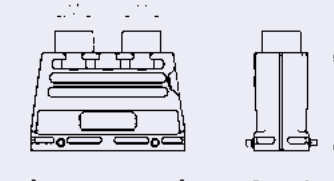
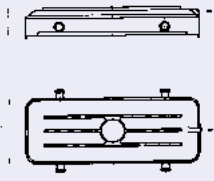
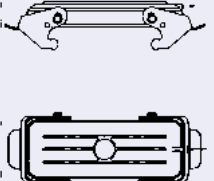
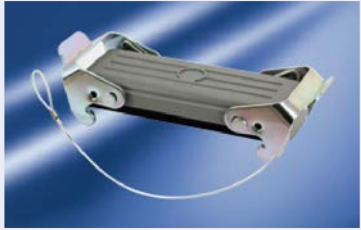
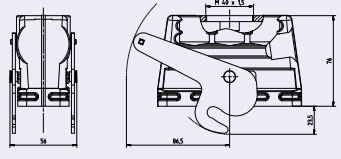
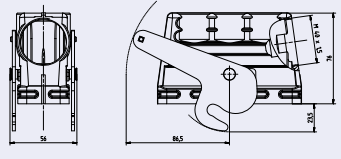
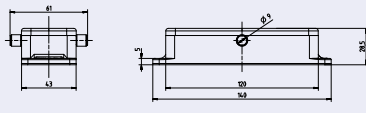
| Description                                                                       | M  | Part Number       | Drawing                                                                             | Figure                                                                                |
|-----------------------------------------------------------------------------------|----|-------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Housings</b>                                                                   |    |                   | <b>h</b>                                                                            |                                                                                       |
| Hood<br>coupling application<br>low profile                                       | 25 | C146 21R024 854 1 | 62                                                                                  |     |
|                                                                                   | 32 | C146 21R024 804 1 | 62                                                                                  |                                                                                       |
| Hood<br>coupling application<br>high profile                                      | 32 | C146 21R024 804 8 | 76                                                                                  |                                                                                       |
|                                                                                   | 40 | C146 21R024 805 8 | 76                                                                                  |                                                                                       |
| Housing<br>bulkhead mounting<br>with gasket                                       | -  | C146 10F024 001 1 |    |    |
| Housing<br>bulkhead mounting<br>with thermoplastic<br>spring cover<br>with gasket | -  | C146 10F024 003 1 |    |    |
| Housing<br>bulkhead mounting<br>with metal spring cover<br>with gasket            | -  | C146 30F024 003 1 |  |  |

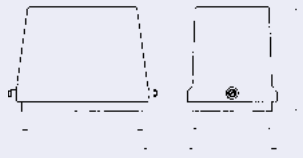
| Description                                                       | M        | Part Number                            | Drawing                  | Figure                                                                                |
|-------------------------------------------------------------------|----------|----------------------------------------|--------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                                                      |          |                                        | <b>h</b>                 |                                                                                       |
| Housing<br>single side entry<br>low profile                       | 25       | C146 10N024 802 1                      | 64                       |    |
| Housing<br>single side entry<br>high profile                      | 32       | C146 10N024 802 2                      | 80                       |                                                                                       |
|                                                                   |          |                                        | 1 closed if single entry |                                                                                       |
| Housing<br>double side entry<br>low profile                       | 25       | C146 10N024 602 1                      | 64                       |    |
| Housing<br>double side entry<br>high profile                      | 32       | C146 10N024 602 2                      | 80                       |                                                                                       |
| Housing<br>with spring cover<br>single side entry<br>low profile  | 25       | C146 10N024 806 1                      | 64                       |    |
| Housing<br>with spring cover<br>single side entry<br>high profile | 32       | C146 10N024 806 2                      | 80                       |                                                                                       |
|                                                                   |          |                                        | 1 closed if single entry |                                                                                       |
| Housing<br>with spring cover<br>double side entry<br>low profile  | 25       | C146 10N024 606 1                      | 64                       |  |
| Housing<br>with spring cover<br>double side entry<br>high profile | 25<br>32 | C146 10N024 607 2<br>C146 10N024 606 2 | 80<br>80                 |                                                                                       |

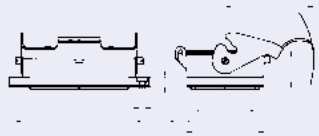
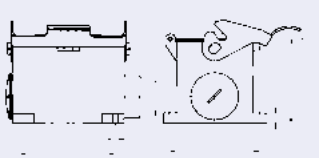
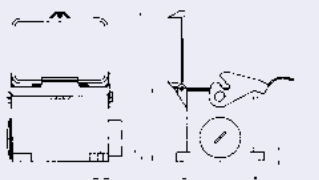
| Description                                                      | M        | Part Number                            | Drawing                                                                            | Figure                                                                               |
|------------------------------------------------------------------|----------|----------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Hoods</b>                                                     |          |                                        |                                                                                    |                                                                                      |
| Hood<br>top entry<br>low profile                                 | 25<br>32 | C146 21R024 652 1<br>C146 21R024 602 1 |  |   |
| Hood<br>top entry<br>high profile                                | 32<br>40 | C146 21R024 602 8<br>C146 21R024 603 8 |  |                                                                                      |
| Hood<br>side entry<br>low profile                                | 25<br>32 | C146 21R024 552 1<br>C146 21R024 502 1 |  |   |
| Hood<br>side entry<br>high profile                               | 32<br>40 | C146 21R024 502 8<br>C146 21R024 503 8 |  |                                                                                      |
| <b>Housings</b>                                                  |          |                                        |                                                                                    |                                                                                      |
| Housing<br>bulkhead mounting<br>with spring cover<br>with gasket | -        | C146 10F024 002 1                      |  |  |

| Description                                                       | M        | Part Number                            | Drawing  | Figure                                                                                                                                                                      |
|-------------------------------------------------------------------|----------|----------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Housings</b>                                                   |          |                                        | <b>h</b> |                                                                                                                                                                             |
| Housing<br>single side entry<br>low profile                       | 25       | C146 10N024 508 1                      | 64       |       |
| Housing<br>single side entry<br>high profile                      | 32       | C146 10N024 508 2                      | 80       | <br>1 closed if single entry                                                             |
| Housing<br>double side entry<br>low profile                       | 25       | C146 10N024 608 1                      | 64       |       |
| Housing<br>double side entry<br>high profile                      | 32       | C146 10N024 608 2                      | 80       |                                                                                          |
| Housing<br>with spring cover<br>single side entry<br>low profile  | 25       | C146 10N024 804 1                      | 64       |       |
| Housing<br>with spring cover<br>single side entry<br>high profile | 32       | C146 10N024 804 2                      | 80       | <br>1 closed if single entry                                                             |
| Housing<br>with spring cover<br>double side entry<br>low profile  | 25<br>25 | C146 10N024 604 1<br>C146 10N024 808 1 | 64<br>64 |   |
| Housing<br>with spring cover<br>double side entry<br>high profile | 25<br>32 | C146 10N024 605 2<br>C146 10N024 604 2 | 80<br>80 |                                                                                        |

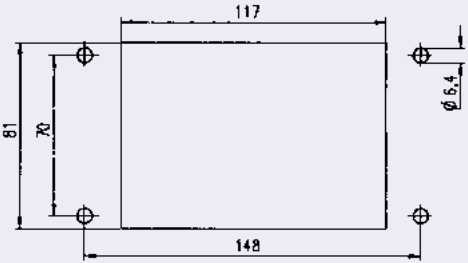


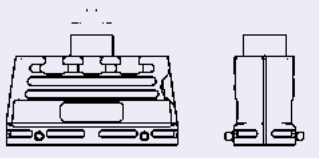
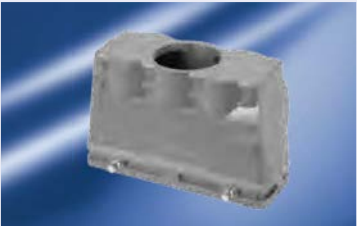
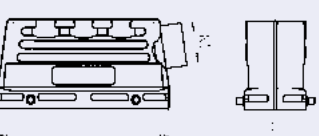
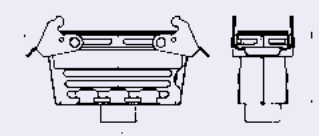
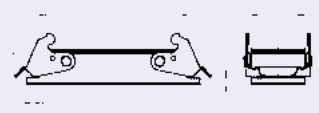
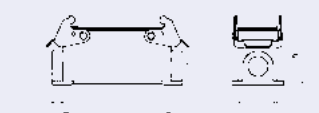
| Description                                                  | M        | Part Number                            | Drawing                                                                              | Figure                                                                                |
|--------------------------------------------------------------|----------|----------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                                                 |          |                                        |                                                                                      |                                                                                       |
| Hood<br>2 top entry<br>high profile                          | 32<br>40 | C146 10R024 903 8<br>C146 10R024 908 8 |     |    |
| <b>Protective cover (only in connection with Pin insert)</b> |          |                                        |                                                                                      |                                                                                       |
| Cover for housings                                           | -        | C146 10Z024 100 1                      |     |    |
| Cover for hoods                                              | -        | C146 10Z024 200 1                      |    |   |
| <b>Central lever / Hoods</b>                                 |          |                                        |                                                                                      |                                                                                       |
| Hood<br>top entry                                            | 40       | C146 36R024 601 8                      |  |  |
| Hood<br>side entry<br>high profile                           | 40       | C146 36R024 501 8                      |  |  |
| <b>Central lever / Housings</b>                              |          |                                        |                                                                                      |                                                                                       |
| Hood with central lever<br>and gasket                        | -        | C146 36F024 000 1                      |  |  |

| Description        | M        | Part Number                            | Drawing                                                                             | Figure                                                                              |
|--------------------|----------|----------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Hoods</b>       |          |                                        |                                                                                     |                                                                                     |
| Hood<br>top entry  | 40<br>50 | C146 21R048 607 1<br>C146 21R048 608 1 |  |  |
| Hood<br>side entry | 40<br>50 | C146 21R048 507 1<br>C146 21R048 508 1 |  |  |

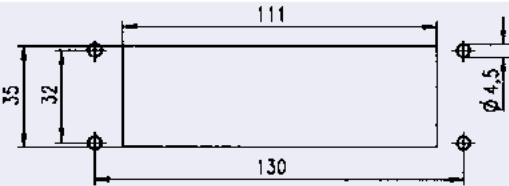
| Description                                             | M  | Part Number       | Drawing                                                                              | Figure                                                                               |
|---------------------------------------------------------|----|-------------------|--------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Hoods</b>                                            |    |                   |                                                                                      |                                                                                      |
| Housing bulkhead mounting with gasket                   | -  | C146 10F048 001 1 |    |   |
| Housing bulkhead mounting with spring cover with gasket | -  | C146 10F048 003 1 |    |   |
| Housing single side entry                               | 40 | C146 10N048 803 1 |    |   |
| Housing with spring cover                               | 40 | C146 10N048 807 1 |  |  |

Panel cut out for bulkhead mounting



| Description                           | M        | Part Number                            | Drawing                                                                                                           | Figure                                                                                |
|---------------------------------------|----------|----------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                          |          |                                        |                                                                                                                   |                                                                                       |
| Hood top entry low profile            | 25<br>32 | C146 10R024 650 3<br>C146 10R024 600 3 |                                |    |
| Hood side entry low profile           | 25<br>32 | C146 10R024 550 3<br>C146 10R024 500 3 |                                |    |
| <b>Housings</b>                       |          |                                        |                                                                                                                   |                                                                                       |
| Hood coupling application low profile | 25<br>32 | C146 10R024 852 3<br>C146 10R024 802 3 |                                |   |
| Housing bulkhead mounting with gasket | -        | C146 10F024 000 3                      |                              |  |
| Housing single side entry low profile | 25       | C146 10N024 500 3                      | <br>1 closed if single entry |  |
| Housing double side entry low profile | 25       | C146 10N024 600 3                      |                              |  |

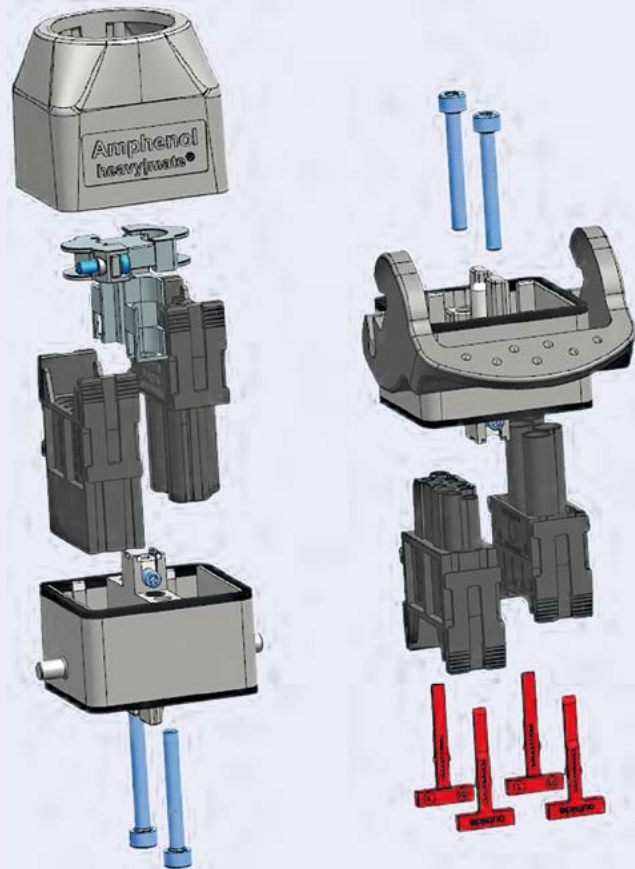
Panel cut out for bulkhead mounting

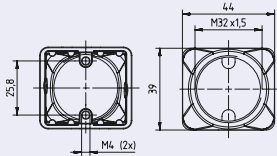
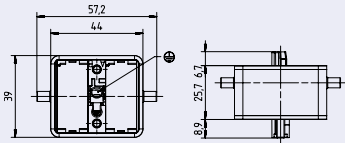
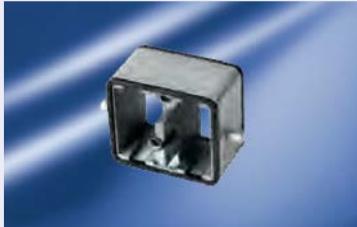
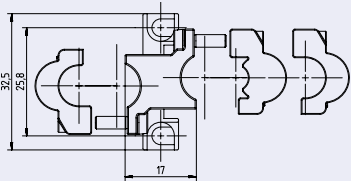
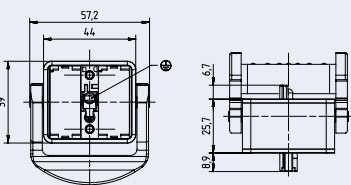
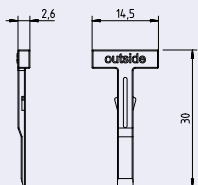




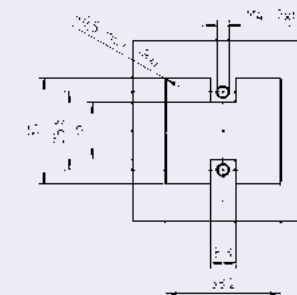
| General Characteristics    | Standard      | Value                                                                                              |
|----------------------------|---------------|----------------------------------------------------------------------------------------------------|
| Entry                      |               | M32 top entry                                                                                      |
| Protection class housing   |               | IP65                                                                                               |
| Number of modules          |               | 2                                                                                                  |
| Number of contacts         |               | up to 2 x 17 +  |
| Wire Gauge                 |               | 1.0 – 6 mm² (AWG 18 - 10)                                                                          |
| Tightening torque          |               | Mounting screw<br>Housing: 3.2 Nm<br>Hood and carrier hood: 5 Nm<br>Clamping screw: 1.2 Nm         |
| Locking system             |               | locking levers                                                                                     |
| Climatical Characteristics |               |                                                                                                    |
| Climatic category          |               | 40 / 100 / 21                                                                                      |
| Upper temperature          |               | + 100 °C                                                                                           |
| Lower temperature          |               | - 40 °C                                                                                            |
| Mechanical Characteristics |               |                                                                                                    |
| Mechanical operation       | IEC 60512-9-1 | ≥ 500 mating cycles                                                                                |
| Materials                  |               |                                                                                                    |
| Housings                   |               | Zinc die cast alloy                                                                                |
| Colour housings            |               | grey                                                                                               |
| Rubber gasket              |               | HNBR                                                                                               |
| Surface                    |               | nickel plated                                                                                      |

## Schematic construction



| Description                                         | M  | Part Number        | Drawing                                                                               | Figure                                                                                |
|-----------------------------------------------------|----|--------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                                        |    |                    |                                                                                       |                                                                                       |
| Hood                                                | 32 | C146 21R002 600 15 |    |    |
| Carrier hood                                        | -  | C146 21R002 000 15 |    |    |
| Shielding frame                                     | -  | C146 G05 003 G15   |    |    |
| <b>Housings</b>                                     |    |                    |                                                                                       |                                                                                       |
| Housing<br>bulkhead mounting<br>incl. 2 safety pins | -  | C146 10F002 000 15 |  |  |
| <b>Accessories</b>                                  |    |                    |                                                                                       |                                                                                       |
| Safety pin<br>(10 Pieces)                           | -  | VN09 146 0013 X    |  |  |

**Panel cut out for bulkhead mounting**



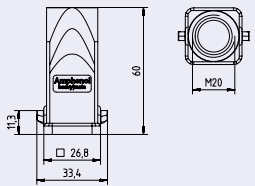
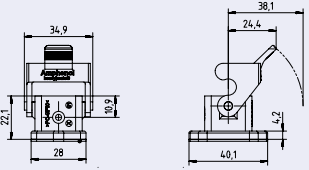
# heavy | mate<sup>®</sup> Housings

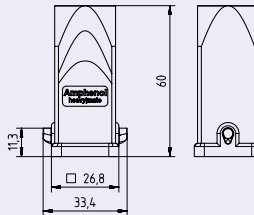
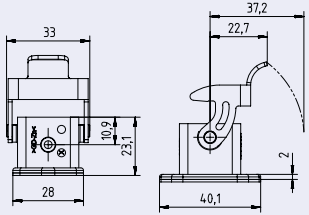
- Housings in IP67

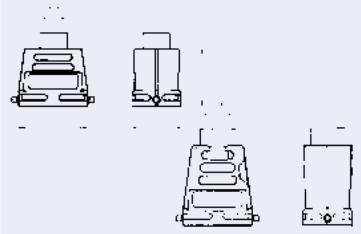
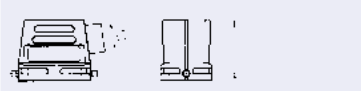
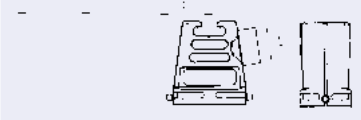
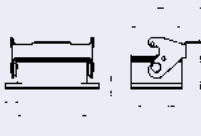
## heavy | mate<sup>®</sup> Housings IP67 Characteristics

| General Characteristics                                      | Standard                        | Value                            |
|--------------------------------------------------------------|---------------------------------|----------------------------------|
| Protection class housing                                     |                                 | IP67                             |
| Locking system                                               | DIN EN 175 301-801 (DIN 43 652) | 2 locking levers                 |
| Tightening torque<br>(for screws used at housings and hoods) |                                 | 1 Nm<br>recommendation: M4 screw |
| Climatical Characteristics                                   |                                 |                                  |
| Climatic category                                            | IEC 60068-1                     | 40 / 100 / 21                    |
| Upper temperature                                            | IEC 60512-11-9                  | + 100 °C                         |
| Lower temperature                                            | IEC 60512-11-10                 | - 40 °C                          |
| Mechanical Characteristics                                   |                                 |                                  |
| Mechanical operation                                         | IEC 60512-9-1                   | ≥ 500 mating cycles              |
| Materials                                                    |                                 |                                  |
| Metal housings E6 - E24                                      | DIN EN 175 301-801 (DIN 43 652) | Aluminium die cast alloy         |
| Colour metal housing E6 - E24                                |                                 | grey - similar RAL 9006          |
| Thermoplastic housings A3/4                                  |                                 | PC                               |
| Colour thermoplastic housings A3/4                           |                                 | grey - similar RAL 7032/9005     |
| Metal housing A3/4                                           |                                 | Zinc die cast alloy              |
| Colour metal housing A3/4                                    |                                 | grey - similar RAL 9006          |
| Rubber gasket                                                |                                 | CR                               |
| Locking lever                                                |                                 | steel / zinc coated              |
| Surface                                                      |                                 | powder coating                   |

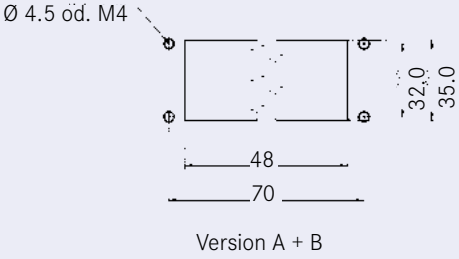


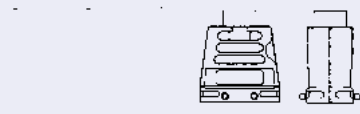
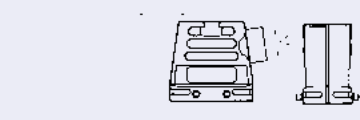
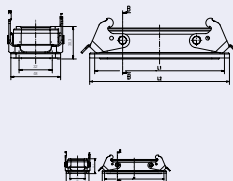
| Description                                 | M        | Part Number                                              | Drawing                                                                           | Figure                                                                              |
|---------------------------------------------|----------|----------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Hoods</b>                                |          |                                                          |                                                                                   |                                                                                     |
| Hood<br>top entry                           | 20<br>20 | C146 10R003 600 4<br>C146 10R003 601 4<br>(black design) |  |  |
| <b>Housings</b>                             |          |                                                          |                                                                                   |                                                                                     |
| Housing<br>bulkhead mounting<br>with gasket | -<br>-   | C146 10F003 000 4<br>C146 10F003 001 4<br>(black design) |  |  |

| Description                                 | M  | Part number       | Drawing                                                                             | Figure                                                                              |
|---------------------------------------------|----|-------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Hoods</b>                                |    |                   |                                                                                     |                                                                                     |
| Hood<br>top entry                           | 20 | C146 30R003 600 4 |  |  |
| <b>Housings</b>                             |    |                   |                                                                                     |                                                                                     |
| Housing<br>bulkhead mounting<br>with gasket | -  | C146 30F003 000 4 |  |  |

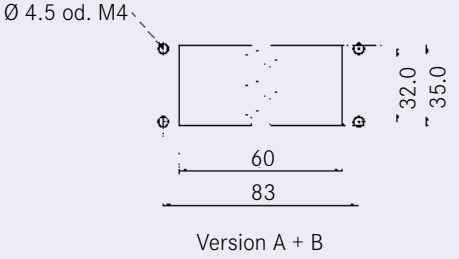
| Description                        | M        | Part Number                            | Drawing                                                                            |    | Figure                                                                                                                                                                     |
|------------------------------------|----------|----------------------------------------|------------------------------------------------------------------------------------|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hoods                              |          |                                        |                                                                                    |    |                                                                                                                                                                            |
| Hood<br>top entry<br>low profile   | 16<br>20 | C146 21R006 656 1<br>C146 21R006 606 1 |  |    |                                                                                         |
| Hood<br>top entry<br>high profile  | 25<br>32 | C146 21R006 656 8<br>C146 21R006 606 8 |  |    |                                                                                                                                                                            |
| Hood<br>side entry<br>low profile  | 20<br>25 | C146 21R006 506 1<br>C146 21R006 507 1 |  |    |                                                                                         |
| Hood<br>side entry<br>high profile | 25<br>32 | C146 21R006 556 8<br>C146 21R006 506 8 |  |    |                                                                                                                                                                            |
| Housings                           |          |                                        | L1                                                                                 | L2 |                                                                                                                                                                            |
| Housing<br>bulkhead mounting       | -        | C146 67F006 000 8                      | 70                                                                                 | 80 | <br> |

Panel cut out for bulkhead mounting

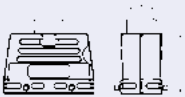
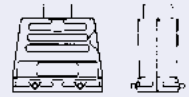
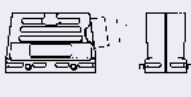
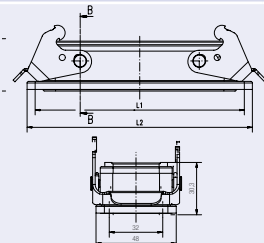
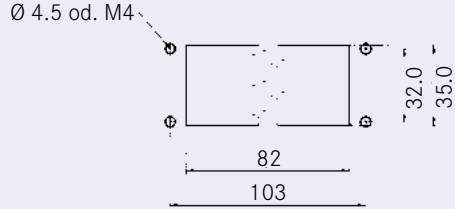


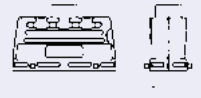
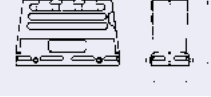
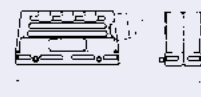
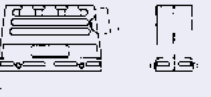
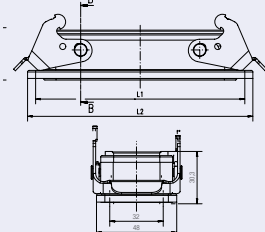
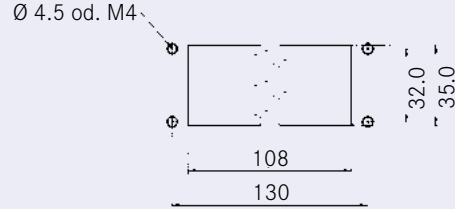
| Description                        | M        | Part Number                            | Drawing                                                                             |    | Figure                                                                                                                                                                      |
|------------------------------------|----------|----------------------------------------|-------------------------------------------------------------------------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hoods                              |          |                                        |                                                                                     |    |                                                                                                                                                                             |
| Hood<br>top entry<br>low profile   | 16<br>20 | C146 21R010 650 1<br>C146 21R010 600 1 |  |    |                                                                                          |
| Hood<br>top entry<br>high profile  | 25<br>30 | C146 21R010 650 8<br>C146 21R010 600 8 |  |    |                                                                                                                                                                             |
| Hood<br>side entry<br>low profile  | 20<br>25 | C146 67R010 550 1<br>C146 21R010 500 1 |  |    |                                                                                          |
| Hood<br>side entry<br>high profile | 25<br>32 | C146 21R010 550 8<br>C146 21R010 500 8 |  |    |                                                                                                                                                                             |
| Housings                           |          |                                        | L1                                                                                  | L2 |                                                                                                                                                                             |
| Housing<br>bulkhead mounting       |          | C146 67F010 000 8                      | 83                                                                                  | 93 | <br> |

Panel cut out for bulkhead mounting





| Description                                                                         | M                 | Part Number                            | Drawing                                                                            |     | Figure                                                                              |                                                                                      |
|-------------------------------------------------------------------------------------|-------------------|----------------------------------------|------------------------------------------------------------------------------------|-----|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Hoods                                                                               |                   |                                        |                                                                                    |     |                                                                                     |                                                                                      |
| Hood<br>top entry<br>low profile                                                    | 25<br>32          | C146 21R016 650 1<br>C146 21R016 600 1 |   |     |  |                                                                                      |
| Hood<br>top entry<br>high profile                                                   | 32<br>40          | C146 21R016 600 8<br>C146 21R016 601 8 |  |     |  |                                                                                      |
| Hood<br>side entry<br>low profile                                                   | 25<br>32          | C146 21R016 550 1<br>C146 21R016 500 1 |   |     |  |                                                                                      |
| Hood<br>side entry<br>high profile                                                  | 32<br>40          | C146 21R016 500 8<br>C146 21R016 501 8 |  |     |  |                                                                                      |
| Housings                                                                            |                   |                                        | L1                                                                                 | L2  |                                                                                     |                                                                                      |
| Housing<br>bulkhead mounting                                                        | C146 21F016 000 8 |                                        | 103                                                                                | 113 |  |  |
| Panel cut out for bulkhead mounting                                                 |                   |                                        |                                                                                    |     |                                                                                     |                                                                                      |
|  |                   |                                        |                                                                                    |     |                                                                                     |                                                                                      |
| Version A + B                                                                       |                   |                                        |                                                                                    |     |                                                                                     |                                                                                      |

| Description                                                                                                | M                 | Part Number       | Drawing                                                                             |     | Figure                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------------------------------------------------------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hoods                                                                                                      |                   |                   |                                                                                     |     |                                                                                                                                                                           |
| Hood<br>top entry<br>low profile                                                                           | 25                | C146 21R024 650 1 |  |     |                                                                                        |
|                                                                                                            | 32                | C146 21R024 600 1 |                                                                                     |     |                                                                                                                                                                           |
|                                                                                                            | 20                | C146 21R024 700 1 |                                                                                     |     |                                                                                                                                                                           |
| Hood<br>top entry<br>high profile                                                                          | 32                | C146 21R024 600 8 |  |     |                                                                                        |
|                                                                                                            | 40                | C146 21R024 601 8 |                                                                                     |     |                                                                                                                                                                           |
| Hood<br>side entry<br>low profile                                                                          | 25                | C146 21R024 550 1 |  |     |                                                                                        |
|                                                                                                            | 32                | C146 21R024 500 1 |                                                                                     |     |                                                                                                                                                                           |
| Hood<br>side entry<br>high profile                                                                         | 32                | C146 21R024 500 8 |  |     |                                                                                        |
|                                                                                                            | 40                | C146 21R024 501 8 |                                                                                     |     |                                                                                                                                                                           |
| Housings                                                                                                   |                   |                   | L1                                                                                  | L2  |                                                                                                                                                                           |
| Housing<br>bulkhead mounting                                                                               | C146 67F024 000 8 |                   | 130                                                                                 | 140 |   |
| Panel cut out for bulkhead mounting                                                                        |                   |                   |                                                                                     |     |                                                                                                                                                                           |
|  <p>Version A + B</p> |                   |                   |                                                                                     |     |                                                                                                                                                                           |





# heavy | mate<sup>®</sup> Housings

- Housings IP68 / 69K

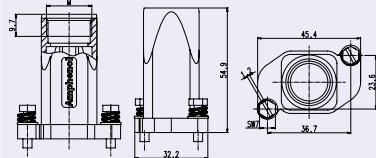
## heavy | mate<sup>®</sup> Housings IP68 / IP69K Characteristics

| General Characteristics                                      | Standard        | Value                            |
|--------------------------------------------------------------|-----------------|----------------------------------|
| Protection class housing                                     |                 | IP68 / IP69K                     |
| Locking system                                               |                 | 2 x screw M4 / M6                |
| Tightening torques for locking screws                        |                 | 4.0 Nm                           |
| Tightening torque<br>(for screws used at housings and hoods) |                 | 40 Nm<br>recommendation: M4 / M6 |
| Fire protection railway                                      | EN 45545        | HL3 acc. R22/23                  |
| Climatical Characteristics                                   |                 |                                  |
| Climatic category                                            | IEC 60068-1     | 40 / 125 / 21                    |
| Temperature range                                            | IEC 60068-1     | - 40 °C / + 125 °C               |
| Upper temperature                                            | IEC 60512-11-9  | + 125 °C                         |
| Lower temperature                                            | IEC 60512-11-10 | - 40 °C                          |
| Mechanical Characteristics                                   |                 |                                  |
| Mechanical operation                                         | IEC 60512-9-1   | ≥ 500 mating cycles              |
| Materials                                                    |                 |                                  |
| Housings                                                     |                 | Aluminium die cast alloy         |
| Colour housings                                              |                 | black – similar to RAL 9005      |
| Rubber gasket                                                |                 | Silicon                          |
| Locking lever                                                |                 | stainless steel                  |
| Surface                                                      |                 | powder coating                   |



## Brief information

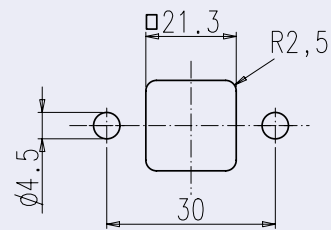
Please remove the sealing on the socket insert before assembling the insert to the IP68 / 69K housings size A3/4.

| Description  | M  | Part Number       | Drawing                                                                            | Figure                                                                              |
|--------------|----|-------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Hoods</b> |    |                   |                                                                                    |                                                                                     |
| Hood         | 20 | C146 68R003 600 4 |  |  |
| top entry    | 25 | C146 68R003 601 4 |                                                                                    |                                                                                     |

## Housings

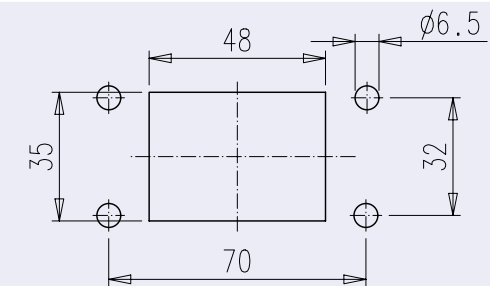
|                                      |                          |                                                                                    |                                                                                     |
|--------------------------------------|--------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <p>Housing<br/>bulkhead mounting</p> | <p>C146 68F003 000 4</p> |  |  |
|--------------------------------------|--------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|

### Panel cut out for bulkhead mounting



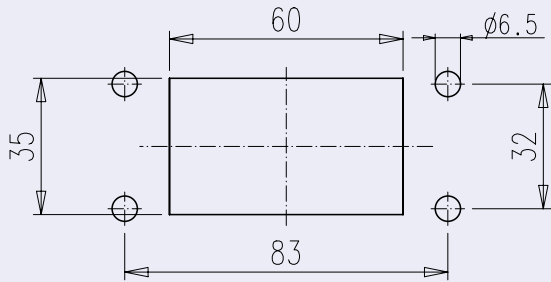
| Description                                | M              | Part Number                                                 | Drawing | Figure |
|--------------------------------------------|----------------|-------------------------------------------------------------|---------|--------|
| <b>Hoods</b>                               |                |                                                             |         |        |
| Hood<br>top entry                          | 32<br>40<br>25 | C146 68R006 600 8<br>C146 68R006 601 8<br>C146 68R006 650 8 |         |        |
| Hood<br>side entry                         | 32<br>40<br>25 | C146 68R006 500 8<br>C146 68R006 501 8<br>C146 68R006 550 8 |         |        |
| <b>Housings</b>                            |                |                                                             |         |        |
| Housing<br>bulkhead mounting               | -              | C146 68F006 001 1                                           |         |        |
| Housing<br>bulkhead mounting<br>easy mount | -              | C146 68F006 011 1                                           |         |        |
| Housing                                    | 40             | C146 68N006 500 2                                           |         |        |
| <b>Protective cover</b>                    |                |                                                             |         |        |
| Protective cover for<br>housings           | -              | C146 68Z006 100 1                                           |         |        |

**Panel cut out for bulkhead mounting**



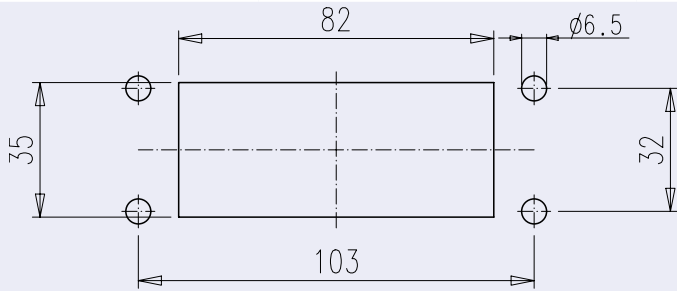
| Description                                | M              | Part Number                                                 | Drawing | Figure |
|--------------------------------------------|----------------|-------------------------------------------------------------|---------|--------|
| <b>Hoods</b>                               |                |                                                             |         |        |
| Hood<br>top entry                          | 32<br>40<br>25 | C146 68R010 600 8<br>C146 68R010 601 8<br>C146 68R010 650 8 |         |        |
| Hood<br>side entry                         | 32<br>40<br>25 | C146 68R010 500 8<br>C146 68R010 501 8<br>C146 68R010 550 8 |         |        |
| <b>Housings</b>                            |                |                                                             |         |        |
| Housing<br>bulkhead mounting               | -              | C146 68F010 001 1                                           |         |        |
| Housing<br>bulkhead mounting<br>easy mount | -              | C146 68F010 011 1                                           |         |        |
| Housing                                    | 32             | C146 68N010 500 2                                           |         |        |
| <b>Protective cover</b>                    |                |                                                             |         |        |
| Protective cover for<br>housings           | -              | C146 68Z010 100 1                                           |         |        |

Panel cut out for bulkhead mounting



| Description                                | M              | Part Number                                                 | Drawing | Figure |
|--------------------------------------------|----------------|-------------------------------------------------------------|---------|--------|
| <b>Hoods</b>                               |                |                                                             |         |        |
| Hood<br>top entry                          | 32<br>40<br>25 | C146 68R016 600 8<br>C146 68R016 601 8<br>C146 68R016 650 8 |         |        |
| Hood<br>side entry                         | 32<br>40<br>25 | C146 68R016 500 8<br>C146 68R016 501 8<br>C146 68R016 550 8 |         |        |
| <b>Housings</b>                            |                |                                                             |         |        |
| Housing<br>bulkhead mounting               | -              | C146 68F016 001 1                                           |         |        |
| Housing<br>bulkhead mounting<br>easy mount | -              | C 146 68F016 011 1                                          |         |        |
| Housing                                    | 40             | C146 68N016 501 2                                           |         |        |
| <b>Protective cover</b>                    |                |                                                             |         |        |
| Protective cover for<br>housings           | -              | C146 68Z016 100 1                                           |         |        |

Panel cut out for bulkhead mounting





| Description                                | M              | Part Number                                                 | Drawing | Figure |
|--------------------------------------------|----------------|-------------------------------------------------------------|---------|--------|
| Hoods                                      |                |                                                             |         |        |
| Hood<br>top entry                          | 32<br>40<br>25 | C146 68R024 600 8<br>C146 68R024 601 8<br>C146 68R024 650 8 |         |        |
| Hood<br>side entry                         | 32<br>40<br>25 | C146 68R024 500 8<br>C146 68R024 501 8<br>C146 68R024 550 8 |         |        |
| Housings                                   |                |                                                             |         |        |
| Housing<br>bulkhead mounting               | -              | C146 68F024 001 1                                           |         |        |
| Housing<br>bulkhead mounting<br>easy mount | -              | C146 68F024 011 1                                           |         |        |
| Housing                                    | 40             | C146 68N024 501 2                                           |         |        |
| Protective cover                           |                |                                                             |         |        |
| Protective cover for<br>housing            | -              | C146 68Z024 100 1                                           |         |        |
| Panel cut out for bulkhead mounting        |                |                                                             |         |        |
|                                            |                |                                                             |         |        |

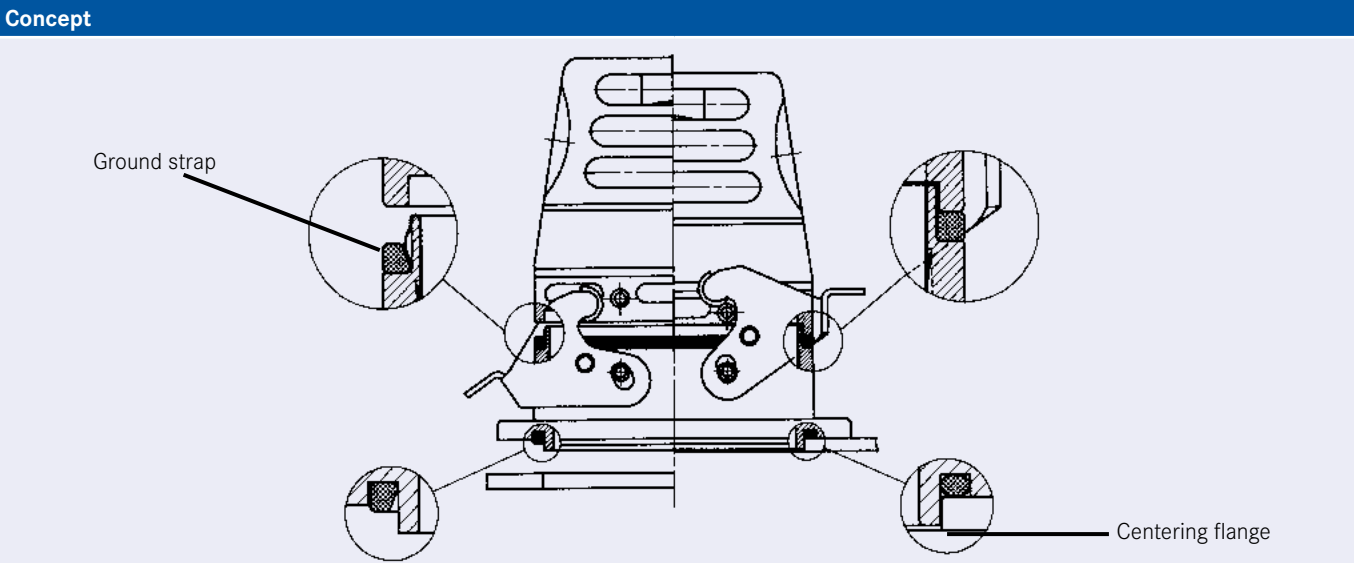


# heavy | mate<sup>®</sup> Housings

• EMC-Housings

- General information
- conductive surface
  - standard locking levers
  - same housing dimensions like standard housings
  - two housing sizes

- with or without ground strap
  - high attenuation
  - protection class IP65
  - mating cycles > 500
- 



| Range of housings in two housing sizes            |                                                |                                                 |
|---------------------------------------------------|------------------------------------------------|-------------------------------------------------|
| Version A<br>Standard flange without ground strap | Version B<br>Standard flange with ground strap | Version C<br>Centering flange with ground strap |
|                                                   |                                                |                                                 |

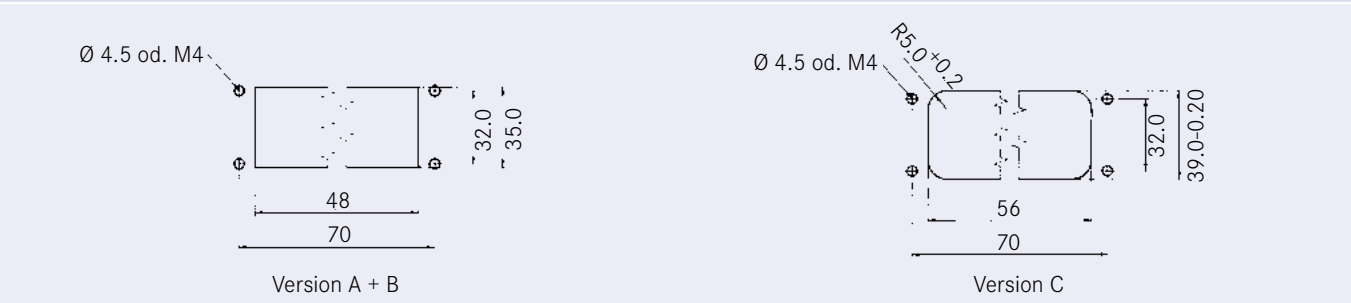
| General Characteristics    | Standard        | Value                      |
|----------------------------|-----------------|----------------------------|
| Protection class housing   |                 | IP65                       |
| Locking system             |                 | 2 locking levers           |
| Climatical Characteristics |                 |                            |
| Climatic category          | IEC 60068-1     | 40 / 100 / 21              |
| Upper temperature          | IEC 60512-11-9  | + 100 °C                   |
| Lower temperature          | IEC 60512-11-10 | - 40 °C                    |
| Mechanical Characteristics |                 |                            |
| Mechanical operation       | IEC 60512-9-1   | ≥ 500 mating cycles        |
| Materials                  |                 |                            |
| Housings                   |                 | Aluminium die cast alloy   |
| Colour housings            |                 | grey – similar to RAL 9006 |
| Rubber gasket              |                 | CR                         |
| Locking lever              |                 | steel / zinc coated        |
| Surface                    |                 | conducting special surface |



| Description                                 | M     | Part Number       | Drawing | Figure |
|---------------------------------------------|-------|-------------------|---------|--------|
| <b>Hoods</b>                                |       |                   |         |        |
| Hood top entry                              | PG 11 | C146 11R003 600 4 |         |        |
| Hood side entry                             | 20    | C146 11R003 500 4 |         |        |
| <b>Housings</b>                             |       |                   |         |        |
| Hood cable to cable coupling                | 20    | C146 11R003 804 4 |         |        |
| Housing bulkhead mounting                   |       | C146 11F003 000 4 |         |        |
| Housing bulkhead mounting with spring cover |       | C146 11F003 003 4 |         |        |
| Housing                                     |       | C146 11N003 500 4 |         |        |

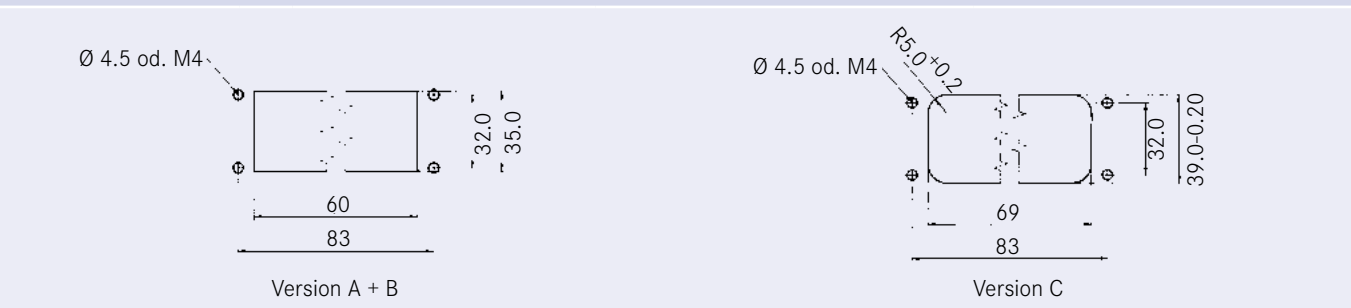
| Description                                                              | M              | Part Number                                                 | Drawing | Figure |
|--------------------------------------------------------------------------|----------------|-------------------------------------------------------------|---------|--------|
| <b>Hoods</b>                                                             |                |                                                             |         |        |
| Hood top entry low profile                                               | 20<br>25       | C146 11R006 606 1<br>C146 11R006 607 1                      |         |        |
| Hood top entry high profile                                              | 25<br>32       | C146 11R006 656 8<br>C146 11R006 606 8                      |         |        |
| Hood side entry low profile                                              | 16<br>20<br>25 | C146 11R006 556 1<br>C146 11R006 506 1<br>C146 11R006 507 1 |         |        |
| Hood side entry high profile                                             | 25<br>32       | C146 11R006 556 8<br>C146 11R006 506 8                      |         |        |
| <b>Housings</b>                                                          |                |                                                             |         |        |
| Housing bulkhead mounting Version A Standard flange without ground strap |                | C146 11F006 901 8                                           |         |        |
| Housing bulkhead mounting Version B Standard flange with ground strap    |                | C146 11F006 902 8                                           |         |        |
| Housing bulkhead mounting Version C Centering flange with ground strap   |                | C146 11F006 001 8                                           |         |        |

Panel cut out for bulkhead mounting



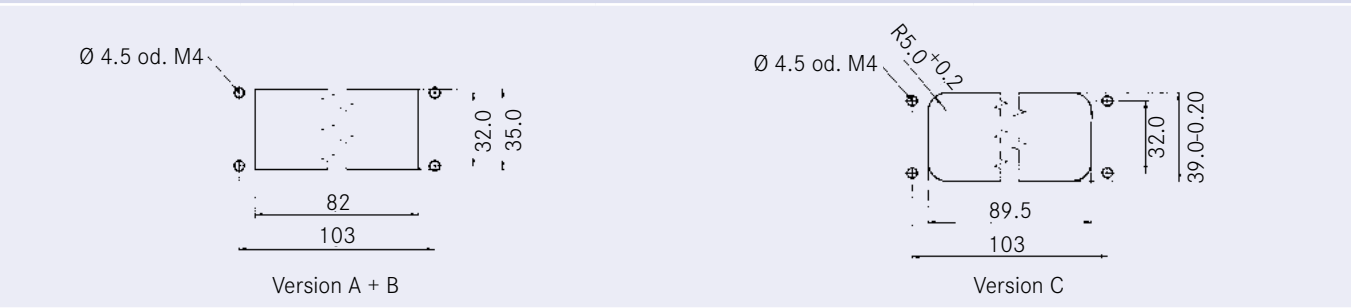
| Description                                                                          | M                 | Part Number       | Drawing | Figure |
|--------------------------------------------------------------------------------------|-------------------|-------------------|---------|--------|
| Hoods                                                                                |                   |                   |         |        |
| Hood<br>top entry<br>low profile                                                     | 20                | C146 11R010 650 1 |         |        |
|                                                                                      | 25                | C146 11R010 600 1 |         |        |
|                                                                                      | 32                | C146 11R010 601 1 |         |        |
| Hood<br>top entry<br>high profile                                                    | 25                | C146 11R010 650 8 |         |        |
|                                                                                      | 32                | C146 11R010 600 8 |         |        |
|                                                                                      | 40                | C146 11R010 601 8 |         |        |
| Hood<br>side entry<br>low profile                                                    | 20                | C146 11R010 550 1 |         |        |
|                                                                                      | 25                | C146 11R010 500 1 |         |        |
| Hood<br>side entry<br>high profile                                                   | 25                | C146 11R010 550 8 |         |        |
|                                                                                      | 32                | C146 11R010 500 8 |         |        |
| Housings                                                                             |                   |                   |         |        |
| Housing<br>bulkhead mounting<br>Version A<br>Standard flange<br>without ground strap | C146 11F010 901 8 |                   |         |        |
| Housing<br>bulkhead mounting<br>Version B<br>Standard flange<br>with ground strap    | C146 11F010 902 8 |                   |         |        |
| Housing<br>bulkhead mounting<br>Version C<br>Centering flange<br>with ground strap   | C146 11F010 000 8 |                   |         |        |

Panel cut out for bulkhead mounting

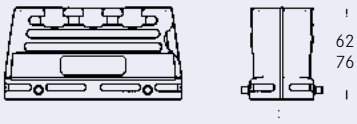
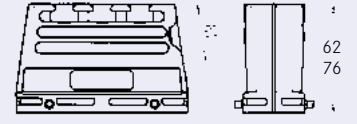
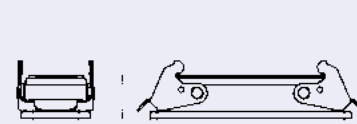
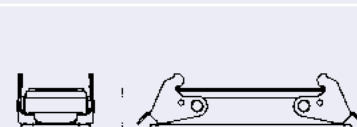
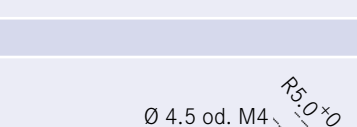
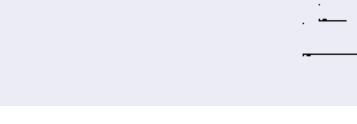
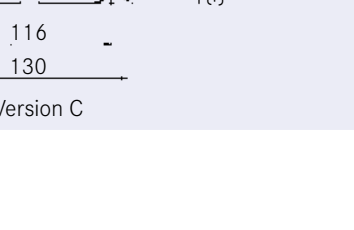


| Description                                                                          | M                 | Part Number                                                 | Drawing | Figure |
|--------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------|---------|--------|
| Hoods                                                                                |                   |                                                             |         |        |
| Hood<br>top entry<br>low profile                                                     | 25<br>32          | C146 11R016 650 1<br>C146 11R016 600 1                      |         |        |
| Hood<br>top entry<br>high profile                                                    | 25<br>32<br>40    | C146 11R016 650 8<br>C146 11R016 600 8<br>C146 11R016 601 8 |         |        |
| Hood<br>side entry<br>low profile                                                    | 25<br>32          | C146 11R016 550 1<br>C146 11R016 500 1                      |         |        |
| Hood<br>side entry<br>high profile                                                   | 25<br>32<br>40    | C146 11R016 550 8<br>C146 11R016 500 8<br>C146 11R016 501 8 |         |        |
| Housings                                                                             |                   |                                                             |         |        |
| Housing<br>bulkhead mounting<br>Version A<br>Standard flange<br>without ground strap | C146 11F016 901 8 |                                                             |         |        |
| Housing<br>bulkhead mounting<br>Version B<br>Standard flange<br>with ground strap    | C146 11F016 902 8 |                                                             |         |        |
| Housing<br>bulkhead mounting<br>Version C<br>Centering flange<br>with ground strap   | C146 11F016 000 8 |                                                             |         |        |

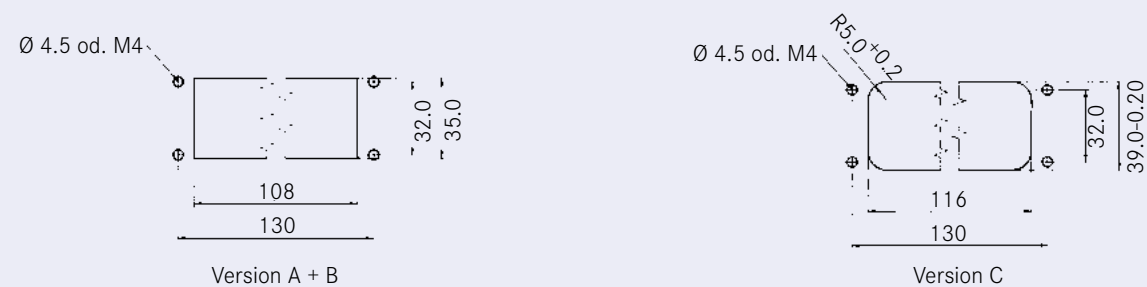
Panel cut out for bulkhead mounting





| Description                                                                          | M                 | Part Number                                                 | Drawing                                                                              | Figure                                                                                |
|--------------------------------------------------------------------------------------|-------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <b>Hoods</b>                                                                         |                   |                                                             |                                                                                      |                                                                                       |
| Hood<br>top entry<br>low profile                                                     | 25<br>32          | C146 11R024 650 1<br>C146 11R024 600 1                      |    |    |
| Hood<br>top entry<br>high profile                                                    | 25<br>32<br>40    | C146 11R024 650 8<br>C146 11R024 600 8<br>C146 11R024 601 8 |    |    |
| Hood<br>side entry<br>low profile                                                    | 25<br>32          | C146 11R024 550 1<br>C146 11R024 500 1                      |    |   |
| Hood<br>side entry<br>high profile                                                   | 25<br>32<br>40    | C146 11R024 550 8<br>C146 11R024 500 8<br>C146 11R024 501 8 |  |  |
| <b>Housings</b>                                                                      |                   |                                                             |                                                                                      |                                                                                       |
| Housing<br>bulkhead mounting<br>Version A<br>Standard flange<br>without ground strap | C146 11F024 901 8 |                                                             |  |  |
| Housing<br>bulkhead mounting<br>Version B<br>Standard flange<br>with ground strap    | C146 11F024 902 8 |                                                             |  |  |
| Housing<br>bulkhead mounting<br>Version C<br>Centering flange<br>with ground strap   | C146 11F024 000 8 |                                                             |  |  |

**Panel cut out for bulkhead mounting**





# heavy | mate<sup>®</sup> Housings

• Corrosion resistant Housings

## heavy | mate<sup>®</sup> Housings corrosion resistant Characteristics + Notes

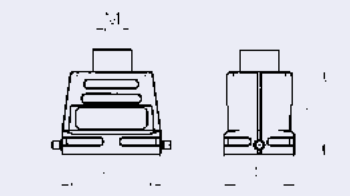
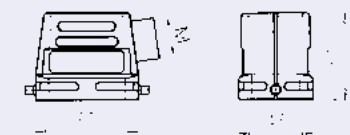
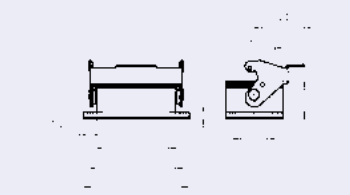
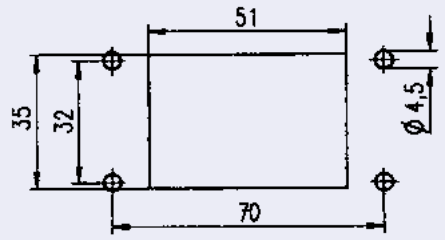
| General Characteristics    | Standard            | Value                      |
|----------------------------|---------------------|----------------------------|
| Protection class housing   |                     | IP65                       |
| Locking system             |                     | 2 locking levers           |
| Salt mist resistance       | IEC 60512-11-6:2002 | >500h                      |
| Climatical Characteristics |                     |                            |
| Climatic category          | IEC 60068-1         | 40 / 100 / 21              |
| Upper temperature          | IEC 60512-11-9      | + 100 °C                   |
| Lower temperature          | IEC 60512-11-10     | - 40 °C                    |
| Mechanical Characteristics |                     |                            |
| Mechanical operation       | IEC 60512-9-1       | ≥ 500 mating cycles        |
| Materials                  |                     |                            |
| Housings                   |                     | Aluminium die cast alloy   |
| Colour housings            |                     | grey – similar to RAL 9005 |
| Rubber gasket              |                     | NBR                        |
| Locking lever              |                     | steel / special coated     |
| Surface                    |                     | conducting special surface |

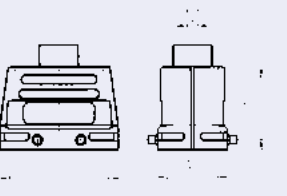
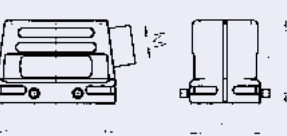
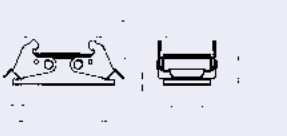
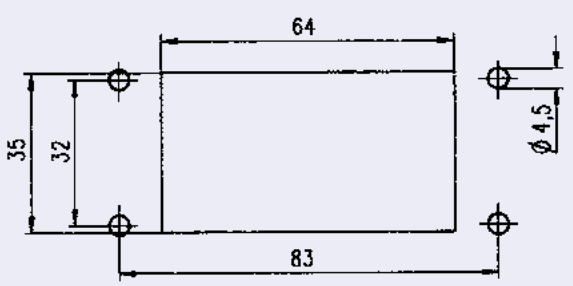
### General information

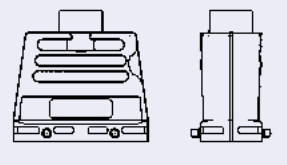
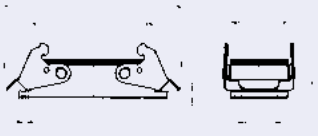
500h salt mist resistance can be achieved when using a plastic cable gland.  
When a metal cable gland is required, we recommend to use additionally our special studs on the hoods to achieve this value.

Order codes are:  
N16 025 0112 5 X Metal stud M25 corrosion resistant  
N16 032 0112 5 X Metal stud M32 corrosion resistant  
N16 040 0112 5 X Metal stud M40 corrosion resistant

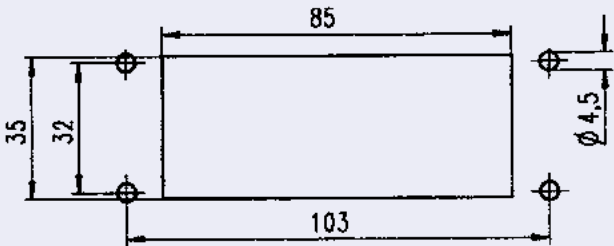


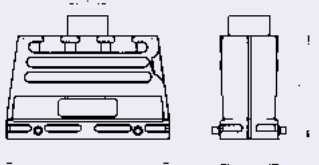
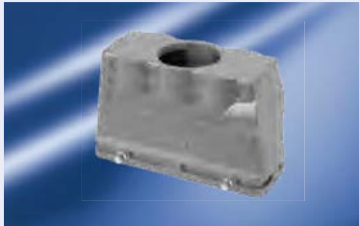
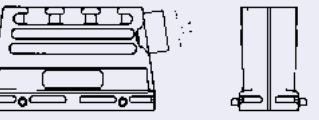
| Description                                                                         | M  | Part Number       | Drawing                                                                             | Figure                                                                               |
|-------------------------------------------------------------------------------------|----|-------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Hoods                                                                               |    |                   |                                                                                     |                                                                                      |
| Hood top entry                                                                      | 25 | C146 50R006 607 1 |   |   |
| Hood side entry                                                                     | 25 | C146 50R006 507 1 |   |   |
| Housings                                                                            |    |                   |                                                                                     |                                                                                      |
| Housing bulkhead mounting                                                           |    | C146 50F006 000 1 |  |  |
| Panel cut out for bulkhead mounting                                                 |    |                   |                                                                                     |                                                                                      |
|  |    |                   |                                                                                     |                                                                                      |

| Description                                                                           | M  | Part Number       | Drawing                                                                             | Figure                                                                               |
|---------------------------------------------------------------------------------------|----|-------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Hoods                                                                                 |    |                   |                                                                                     |                                                                                      |
| Hood top entry                                                                        | 25 | C146 50R010 600 1 |  |   |
| Hood side entry                                                                       | 25 | C146 50R010 500 1 |  |   |
| Housings                                                                              |    |                   |                                                                                     |                                                                                      |
| Housing bulkhead mounting                                                             |    | C146 50F010 000 1 |  |  |
| Panel cut out for bulkhead mounting                                                   |    |                   |                                                                                     |                                                                                      |
|  |    |                   |                                                                                     |                                                                                      |

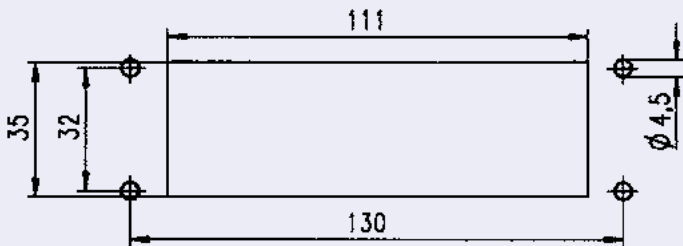
| Description               | M  | Part Number       | Drawing                                                                            | Figure                                                                               |
|---------------------------|----|-------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Hoods                     |    |                   |                                                                                    |                                                                                      |
| Hood top entry            | 32 | C146 50R016 600 8 |   |   |
| Hood side entry           | 32 | C146 50R016 500 8 |   |   |
| Housings                  |    |                   |                                                                                    |                                                                                      |
| Housing bulkhead mounting |    | C146 50F016 000 1 |  |  |

Panel cut out for bulkhead mounting



| Description               | M  | Part Number       | Drawing                                                                             | Figure                                                                               |
|---------------------------|----|-------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Hoods                     |    |                   |                                                                                     |                                                                                      |
| Hood top entry            | 40 | C146 50R024 601 8 |  |   |
| Hood side entry           | 40 | C146 50R024 501 8 |  |   |
| Housings                  |    |                   |                                                                                     |                                                                                      |
| Housing bulkhead mounting |    | C146 50F024 000 1 |  |  |

Panel cut out for bulkhead mounting

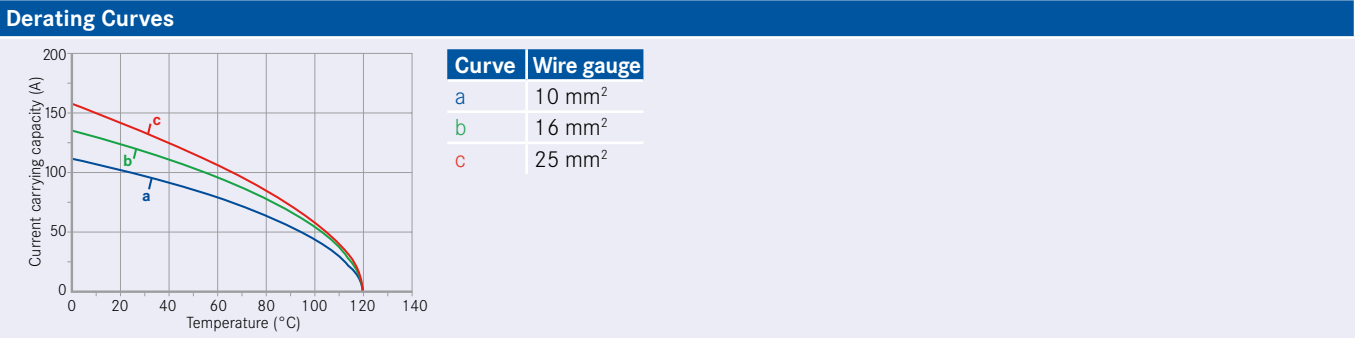




## heavy | mate<sup>®</sup> Accessories

- Wallbushing universal port
- Gland bushings
- Key pin and locking devices
- Foam rubber sealing
- Label for CSA regulation
- Shielding lever
- Wall brackets
- Tolerance compensation system

| General Characteristics                     | Standard          | Value                        |
|---------------------------------------------|-------------------|------------------------------|
| Number of contacts                          |                   | 1                            |
| Termination technique                       |                   | crimp                        |
| Wire gauge                                  |                   | 10 - 25 mm² (Radsok)         |
| Termination technique ( wall and cable lug) |                   | screw                        |
| Wall thickness                              |                   | 1.5 - 6 mm                   |
| Dimensions of wall cutout                   |                   | Ø 31.5 mm ± 0.2 without burr |
| Torque when mounting the WBC                |                   | 6Nm ± 3%                     |
| Mechanical and Electrical Characteristics   |                   |                              |
| Protection class (side wall to side wall)   | IEC 60 529        | IP67                         |
| Protection class (Radsokseite)              | IEC 60 529        | IP20                         |
| Rated voltage                               | IEC 61140 cl. 6   | ≤ 60 V DC / ≤ 25 V AC        |
| Contact resistance                          | IEC 60512; test 1 | ≤ 0.2 mΩ                     |
| Climatical Characteristics                  |                   |                              |
| Upper temperature                           | IEC 60512-11-9    | +125°C                       |
| Lower temperature                           | IEC 60512-11-10   | -40°C                        |



**Pluggable equipotential bonding with Wallbushing universal port**

The Wallbushing universal port is a pluggable grounding system. Based on the two patented Wallbushing and Radsok technologies, the Wallbushing universal port enables a practical equipotential bonding, which need not be time consuming hardwired. For this purpose, only standard tools are needed, even for the most one-sided montage. The click | fit technology is furthermore vibration-proofed and VDE approved as a grounding connection.

| Description                                 | Part Number       | Drawing | Figure |
|---------------------------------------------|-------------------|---------|--------|
| <b>Wallbushing Connector universal port</b> |                   |         |        |
| Wallbushing Connector universal port 6 mm   | C360 10D001 002 2 |         |        |
| Housings for 6mm Radsok for 10 - 16 mm²     | C360 G01 141 E2   |         |        |
| Housings for 6 mm Radsok for 25 mm²         | C360 G01 341 E2   |         |        |

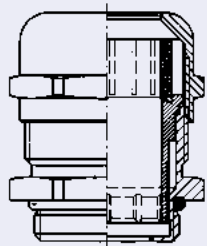
| Supplied as                 | for wire gauge | AWG | Pieces | Part Number      |                 | Figure |
|-----------------------------|----------------|-----|--------|------------------|-----------------|--------|
|                             |                |     |        | Socket contact   | for housings    |        |
| <b>6 mm Radsok contacts</b> |                |     |        |                  |                 |        |
| Single contact              | 10 - 16 mm²    |     | 50     | N02 060 6164 002 | C360 G01 141 E2 |        |
|                             | 25 mm²         |     | 50     | N02 060 6165 002 | C360 G01 341 E2 |        |

| Tools                               |                  |                 |               |                                              |
|-------------------------------------|------------------|-----------------|---------------|----------------------------------------------|
| Description                         | for wire gauge   | Contact locator | Part Number   | Tool                                         |
|                                     |                  |                 | Crimping dies |                                              |
| Electro hydraulic crimping tool     |                  |                 |               | TE0500 /<br>Klauke Part Number:<br>EK 12042L |
| Crimping dies<br>N02 060 6164 002   | 10 mm²<br>16 mm² |                 |               | TE0500 - 081<br>TE0500 - 061                 |
| Crimping dies<br>N02 060 6165 002   | 25 mm²           |                 |               | TE0500 - 041                                 |
| Further tools see catalogue “Tools” |                  |                 |               |                                              |



Assembly instructions for metric clamp

- The cable jacket should be removed as far as the underside of the cable clamping; the wire netting is then to be cut down a little further and subsequently must be formed into a circular rim. The protective jacket can remain attached to the cable provided that it passes through the lower opening of the clamp.
- On assembly, while screwing the cable clamp, the circular rim has to be pushed through and pressed on the fins commutator on the base of the underside and settle into a depression. By doing this the EMC security will remain.
- Tightening torque of the gland bushing:



| Description                                                                                   | M  | Part Number     | Drawing | Figure |
|-----------------------------------------------------------------------------------------------|----|-----------------|---------|--------|
| <b>Gland bushing IP54 (Attention: not usable for hoods without stud / -30°C up to +120°C)</b> |    |                 |         |        |
| Thermoplast clamp with variable inner diameter<br>10 Pieces                                   | 20 | VN16 200 0113 X |         |        |
| Metal with variable inner diameter<br>10 Pieces                                               | 20 | VN16 200 0114 X |         |        |
|                                                                                               | 25 | VN16 250 0114 X |         |        |
|                                                                                               | 32 | VN16 320 0114 X |         |        |
|                                                                                               | 40 | VN16 400 0114 X |         |        |
|                                                                                               | 50 | VN16 500 0114 X |         |        |
| Cable clamp without gasket<br>5 Pieces                                                        | 16 | VN16 160 0102 V |         |        |
|                                                                                               | 20 | VN16 200 0102 V |         |        |
|                                                                                               | 25 | VN16 250 0102 V |         |        |
|                                                                                               | 32 | VN16 320 0102 V |         |        |
| Cable clamp without gasket<br>5 Pieces                                                        | 20 | VN16 200 0103 V |         |        |
|                                                                                               | 25 | VN16 250 0103 V |         |        |
|                                                                                               | 32 | VN16 320 0103 V |         |        |
| Stud <sup>1)</sup>                                                                            | 16 | N16 016 0112 1  |         |        |
|                                                                                               | 20 | N16 020 0112 1  |         |        |
|                                                                                               | 25 | N16 025 0112 1  |         |        |
|                                                                                               | 32 | N16 032 0112 1  |         |        |
|                                                                                               | 40 | N16 040 0112 1  |         |        |

| Description                                                   | Clamping range<br>ø in mm | A in mm | M  | Part Number       | Drawing | Figure |
|---------------------------------------------------------------|---------------------------|---------|----|-------------------|---------|--------|
| <b>Gland bushing IP67 (Material PA / - 20 °C + 80 °C)</b>     |                           |         |    |                   |         |        |
| Gland bushing with vibration protection<br>10 Pieces          | 4 - 10                    | 20      | 16 | VN16 160 0127 X   |         |        |
|                                                               | 6 - 12                    | 24      | 20 | VN16 200 0127 X   |         |        |
|                                                               | 9 - 16                    | 28      | 25 | VN16 250 0127 X   |         |        |
|                                                               | 10 - 21                   | 36      | 32 | VN16 320 0127 X   |         |        |
|                                                               | 16 - 28                   | 46      | 40 | VN16 400 0127 X   |         |        |
| Plugs brass nickel-plated with recess and o-ring<br>10 Pieces |                           |         | 20 | VN16 020 0113 1 X |         |        |
|                                                               |                           |         | 25 | VN16 025 0113 1 X |         |        |
|                                                               |                           |         | 32 | VN16 032 0113 1 X |         |        |
|                                                               |                           |         | 40 | VN16 040 0113 1 X |         |        |

| Description                                                  | Clamping range F<br>in mm | H in mm | L in mm | M  | Part Number     | Drawing | Figure |
|--------------------------------------------------------------|---------------------------|---------|---------|----|-----------------|---------|--------|
| <b>Gland bushing IP68 (Material CuZn / - 30 °C + 120 °C)</b> |                           |         |         |    |                 |         |        |
| Gland bushing<br>10 Pieces                                   | 5,5 - 10                  | 22      | 5,5     | 16 | VN16 160 0133 X |         |        |
|                                                              | 8 - 13                    | 24      | 6       | 20 | VN16 200 0133 X |         |        |
|                                                              | 11 - 18                   | 29      | 7       | 25 | VN16 250 0133 X |         |        |
|                                                              | 15 - 21                   | 30      | 8       | 32 | VN16 320 0133 X |         |        |
|                                                              | 19 - 27                   | 34      | 8       | 40 | VN16 400 0133 X |         |        |

| Description                                                           | Clamping range F<br>in mm | M  | Part Number     | Drawing | Figure |
|-----------------------------------------------------------------------|---------------------------|----|-----------------|---------|--------|
| <b>EMC gland bushing IP68 (Material CuZn / PA / - 30 °C + 120 °C)</b> |                           |    |                 |         |        |
| Gland bushing EMV<br>10 Pieces                                        | 5.5 - 10                  | 16 | VN16 160 0126 X |         |        |
|                                                                       | 8 - 13                    | 20 | VN16 200 0126 X |         |        |
|                                                                       | 11 - 18                   | 25 | VN16 250 0126 X |         |        |
|                                                                       | 15 - 21                   | 32 | VN16 320 0126 X |         |        |
|                                                                       | 19 - 27                   | 40 | VN16 400 0126 X |         |        |

[illegible]

**Polarization system with key pin**

For housings with one contact insert

For housings with two contact inserts

**Descriptions**

- Key pin
- Locking screw
- M Pin insert
- F Socket insert

**Polarization system with guide pin and guide socket**

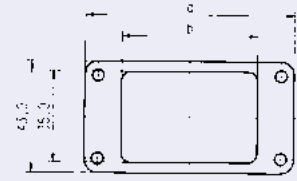
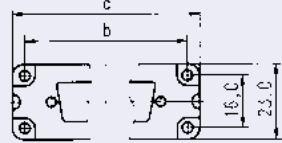
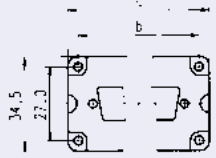
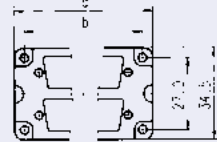
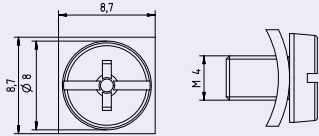
For housings with one contact insert

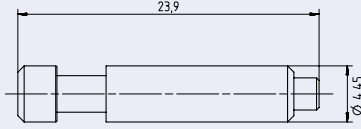
For housings with two contact inserts

**Descriptions**

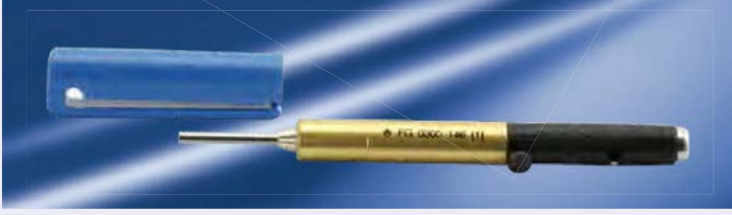
- Guide pin
- Guide socket
- + Locking screw
- M Pin insert
- F Socket insert



| Description                            | Size            | Part Number     | a    | b    | D-Sub | Drawing                                                                              | Figure                                                                                |
|----------------------------------------|-----------------|-----------------|------|------|-------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Foam rubber sealing 2 mm               | 6               | N06 080 0003 1  | 80   | 70   |       |     |    |
|                                        | 10              | N06 080 0003 2  | 93   | 83   |       |                                                                                      |                                                                                       |
|                                        | 16              | N06 080 0003 3  | 113  | 103  |       |                                                                                      |                                                                                       |
|                                        | 24              | N06 080 0003 4  | 140  | 130  |       |                                                                                      |                                                                                       |
| Adaptor for D-Sub set metal            | 15              | C146 N32 015 G2 | 57   | 49.5 | 15    |    |    |
|                                        | 25              | C146 N32 025 G2 | 57   | 49.5 | 25    |                                                                                      |                                                                                       |
| Adaptor for D-Sub set single-row       | 6               | C146 N32 009 G1 | 51.5 | 44   | 9     |     |    |
|                                        | 6               | C146 N32 015 G1 | 51.5 | 44   | 15    |                                                                                      |                                                                                       |
|                                        | 10              | C146 N32 025 G1 | 64.5 | 57   | 25    |                                                                                      |                                                                                       |
|                                        | 16              | C146 N32 037 G1 | 85   | 77.5 | 37    |                                                                                      |                                                                                       |
|                                        | 16              | C146 N32 050 G1 | 85   | 77.5 | 50    |                                                                                      |                                                                                       |
| Adaptor for D-Sub set double-row       | 6               | C146 N33 009 G1 | 51.5 | 44   | 9     |    |   |
|                                        | 6               | C146 N33 015 G1 | 51.5 | 44   | 15    |                                                                                      |                                                                                       |
|                                        | 10              | C146 N33 025 G1 | 64.5 | 57   | 25    |                                                                                      |                                                                                       |
|                                        | 16              | C146 N33 037 G1 | 85   | 77.5 | 37    |                                                                                      |                                                                                       |
|                                        | 16              | C146 N33 050 G1 | 85   | 77.5 | 50    |                                                                                      |                                                                                       |
| PE-Screw + washer                      | M4              | VN03 040 0001 X | -    | -    | -     |  |  |
| Label for CSA application<br>50 Pieces | VN07 045 0001 L |                 |      |      |       |                                                                                      |  |

| Description                | Part number     | Drawing                                                                             | Figure                                                                              |
|----------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Coding element</b>      |                 |                                                                                     |                                                                                     |
| Coding element (10 Pieces) | VN17 045 0001 X |  |  |

heavy|mate® Removal tools

| Kontaktdurchmesser          | Part number      | Figure                                                                               |
|-----------------------------|------------------|--------------------------------------------------------------------------------------|
| 1.0 mm                      | 17D 438 SP       |    |
| 1.6 mm                      | FG 0300 146 1    |    |
| 2.5 mm turned, with clip    | FG 0300 146 4    |    |
| 2.5 mm turned, without clip | FG 0300 146 7    |   |
| 2.5 mm, stamped             | FG 0200 146 1    |  |
| 3.6 mm                      | FG 0300 146 3    |  |
| 4 mm                        | FG 0300 146 5000 |  |
| 8 mm                        | FG 0300 146 6000 |  |

heavy|mate® Accessories Cable lug for earth connection

| Supplied as                    | for<br>wire gauge                       | AWG   | Pieces | Part number                        | Figure                                                                              |
|--------------------------------|-----------------------------------------|-------|--------|------------------------------------|-------------------------------------------------------------------------------------|
| Cable lug for earth connection |                                         |       |        |                                    |                                                                                     |
| Cable lug                      | 6 mm <sup>2</sup><br>10 mm <sup>2</sup> |       | 20     | VN15 006 0009 Z<br>VN15 010 0007 Z |  |
| Single contact                 | 10 - 16 mm <sup>2</sup>                 | 8 - 6 | 1      | N 15 043 0003 003                  |  |

Clamp 1 under screw is approved for wires up to 6 mm2 (with wire end sleeve). For wires 10 - 16 mm² please use clamp 2 with cable lug.

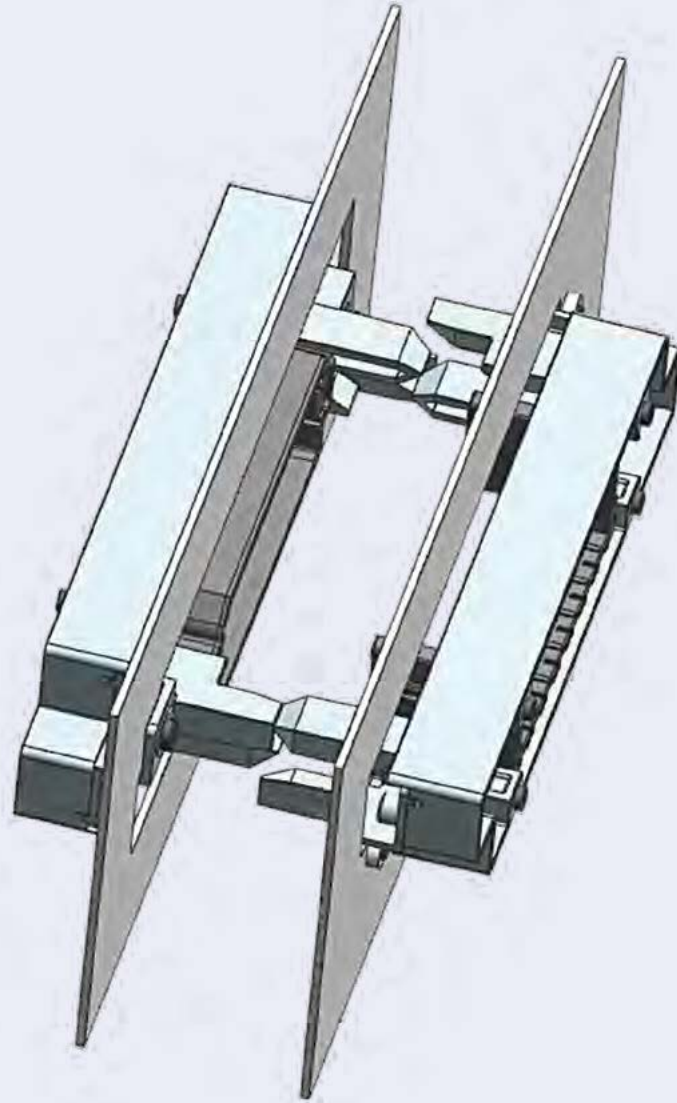


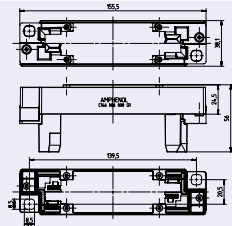
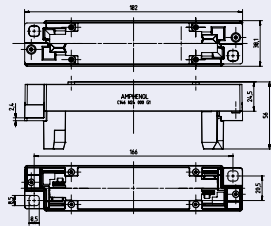
| Description                                       | Part Number    | Drawing | Figure |
|---------------------------------------------------|----------------|---------|--------|
| Shielding levers for contact inserts              |                |         |        |
| Shielding lever for contact inserts<br>Size E6    | N 25 006 0012  |         |        |
| Shielding lever for contact inserts<br>Size E10   | N 25 010 0012  |         |        |
| Shielding lever for contact inserts<br>Size E16   | N 25 016 0012  |         |        |
| Shielding lever for contact inserts<br>Size E24   | N 25 024 0011  |         |        |
| Shielding levers for module frames heavy I mate F |                |         |        |
| Shielding lever for module frames<br>Size E6      | N 25 006 2001  |         |        |
| Shielding lever for module frames<br>Size E 10    | N 25 010 0001  |         |        |
| Shielding lever for module frames<br>Size E16     | N 25 016 0001  |         |        |
| Shielding lever for module frames<br>Size E24     | N 25 024 000 1 |         |        |

| Wall brackets                                                                                                          |                |         |        |
|------------------------------------------------------------------------------------------------------------------------|----------------|---------|--------|
| Accessories for use of heavy mate® contact inserts without housing, for example on mounting rails in control cabinets. |                |         |        |
| Figure                                                                                                                 |                |         |        |
|                                                                                                                        |                |         |        |
| Description                                                                                                            | Part Number    | Drawing | Figure |
| Coupling                                                                                                               | N 09 146 0006  |         |        |
| Wall bracket                                                                                                           | N 09 146 0007  |         |        |
| Wall bracket                                                                                                           | N 09 146 0008  |         |        |
| Mounting rail adaptor                                                                                                  | N 09 146 000 9 |         |        |
| Mounting rail adaptor fits to hat rail 35 mm x 7.5 mm und 35 mm x 15 mm acc. EN 50022 / DIN EN 60715                   |                |         |        |

| Characteristics                                                                                                                                                                                                                                                                     | Applications                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• heavy mate® inserts can be used in blind mate applications</li><li>• tolerance compensation of 3 mm in any direction possible</li><li>• can be used with module frame &amp; monoblocs</li><li>• very good price-performance ratio</li></ul> | <ul style="list-style-type: none"><li>• Motor control centers</li><li>• Modular UPS</li><li>• Inverter</li><li>• Charging stations</li><li>• Slip rings</li></ul> |

Figure

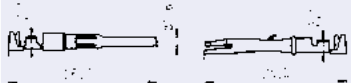
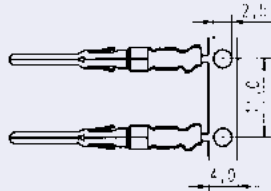
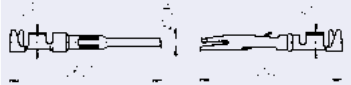
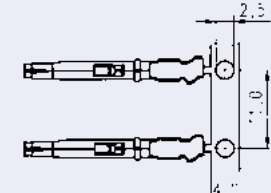
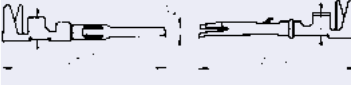
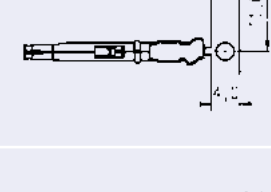
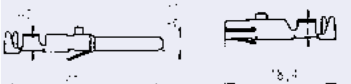
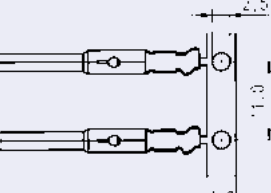
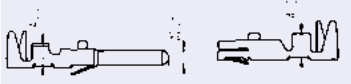
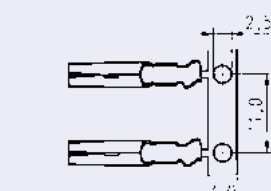
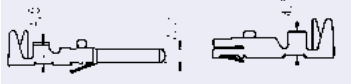
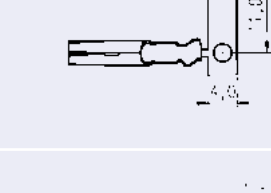
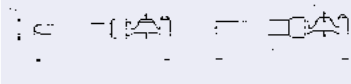
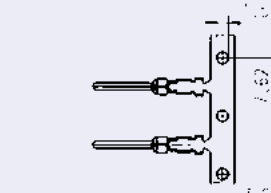
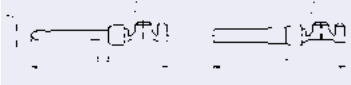
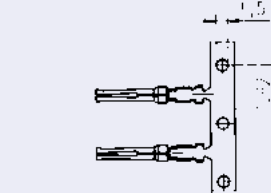


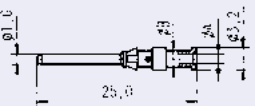
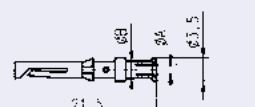
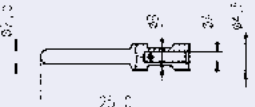
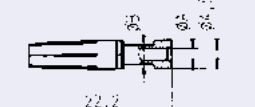
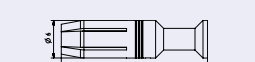
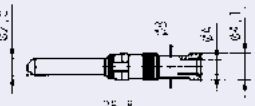
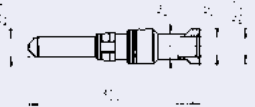
| Description                                          | Part Number     | Drawing                                                                             | Figure                                                                              |
|------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Frames for tolerance compensation system<br>Size E10 | C146 N10 000 G1 |                                                                                     |  |
| Frames for tolerance compensation system<br>Size E16 | C146 N16 000 G1 |  |  |
| Frames for tolerance compensation system<br>Size E24 | C146 N24 000 G1 |  |  |



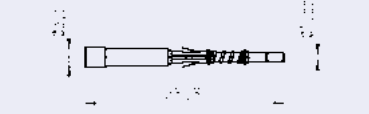
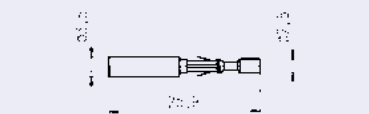
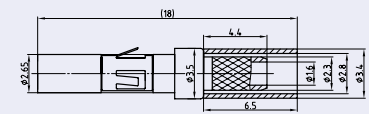
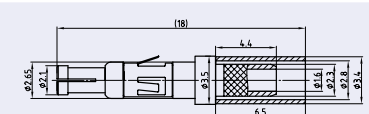
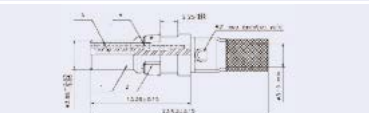
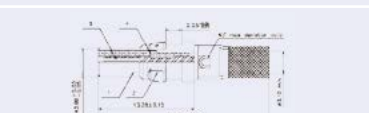
## heavy | mate<sup>®</sup> Information

- Drawings contacts
- Safety classification
- Technical information

| Series           | Drawing single contact                                                                                                                                                              | Drawing contacts on reel                                                                                                                                                     | Figure                                                                                |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| heavy mate® D, M | .N01 016 0003 1 .N02 016 0003 1<br>                                                                | <br>     |    |
|                  | .N01 016 0002 1 .N02 016 0002 1<br>.N01 016 0015 1 <sup>1)</sup> .N02 016 0015 1 <sup>1)</sup><br> | <br>     |                                                                                       |
|                  | .N01 016 0005 1 .N02 016 0005 1<br>.N01 016 0016 1 <sup>1)</sup> .N02 016 0016 1 <sup>1)</sup><br> | <br>     |                                                                                       |
| heavy mate® E, M | .N01 025 0001 1 .N02 025 0001 1<br>                                                                | <br>    |   |
|                  | .N01 025 0010 1 .N02 025 0010 1<br>                                                               | <br> |                                                                                       |
|                  | .N01 025 0043 1 .N02 025 0043 1<br>                                                              | <br> |                                                                                       |
| heavy mate® M    | .N01 010 0130 2 .N02 010 0130 2<br>                                                              | <br> |  |
|                  | .N01 010 0131 2 .N02 010 0131 2<br>                                                              | <br> |                                                                                       |

| Series                                | Part Number                                                                                                                              | Wire gauge                                                   | B                                              | Identific.                                                                  | Drawing                                                                                                | Figure                                                                                |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| heavy mate®<br>D, DD, M<br>100 Pieces | VN01 016 0024 1C<br>VN01 016 0025 1C<br>VN01 016 0026 1C<br>VN01 016 0027 1C<br>VN01 016 0028 1C                                         | 0.14 - 0.37<br>0.5<br>0.75 - 1.0<br>1.5<br>2.5               | 2.6<br>2.6<br>2.6<br>3.0<br>3.2                | 1<br>2<br>3<br>4<br>5                                                       | .N01 016 002X<br>   |    |
|                                       | VN02 016 0024 1C<br>VN02 016 0025 1C<br>VN02 016 0026 1C<br>VN02 016 0027 1C<br>VN02 016 0028 1C                                         | 0.14 - 0.37<br>0.5<br>0.75 - 1.0<br>1.5<br>2.5               | 2.6<br>2.6<br>2.6<br>3.0<br>3.2                | 1<br>2<br>3<br>4<br>5                                                       | .N02 016 002X<br>   |                                                                                       |
| heavy mate®<br>E, EE<br>100 Pieces    | VN01 025 0055 1C<br>VN01 025 0035 1C<br>VN01 025 0036 1C<br>VN01 025 0037 1C<br>VN01 025 0038 1C<br>VN01 025 0059 1C<br>VN01 025 0039 1C | 0.14 - 0.37<br>0.5<br>0.75 - 1.0<br>1.5<br>2.5<br>3.0<br>4.0 | 2.7<br>2.6<br>2.6<br>3.0<br>3.45<br>3.7<br>4.0 | no slot<br>no slot<br>1 slot<br>2 slots<br>3 slots<br>1 big slot<br>no slot | .N01 025 003X<br>   |    |
|                                       | VN02 025 0055 1C<br>VN02 025 0035 1C<br>VN02 025 0036 1C<br>VN02 025 0037 1C<br>VN02 025 0038 1C<br>VN02 025 0059 1C<br>VN02 025 0039 1C | 0.14 - 0.37<br>0.5<br>0.75 - 1.0<br>1.5<br>2.5<br>3.0<br>4.0 | 2.7<br>2.6<br>2.6<br>3.0<br>3.45<br>3.7<br>4.0 | no slot<br>no slot<br>1 slot<br>2 slots<br>3 slots<br>1 big slot<br>no slot | .N02 025 003X<br>   |                                                                                       |
| heavy mate®<br>F, K, Q<br>100 Pieces  | VN01 040 0010 1C<br>VN01 040 0011 1C<br>VN01 040 0012 1C<br>VN01 040 0013 1C<br>VN01 040 0015 1C                                         | 1.5<br>2.5<br>4<br>6<br>10                                   | 3<br>3.5<br>4.1<br>5<br>5.65                   | slot 1, 2<br>slot 1, 2, 3<br>no slot<br>slot 1<br>slot 2, 3                 |                   |   |
|                                       | VN02 040 0010 1C<br>VN02 040 0011 1C<br>VN02 040 0012 1C<br>VN02 040 0013 1C<br>VN02 040 0015 1C                                         | 1.5<br>2.5<br>4.0<br>6.0<br>10.0                             | 3<br>3.5<br>4.1<br>5<br>5.65                   | slot 1, 2<br>slot 1, 2, 3<br>no slot<br>slot 1<br>slot 2, 3                 |                   |                                                                                       |
| heavy mate®<br>M<br>100 Pieces        | VN01 025 0029 1C<br>VN01 025 0030 1C<br>VN01 025 0031 1C<br>VN01 025 0032 1C<br>VN01 025 0033 1C                                         | 0.5<br>0.75 - 1.0<br>1.5<br>2.5<br>4.0                       | 2.6<br>2.6<br>3.0<br>3.45<br>3.9               |                                                                             | .N01 025 00XX<br> |  |
|                                       | VN02 025 0029 1C<br>VN02 025 0030 1C<br>VN02 025 0031 1C<br>VN02 025 0032 1C<br>VN02 025 0033 1C                                         | 0.5<br>0.75 - 1.0<br>1.5<br>2.5<br>4.0                       | 2.6<br>2.6<br>3.0<br>3.45<br>3.9               |                                                                             | .N02 025 00XX<br> |                                                                                       |
|                                       | VN01 036 0004 1C<br>VN01 036 0005 1C<br>VN01 036 0001 1C<br>VN01 036 0002 1C<br>VN01 036 0003 1C<br>VN01 036 0021 1C                     | 1.5<br>2.5<br>4.0<br>6.0<br>10.0<br>16.0                     | 3<br>3.45<br>3.9<br>4.6<br>5.9<br>8.3          | 2 slots<br>3 slots<br>no slot<br>1 slot<br>2 slots<br>no slot               | .N01 036 000X<br> |  |
|                                       | VN02 036 0004 1C<br>VN02 036 0005 1C<br>VN02 036 0001 1C<br>VN02 036 0002 1C<br>VN02 036 0003 1C<br>VN02 036 0021 1C                     | 1.5<br>2.5<br>4.0<br>6.0<br>10.0<br>16.0                     | 3<br>3.45<br>3.9<br>4.6<br>5.9<br>8.3          | 2 slots<br>3 slots<br>no slot<br>1 slot<br>2 slots<br>no slot               | .N02 036 000X<br> |                                                                                       |



| Series              | Part Number    | Drawing single contact                                                             | Figure                                                                              |
|---------------------|----------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| heavy mate® M, FO   | N01 016 0040 8 |  |  |
|                     | N02 016 0040 8 |  |                                                                                     |
| heavy mate® M, Coax | 17 DM 537 421  |  |  |
|                     | 17 DM 537 401  |  |                                                                                     |
|                     | 17 DM 537 425  |  |                                                                                     |
|                     | 17 DM 537 405  |  |                                                                                     |

| Style                               | enclosed | unenclosed | earthing contact | cable clamp | finger safety mated |
|-------------------------------------|----------|------------|------------------|-------------|---------------------|
| Hood with pin insert                | ●        |            | ●                |             | ●                   |
| Pin insert                          |          | ●          | ●                |             |                     |
| Hood with socket insert             | ●        |            | ●                |             | ●                   |
| Socket insert                       |          | ●          | ●                |             |                     |
| Coupling housing with pin insert    | ●        |            | ●                |             | ●                   |
| Coupling housing with socket insert | ●        |            | ●                |             | ●                   |
| Housing with pin insert             | ●        |            | ●                |             | ●                   |
| Housing with socket insert          | ●        |            | ●                |             | ●                   |

| finger safety unmated | hand back safety mated | connetor with breaking capacity <sup>1)</sup> | rewirable | Cable clamp        |                       | Style                               |
|-----------------------|------------------------|-----------------------------------------------|-----------|--------------------|-----------------------|-------------------------------------|
|                       |                        |                                               |           | with <sup>2)</sup> | without <sup>3)</sup> |                                     |
|                       | ●                      | ●                                             | ●         | ●                  | ●                     | Hood with pin insert                |
|                       |                        | ●                                             | ●         | 4)                 | ●                     | Pin insert                          |
| ●                     | ●                      | ●                                             | ●         | ●                  | ●                     | Hood with socket insert             |
|                       |                        | ●                                             | ●         | 4)                 | ●                     | Socket insert                       |
|                       |                        | ●                                             | ●         | ●                  | ●                     | Coupling housing with pin insert    |
| ●                     | ●                      | ●                                             | ●         | ●                  | ●                     | Coupling housing with socket insert |
|                       | ●                      | ●                                             | ●         | ●                  | ●                     | Housing with pin insert             |
| ●                     | ●                      | ●                                             | ●         | ●                  | ●                     | Housing with socket insert          |

If not otherwise stated the contact inserts have to be mounted in metallic conductive housings resp. on bars or mounting boards to complete the protective earth grounding.





General technical information

- The safety of connectors/connectors with braking capacity (CBC) depends on the right selection of products, the correct installation and a proper assembly.
  - Decisions for the application of connectors are the requirements of the equipment specifications. This is especially the case for the definition of the rated voltage and the related clearances and creepage distances.
  - All rated data for the connectors listed in this catalogue is based on overvoltage category III and pollution degree 3 (machine tool application).
  - All technical data is specified for connectors, which are not under load when mated or disconnected. If in special cases connectors can be used in the sense of plug and socket devices (connector with breaking capacity), this is mentioned in the brief information of the particular section.
  - Correct mounting will protect against electrical shock when mating the connectors.
  - If connectors are mounted in non conductive housings both protective earthing terminals shall be mounted.
  - A detailed connector glossary can be found at the end of this catalogue.
  - All mentioned excerpts of standards are for general information only. For specific cases the valid original standards have to be consulted.
- Test methods acc. IEC 60512 comply with test methods acc. DIN EN 60512 or DIN IEC 60512. IEC 60664-1 complies with DIN VDE 0110-1
  - On screw terminations with wire protection as well as on protective earth contacts the usage of wire end sleeves are recommended.
  - Tightening torque of mounting screws (M3 screws on PE contact): 1.2 – 1.8 Nm
  - For mounting the housings size A10, A16 and E xx a M4 cheese head screw acc. to DIN xx (class min. 8.8) is recommended, tightening torque of the M4 screw 1.0 Nm.
  - Recommended tightening torque for PE connection screw: 1.8 Nm
  - Termination cross-section for PE contact max. 6 mm² (AWG10), for bigger cross-sections (10-16 mm² / AWG8-6) use cable lug N 15 043 0003 003
  - Heavy|mate D, DD, E, EE, EEE, F, K and Q are according EN45545 class R22/R23:HL3
  - The max. allowed insulation diameter depends on the contacts insert, for the specific limit see customer drawing/catalogue page
  - When connecting the PE you have to pay attention that the PE is connected properly
  - Requirements on panel cut outs on customer machine:
    - Flatness: max. 0.2mm
    - no sharp edges allowed
    - chamfer on sharp edges 0.2 x 45°
    - general tolerance ISO 2768-fH
- 

Termination methods: Screw connection

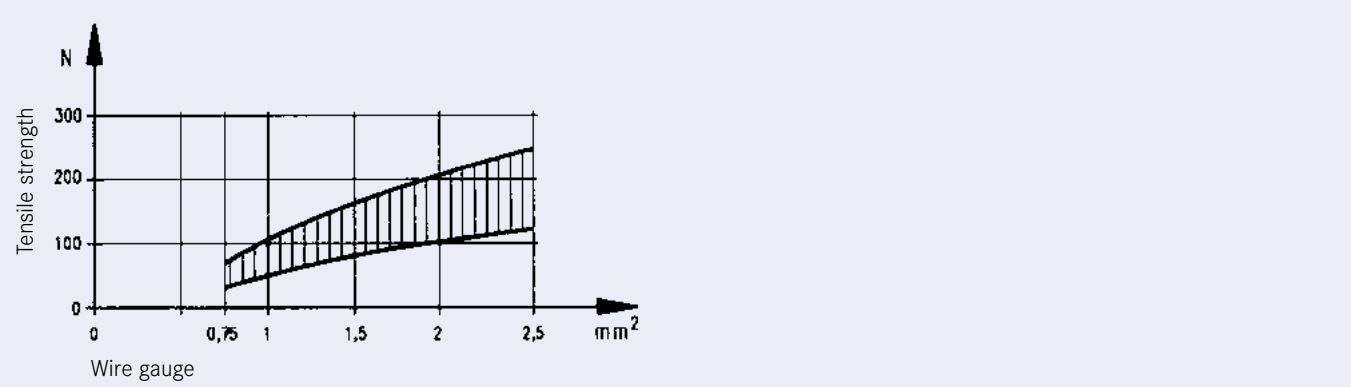
Screw clamps are designed acc. to EN 60999-1/VDE 0609. Chart 1 below shows the screw size depending on wire size and the required clamping and testing torque.

Chart 1

| Wire size (mm²)   | 1     | 1.5 | 2.5 | 4     | 6   | 10  |
|-------------------|-------|-----|-----|-------|-----|-----|
| Screw size        | M 2.6 | M 3 | M 3 | M 3.5 | M 4 | M 4 |
| Test torque (Ncm) | 40    | 50  | 50  | 80    | 120 | 120 |

Diagram 1 below shows the range of tensile strength for a screw connection with a clamp screw M3, fastened with a torque of 50 Ncm, depending on the wire size.

Diagram 1



Crimp connection

Chart 2: Tensile strength for crimp connetions

| Wire size | Tensile strength |        |
|-----------|------------------|--------|
|           | mm²              | AWG ¹) |
| 0.05      | 30               | 6      |
| 0.08      | 28               | 11     |
| 0.12      | 26               | 15     |
| 0.14      |                  | 18     |
| 0.22      | 24               | 28     |
| 0.25      |                  | 32     |
| 0.32      | 22               | 40     |
| 0.5       | 20               | 60     |
| 0.75      |                  | 85     |
| 0.82      | 18               | 90     |
| 1.0       |                  | 108    |
| 1.3       | 16               | 135    |
| 1.5       |                  | 150    |
| 2.1       | 14               | 200    |
| 2.5       |                  | 200    |
| 3.3       | 12               | 275    |
| 4.0       |                  | 310    |
| 5.3       | 10               | 355    |
| 6.0       |                  | 360    |
| 8.4       | 8                | 370    |
| 10.0      |                  | 380    |

A crimp connection is a non-detachable electrical connection between a wire and a crimp contact produced with the crimp technology. Precise crimping dies are matched to the crimp barrel and the wire size and a defined deformation results in a reliable electrical connection. There are open barrels (stamped contacts) and closed crimp barrels (turned contacts).

The main advantages of crimp connections are:

- Efficient termination of contacts.
- Reproduceable electrical and mechanical figures by a constant crimp quality.

(A detailed description of the crimp technology can be found in our catalogue "tools").

The requirements for crimp connections are defined in DIN EN 60352-2.

An important point for the quality of a crimp connection is the achieved tensile strength of the termination. Measuring the tensile strength is a practible means for quality control purposes. Chart 2 below shows the required minimum tensile strength for open and closed barrels according to the wire size.

Cross reference AWG - mm²

The chart below allows a cross reference between American Wire Gauge (AWG) and metric wire sizes (mm²).

Chart 3

| AWG | Wire composition | Leiter-Ø | Wire size | AWG | Wire composition | Leiter-Ø | Wire size |
|-----|------------------|----------|-----------|-----|------------------|----------|-----------|
| 30  | 1 x 0.25         | 0.25 mm  | 0.05 mm²  | 20  | 1 x 0.81         | 0.81 mm  | 0.52 mm²  |
|     | 7 x 0.10         | 0.36 mm  | 0.06 mm²  |     | 7 x 0.32         | 0.97 mm  | 0.56 mm²  |
| 28  | 1 x 0.32         | 0.32 mm  | 0.08 mm²  |     | 19 x 0.20        | 1.02 mm  | 0.62 mm²  |
|     | 7 x 0.13         | 0.38 mm  | 0.09 mm²  | 18  | 1 x 1.02         | 1.02 mm  | 0.79 mm²  |
| 26  | 1 x 0.40         | 0.40 mm  | 0.13 mm²  |     | 19 x 0.25        | 1.27 mm  | 0.96 mm²  |
|     | 7 x 0.16         | 0.48 mm  | 0.14 mm²  | 16  | 19 x 0.29        | 1.44 mm  | 1.23 mm²  |
|     | 19 x 0.10        | 0.51 mm  | 0.15 mm²  | 14  | 19 x 0.36        | 1.80 mm  | 1.95 mm²  |
| 24  | 1 x 0.51         | 0.51 mm  | 0.21 mm²  | 12  | 19 x 0.46        | 2.29 mm  | 3.09 mm²  |
|     | 7 x 0.20         | 0.61 mm  | 0.23 mm²  | 10  | 37 x 0.40        | 3.10 mm  | 4.60 mm²  |
|     | 19 x 0.13        | 0.64 mm  | 0.24 mm²  | 8   | 133 x 0.29       | 4.0 mm   | 8.80 mm²  |
| 22  | 1 x 0.64         | 0.64 mm  | 0.33 mm²  | 6   | 133 x 0.36       | 5.5 mm   | 13.5 mm²  |
|     | 7 x 0.25         | 0.76 mm  | 0.36 mm²  |     |                  |          |           |
|     | 19 x 0.16        | 0.81 mm  | 0.38 mm²  |     |                  |          |           |

It has to be noted that wires of the same AWG number but with different composition have slightly different mm².

Chart 4: Composition and Dimensions of Copper Wires

| Wire Size            | Wire Composition | Wire diameter |
|----------------------|------------------|---------------|
| 0.09 mm <sup>2</sup> | 12 x 0.10        | 0.48 mm       |
| 0.14 mm <sup>2</sup> | 18 x 0.10        | 0.50 mm       |
| 0.25 mm <sup>2</sup> | 14 x 0.15        | 0.70 mm       |
| 0.34 mm <sup>2</sup> | 7 x 0.25         | 0.78 mm       |
| 0.5 mm <sup>2</sup>  | 16 x 0.20        | 1.0 mm        |
| 0.75 mm <sup>2</sup> | 24 x 0.20        | 1.2 mm        |
| 1.0 mm <sup>2</sup>  | 32 x 0.20        | 1.4 mm        |
| 1.5 mm <sup>2</sup>  | 30 x 0.25        | 1.6 mm        |
| 2.5 mm <sup>2</sup>  | 35 x 0.30        | 2.2 mm        |
| 4.0 mm <sup>2</sup>  | 56 x 0.30        | 2.8 mm        |
| 6.0 mm <sup>2</sup>  | 19 x 0.64        | 3.4 mm        |
| 10 mm <sup>2</sup>   | 19 x 0.80        | 4.3 mm        |

Current carrying capacity

The current carrying capacity of a connector is shown by a derating curve. The curve shows the currents that the connector can carry continuously and simultaneously through all its contacts. The curve is determined by testing following the standard DIN EN 60512. The upper temperature is limited by the contact and insulation material used . The sum of the ambient temperature and the temperature created by the current flow may not exceed the upper temperature. This means that the current carrying capacity has no fixed value but decreases with increasing ambient temperatures.

As a general example it can be said that a given connector which can carry 16A through all its contacts at 40°C ambient temperature can carry less, e.g. 12A, at an ambient temperature of 80°C. On the other hand it is often the case that not all contacts carry the whole rated current, which means that some single contacts may carry a higher current than that according to the derating curve. These currents have to be defined by testing.

Diagram 3: Typical derating curve

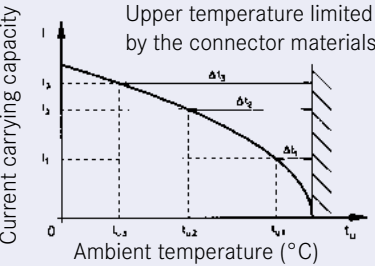
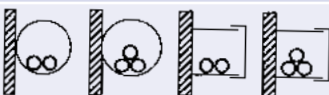
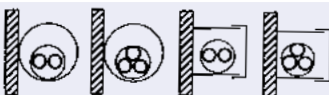


Chart 5: Current carrying capacity of copper wires in (A)

| Installation type                                                                                                                                    | Wire size (mm2) | 0.25 | 0.34 | 0.5 | 0.75 | 1    | 1.5  | 2.5 | 4  | 6  | 10 |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|------|------|-----|------|------|------|-----|----|----|----|
| <br>B1 Wires in conduits and installation channels                | -               | -    | -    | 7.6 | 10.4 | 13.5 | 18.3 | 25  | 32 | 44 |    |
| <br>B2 Cables and conductors in conduits or installation channels | -               | -    | -    | -   | 9.6  | 12   | 16.5 | 23  | 29 | 40 |    |
| <br>C Cables and conductors along walls                           | 4.0             | 5.0  | 7.1  | 9.1 | 11.7 | 15.2 | 21   | 28  | 36 | 50 |    |
| <br>E Cables and conductors on plank                              | 4.0             | 5.0  | 7.1  | 9.1 | 11.5 | 16.1 | 22   | 30  | 37 | 52 |    |

Description according to DIN EN 60204 for PVC insulated copper wires with a working temperature of +40C. For other requirements,

such as for other temperatures, mountings, or wires corresponding correction factors are used (see next page).

Reduction values

The values in chart 5 are based on an ambient temperature of 40 °C. For other ambient temperatures the values have to be adjusted using the correction values of chart 6 below.

For installations with many cables and conductors under load the current carrying capacity is reduced according to the two following charts 7 and 8.

Chart 6

| Ambient temperature (°C) | Correction value |
|--------------------------|------------------|
| 30                       | 1.15             |
| 35                       | 1.03             |
| 40                       | 1.00             |
| 45                       | 0.91             |
| 50                       | 0.82             |
| 55                       | 0.71             |
| 60                       | 0.58             |

Chart 7: Reduction values for accumulated conductors

| Installation type                                     | Number of cables and conductors / pairs under load |      |      |      |
|-------------------------------------------------------|----------------------------------------------------|------|------|------|
|                                                       | 2                                                  | 4    | 6    | 9    |
| Threephase cable and conductor                        |                                                    |      |      |      |
| B1 and B2                                             | 0.80                                               | 0.85 | 0.87 | 0.86 |
| C                                                     | 0.65                                               | 0.75 | 0.78 | 0.76 |
| E-one row                                             | 0.57                                               | 0.72 | 0.75 | 0.72 |
| E-multi row                                           | 0.50                                               | 0.70 | 0.73 | 0.88 |
| DC conductor (pair), independent of installation type | 1.0                                                | 0.76 | 0.64 | 0.43 |

Chart 8: Reduction values for multicore cable and conductors up to 10mm<sup>2</sup>

| Number of conductors (pairs) under load | AC (conductor > 1 mm <sup>2</sup> ) | DC (Pairs 0.2 to 0.75 mm <sup>2</sup> ) |
|-----------------------------------------|-------------------------------------|-----------------------------------------|
| 5                                       | 0.75                                | 0.52                                    |
| 7                                       | 0.65                                | 0.45                                    |
| 10                                      | 0.55                                | 0.39                                    |
| 24                                      | 0.40                                | 0.27                                    |

Conductors of control circuits generally do not need a reduction.

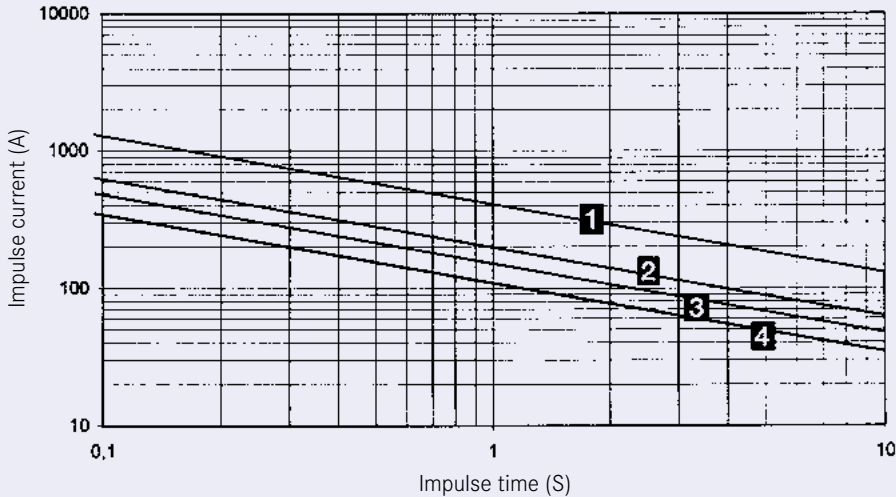
Impulse current carrying capacity

A surge can happen to a connector and its contacts by an impulse current, e.g. through a short circuit in the system or by switching operations. The short-timed high current heat cannot be transferred outside fast enough so the contacts are stressed by the high temperature which in the worst case can lead to a local weld.

The robust design of our connectors prevents most damage by impulse currents.

The diagram 4 below can be used as a guideline.

Chart 4: Impulse current carrying capacity of single contacts



| Curve No. | Connector style                          | Curve No. | Connector style                          |
|-----------|------------------------------------------|-----------|------------------------------------------|
| 1         | heavy mate® E or A with screw contact    | 3         | heavy mate® S with stamped crimp contact |
| 2         | heavy mate® E with stamped crimp contact | 4         | heavy mate® D with stamped crimp contact |



| Voltage grading of connectors                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|-----|
| General                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |
| Clearances and creepage distances are the base for voltage grading of connectors. Valuation and dimensioning of clearances and creepage distances have changed since the introduction of insulation coordination.                                                              |  | The following standards apply for this:                                                                                                                                                                                                                                                                                                                                                                                                           |     |     |     |
|                                                                                                                                                                                                                                                                                |  | IEC 60664-1 /10.92<br>Insulation coordination for equipment within low-voltage systems                                                                                                                                                                                                                                                                                                                                                            |     |     |     |
| Insulation coordination comprises the selection of the electrical insulation performances of the equipment, taking into account the expected use and its environment.                                                                                                          |  | DIN VDE 0110-1 /4.97<br>Isolationskoordination für elektrische Betriebsmittel in Niederspannungsanlagen                                                                                                                                                                                                                                                                                                                                           |     |     |     |
| Clearances                                                                                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |
| The clearance is the shortest distance in air between two conductive parts. An important point for the dimensioning of clearances is the determination of the overvoltage category. The above standard specifies the possible overvoltages into the four following categories: |  | Overvoltage category III<br>Equipment intended for the use in installtions or parts of it in which lightning overvoltages do not need to be considered, however switching overvoltages generated by the euipment, and for cases where the reliability and the availability of the equipment or its dependent circuits are subject to special requirements. Examples are protecting means, switches and sockets.                                   |     |     |     |
| Overvoltage category I<br>Equipment intended for the use in appliances or parts of installations in which no overvoltage can occur.<br>Examples are low-voltage equipments.                                                                                                    |  | Overvoltage category IV<br>Equipment intended for the use in installations or parts of it in which lightning overvoltage has to be considered.<br>Examples are electricity meters, overcurrent protection switches.                                                                                                                                                                                                                               |     |     |     |
| Overvoltage category II<br>Equipment intended for the use in installations or parts of it in which lightning overvoltages do not need to be considered, but switching overvoltages generated by the equipment do need to be considered. Examples are household appliances.     |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |
| Once the overvoltage category has been defined the rated impulse withstand voltage can be selected for the equipment based on the nominal voltage of the supply system and the overvoltage category using chart 9 below:                                                       |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |
| Chart 9                                                                                                                                                                                                                                                                        |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |
| Nominal voltage of the supply system in V<br>(based on IEC 60038)                                                                                                                                                                                                              |  | Rated impulse voltage in kV for overvoltage category                                                                                                                                                                                                                                                                                                                                                                                              |     |     |     |
| Three phase systems                                                                                                                                                                                                                                                            |  | IV                                                                                                                                                                                                                                                                                                                                                                                                                                                | III | II  | I   |
| 230/400 277/480                                                                                                                                                                                                                                                                |  | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 4   | 2.5 | 1.5 |
| 400/690                                                                                                                                                                                                                                                                        |  | 8                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 6   | 4   | 2.5 |
| 1000                                                                                                                                                                                                                                                                           |  | 12                                                                                                                                                                                                                                                                                                                                                                                                                                                | 8   | 6   | 4   |
| After the rated impulse withstand voltage has been selected the pollution degree must be defined taking the expected pollution around the equipment into account.<br>The following four degrees of pollution are established:                                                  |  |  It has to be noted that for a connector or plug and socket devise with a degree of protection of min. IP54 the parts inside the enclosure may be dimensioned for a lower pollution degree. This also applies to mated connectors which enclosure is ensured through the connector housing and which may only be disengaged for test and maintenance purposes. |     |     |     |
| Pollution degree 1<br>No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.                                                                                                                                                               |  | When impulse withstand voltage and the pollution degree are defined the minimum clearances can be selected from chart 10.                                                                                                                                                                                                                                                                                                                         |     |     |     |
| Pollution degree 2<br>Only non-conductive pollution occurs except occasionally a temporary conductivity caused by condensation is to be expected.                                                                                                                              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |
| Pollution degree 3<br>Conductive pollution occurs or dry non-conductive pollution occurs which becomes conductive due to condensation which is to be expected.                                                                                                                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |
| Pollution degree 4<br>The pollution generates persistent conductivity caused by conductive dust or by rain or snow.                                                                                                                                                            |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |     |     |

| Chart 10                                                                                                                                                                                                                                                                                                                |                                                              |      |     |                                                                                                                                                                                                                                                                                                                                           |                            |      |      |      |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|------|------|------|
| Impulse withstand voltage in kV                                                                                                                                                                                                                                                                                         | Minimum clearances in air in mm up to 2000 m above sea level |      |     |                                                                                                                                                                                                                                                                                                                                           |                            |      |      |      |
|                                                                                                                                                                                                                                                                                                                         | Case A (non homogeneous field)                               |      |     |                                                                                                                                                                                                                                                                                                                                           | Case B (homogeneous field) |      |      |      |
|                                                                                                                                                                                                                                                                                                                         | Pollution degree                                             |      |     |                                                                                                                                                                                                                                                                                                                                           | Pollution degree           |      |      |      |
|                                                                                                                                                                                                                                                                                                                         | 1                                                            | 2    | 3   | 4                                                                                                                                                                                                                                                                                                                                         | 1                          | 2    | 3    | 4    |
| 0.33                                                                                                                                                                                                                                                                                                                    | 0.01                                                         | 0.2  | 0.8 | 1.6                                                                                                                                                                                                                                                                                                                                       | 0.01                       | 0.2  | 0.8  | 1.6  |
| 0.40                                                                                                                                                                                                                                                                                                                    | 0.02                                                         |      |     |                                                                                                                                                                                                                                                                                                                                           | 0.02                       |      |      |      |
| 0.50                                                                                                                                                                                                                                                                                                                    | 0.04                                                         |      |     |                                                                                                                                                                                                                                                                                                                                           | 0.04                       |      |      |      |
| 0.60                                                                                                                                                                                                                                                                                                                    | 0.06                                                         |      |     |                                                                                                                                                                                                                                                                                                                                           | 0.06                       |      |      |      |
| 0.80                                                                                                                                                                                                                                                                                                                    | 0.10                                                         |      |     |                                                                                                                                                                                                                                                                                                                                           | 0.1                        |      |      |      |
| 1.0                                                                                                                                                                                                                                                                                                                     | 0.15                                                         | 0.25 | 1.0 |                                                                                                                                                                                                                                                                                                                                           | 0.15                       | 0.3  |      |      |
| 1.2                                                                                                                                                                                                                                                                                                                     | 0.25                                                         |      |     |                                                                                                                                                                                                                                                                                                                                           | 0.2                        |      |      |      |
| 1.5                                                                                                                                                                                                                                                                                                                     | 0.5                                                          |      |     |                                                                                                                                                                                                                                                                                                                                           | 0.5                        | 0.3  | 0.3  | 0.45 |
| 2.0                                                                                                                                                                                                                                                                                                                     | 1.0                                                          | 1.0  | 1.0 | 0.45                                                                                                                                                                                                                                                                                                                                      | 0.45                       |      |      |      |
| 2.5                                                                                                                                                                                                                                                                                                                     | 1.5                                                          | 1.5  | 1.5 | 2                                                                                                                                                                                                                                                                                                                                         | 0.6                        | 0.6  |      |      |
| 3.0                                                                                                                                                                                                                                                                                                                     | 2                                                            | 2    | 2   |                                                                                                                                                                                                                                                                                                                                           | 0.8                        | 0.8  |      |      |
| 4.0                                                                                                                                                                                                                                                                                                                     | 3                                                            | 3    | 3   | 3                                                                                                                                                                                                                                                                                                                                         | 1.2                        | 1,2  | 1.2  |      |
| 5.0                                                                                                                                                                                                                                                                                                                     | 4                                                            | 4    | 4   | 4                                                                                                                                                                                                                                                                                                                                         | 1.5                        | 1.5  | 1.5  |      |
| 6.0                                                                                                                                                                                                                                                                                                                     | 5.5                                                          | 5.5  | 5.5 | 5.5                                                                                                                                                                                                                                                                                                                                       | 2                          | 2    | 2    | 2    |
| 8.0                                                                                                                                                                                                                                                                                                                     | 8                                                            | 8    | 8   | 8                                                                                                                                                                                                                                                                                                                                         | 3                          | 3    | 3    | 3    |
| 10                                                                                                                                                                                                                                                                                                                      | 11                                                           | 11   | 11  | 11                                                                                                                                                                                                                                                                                                                                        | 3.5                        | 3.5  | 3.5  | 3.5  |
| 12                                                                                                                                                                                                                                                                                                                      | 14                                                           | 14   | 14  | 14                                                                                                                                                                                                                                                                                                                                        | 4.5                        | 4.5  | 4.5  | 4.5  |
| 15                                                                                                                                                                                                                                                                                                                      | 18                                                           | 18   | 18  | 18                                                                                                                                                                                                                                                                                                                                        | 5.5                        | 5.5  | 5.5  | 5.5  |
| 20                                                                                                                                                                                                                                                                                                                      | 25                                                           | 25   | 25  | 25                                                                                                                                                                                                                                                                                                                                        | 8                          | 8    | 8    | 8    |
| 25                                                                                                                                                                                                                                                                                                                      | 33                                                           | 33   | 33  | 33                                                                                                                                                                                                                                                                                                                                        | 10                         | 10   | 10   | 10   |
| 30                                                                                                                                                                                                                                                                                                                      | 40                                                           | 40   | 40  | 40                                                                                                                                                                                                                                                                                                                                        | 12.5                       | 12.5 | 12.5 | 12,5 |
| 40                                                                                                                                                                                                                                                                                                                      | 60                                                           | 60   | 60  | 60                                                                                                                                                                                                                                                                                                                                        | 17                         | 17   | 17   | 17   |
| 50                                                                                                                                                                                                                                                                                                                      | 75                                                           | 75   | 75  | 75                                                                                                                                                                                                                                                                                                                                        | 22                         | 22   | 22   | 22   |
| 60                                                                                                                                                                                                                                                                                                                      | 90                                                           | 90   | 90  | 90                                                                                                                                                                                                                                                                                                                                        | 27                         | 27   | 27   | 27   |
| 80                                                                                                                                                                                                                                                                                                                      | 130                                                          | 130  | 130 | 130                                                                                                                                                                                                                                                                                                                                       | 35                         | 35   | 35   | 35   |
| 100                                                                                                                                                                                                                                                                                                                     | 170                                                          | 170  | 170 | 170                                                                                                                                                                                                                                                                                                                                       | 45                         | 45   | 45   | 45   |
| When defining the minimum clearances for connectors generally the values of the inhomogeneous field can be chosen or the required clearance has to be defined by a voltage test.                                                                                                                                        |                                                              |      |     |                                                                                                                                                                                                                                                                                                                                           |                            |      |      |      |
| Creepage distances                                                                                                                                                                                                                                                                                                      |                                                              |      |     |                                                                                                                                                                                                                                                                                                                                           |                            |      |      |      |
| The creepage distance is the shortest distance along the surface of the insulating material between two conductive parts.<br>For the dimensioning of the creepage distance the following factors are taken into account: the rated voltage, the pollution degree and the tracking formation of the insulating material. |                                                              |      |     | The materials are separated into four groups according to their CTI values (Comparative Tracking Index):<br>Material group I                      600 ≤ CTI<br>Material group II                      400 ≤ CTI < 600<br>Material group IIIa                    175 ≤ CTI < 400<br>Material group IIIb                    100 ≤ CTI < 175 |                            |      |      |      |
| The minimum creepage distances can be selected from chart 11.                                                                                                                                                                                                                                                           |                                                              |      |     |                                                                                                                                                                                                                                                                                                                                           |                            |      |      |      |

| Chart 11                                 |                              |                |                  |      |      |      |                |                  |      |      |                |                  |      |      |  |
|------------------------------------------|------------------------------|----------------|------------------|------|------|------|----------------|------------------|------|------|----------------|------------------|------|------|--|
| U-eff<br>Rated<br>vol-<br>tage<br>U in V | Min. creepage distance in mm |                |                  |      |      |      |                |                  |      |      |                |                  |      |      |  |
|                                          | Printed<br>circuits          |                | Other devices    |      |      |      |                |                  |      |      |                |                  |      |      |  |
|                                          |                              |                |                  |      |      |      |                |                  |      |      |                |                  |      |      |  |
|                                          | Pollution<br>degree          |                | Pollution degree |      |      |      |                | Pollution degree |      |      |                | Pollution degree |      |      |  |
|                                          |                              |                | 1                | 2    |      |      |                | 3                |      |      |                | 4                |      |      |  |
| 1                                        | 2                            | Material group |                  |      |      |      | Material group |                  |      |      | Material group |                  |      |      |  |
| 2)                                       | 3)                           | 2)             | I                | II   | IIIa | IIIb | I              | II               | IIIa | IIIb | I              | II               | IIIa | IIIb |  |
| 10                                       | 0.025                        | 0.04           | 0.08             | 0.4  | 0.4  | 0.4  |                | 1                | 1    | 1    |                | 1.6              | 1.6  | 1.6  |  |
| 12.5                                     | 0.025                        | 0.04           | 0.09             | 0.42 | 0.42 | 0.42 |                | 1.05             | 1.05 | 1.05 |                | 1.6              | 1.6  | 1.6  |  |
| 16                                       | 0.025                        | 0.04           | 0.1              | 0.45 | 0.45 | 0.45 |                | 1.1              | 1.1  | 1,1  |                | 1.6              | 1.6  | 1.6  |  |
| 20                                       | 0,025                        | 0.04           | 0.11             | 0.48 | 0.48 | 0.48 |                | 1.2              | 1.2  | 1.2  |                | 1.6              | 1.6  | 1.6  |  |
| 25                                       | 0,025                        | 0.04           | 0.125            | 0.5  | 0.5  | 0.5  |                | 1.25             | 1.25 | 1.25 |                | 1.7              | 1.7  | 1.7  |  |
| 32                                       | 0.025                        | 0.04           | 0.14             | 0.53 | 0.53 | 0.53 |                | 1.3              | 1.3  | 1.3  |                | 1.8              | 1.8  | 1.8  |  |
| 40                                       | 0.025                        | 0.04           | 0.16             | 0.56 | 0.8  | 1.1  |                | 1.4              | 1.6  | 1.8  |                | 1.9              | 2.4  | 3    |  |
| 50                                       | 0.025                        | 0.04           | 0.18             | 0.6  | 0.85 | 1.2  |                | 1.5              | 1.7  | 1.9  |                | 2                | 2.5  | 3.2  |  |
| 63                                       | 0.04                         | 0.063          | 0.2              | 0.63 | 0.9  | 1.25 |                | 1,6              | 1.8  | 2    |                | 2.1              | 2.6  | 3.4  |  |
| 80                                       | 0.063                        | 0.1            | 0.22             | 0.67 | 0.95 | 1.3  |                | 1.7              | 1.9  | 2.1  |                | 2.2              | 2.8  | 3.6  |  |
| 100                                      | 0.1                          | 0.16           | 0.25             | 0.71 | 1    | 1.4  |                | 1.8              | 2    | 2.2  |                | 2.4              | 3.0  | 3.8  |  |
| 125                                      | 0.16                         | 0.25           | 0.28             | 0.75 | 1.05 | 1.5  |                | 1.9              | 2.1  | 2.4  |                | 2.5              | 3.2  | 4    |  |
| 160                                      | 0.25                         | 0.4            | 0.32             | 0.8  | 1.1  | 1.6  |                | 2                | 2.2  | 2.5  |                | 3.2              | 4    | 5    |  |
| 200                                      | 0.4                          | 0.63           | 0.42             | 1    | 1.4  | 2    |                | 2.5              | 2.8  | 3.2  |                | 4                | 5    | 6.3  |  |
| 250                                      | 0.56                         | 1              | 0.56             | 1.25 | 1.8  | 2.5  |                | 3.2              | 3.6  | 4    |                | 5                | 6.3  | 8    |  |
| 320                                      | 0.75                         | 1.6            | 0.75             | 1.6  | 2.2  | 3.2  |                | 4                | 4.5  | 5    |                | 6.3              | 8    | 10   |  |
| 400                                      | 1                            | 2              | 1                | 2    | 2.8  | 4    |                | 5                | 5.6  | 6.3  |                | 8                | 10   | 12.5 |  |
| 500                                      | 1.3                          | 2.5            | 1.3              | 2.5  | 3.6  | 5    |                | 6.3              | 7.1  | 8.0  |                | 10               | 12.5 | 16   |  |
| 630                                      | 1.8                          | 3.2            | 1.8              | 3.2  | 4.5  | 6.3  |                | 8                | 9    | 10   |                | 12.5             | 16   | 20   |  |
| 800                                      | 2.4                          | 4              | 2.4              | 4    | 5.6  | 8    |                | 10               | 11   | 12.5 |                | 16               | 20   | 25   |  |
| 1000                                     | 3.2                          | 5              | 3.2              | 5    | 7.1  | 10   |                | 12.5             | 14   | 16   |                | 20               | 25   | 32   |  |
| 1250                                     |                              |                | 4.2              | 6.3  | 9    | 12.5 |                | 16               | 18   | 20   |                | 25               | 32   | 40   |  |
| 1600                                     |                              |                | 5.6              | 8    | 11   | 16   |                | 20               | 22   | 25   |                | 32               | 40   | 50   |  |
| 2000                                     |                              |                | 7.5              | 10   | 14   | 20   |                | 25               | 28   | 32   |                | 40               | 50   | 63   |  |
| 2500                                     |                              |                | 10               | 12.5 | 18   | 25   |                | 32               | 36   | 40   |                | 50               | 63   | 80   |  |
| 3200                                     |                              |                | 12.5             | 16   | 22   | 32   |                | 40               | 45   | 50   |                | 63               | 80   | 100  |  |
| 4000                                     |                              |                | 16               | 20   | 28   | 40   |                | 50               | 56   | 63   |                | 80               | 100  | 125  |  |
| 5000                                     |                              |                | 20               | 25   | 36   | 50   |                | 63               | 71   | 80   |                | 100              | 125  | 160  |  |
| 6300                                     |                              |                | 25               | 32   | 45   | 63   |                | 80               | 90   | 100  |                | 125              | 160  | 200  |  |
| 8000                                     |                              |                | 32               | 40   | 56   | 80   |                | 100              | 110  | 125  |                | 160              | 200  | 250  |  |
| 10000                                    |                              |                | 40               | 50   | 71   | 100  |                | 125              | 140  | 160  |                | 200              | 250  | 320  |  |

Connectors in this catalogue are allocated to fixed rated voltages which apply to the machine building industry. In case of other applications the above chart can be used to determine other rated voltages.

Degree of protection

Electrical connector devices have to be protected for safety reasons from outside influences like dust, foreign objects, direct contact, moisture and water. This protection is provided on industrial connectors by the housing latching devices and sealed cable entries. The degree of protection depends on the type of intended use. The standard IEC 60529 and/or DIN EN 60529 has specified the degree of protection and divided them into several classes.

The degree of protection is indicated in the following way: IP65  
Code letters (Internat. Protection) \_\_\_\_\_  
1st charact. numeral (degree of protection against access to hazardous parts and against solid foreign objects) \_\_\_\_\_  
2nd charact. numeral (degree of protection against ingress of water) \_\_\_\_\_  
The following charts 12 an13 give an overview about all protection degrees.

| Chart 12                   |                                                                                                                          |                                                                                                                                                                                                            | Chart 13                   |                                                                                  |                                                                                                                                                                                                                                                        |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1st<br>charact.<br>numeral | Brief description                                                                                                        | Definition                                                                                                                                                                                                 | 2nd<br>charact.<br>numeral | Brief description                                                                | Definition                                                                                                                                                                                                                                             |
| 0                          | Non-protected                                                                                                            | —                                                                                                                                                                                                          | 0                          | Non-protected                                                                    | —                                                                                                                                                                                                                                                      |
| 1                          | Protected against access to hazardous parts with the back of a hand. Protected against solid foreign objects of ≥50mm Ø. | The probe, sphere of 50mm Ø, shall not fully penetrate and shall have adequate clearance from hazardous parts.                                                                                             | 1                          | Protected against vertically falling water drops                                 | Vertically falling drops shall have no harmful effects.                                                                                                                                                                                                |
| 2                          | Protected against access to hazardous parts with a finger. Protected against solid foreign objects of ≥12,5mm Ø.         | The jointed test finger of 12mm Ø, 80mm length, shall have adequate clearance from hazardous parts. The probe, sphere of 12,5mm Ø, shall not fully penetrate.                                              | 2                          | Protected against vertically falling water drops when enclosure tilted up to 15° | Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angel up to 15° .                                                                                                                                           |
| 3                          | Protected against access to hazardous parts with a tool. Protected against solid foreign objects of ≥2,5mm Ø.            | The probe of 2,5mm Ø shall not penetrate at all.                                                                                                                                                           | 3                          | Protected against spraying water                                                 | Water sprayed at any angle up to 60° shall have no harmful effects.                                                                                                                                                                                    |
| 4                          | Protected against access to hazardous parts with a wire. Protected against solid foreign objects of ≥1mm Ø.              | The probe of 1mm Ø shall not penetrate at all.                                                                                                                                                             | 4                          | Protected against splashing water                                                | Water splashed against the enclosure from any direction shall have no harmful effects.                                                                                                                                                                 |
| 5                          | Protected against access to hazardous parts with a wire. Dust-protected.                                                 | The probe of 1mm Ø shall not penetrate. Intrusion of dust is not totally prevented, but dust shall not penetrate in a quantity to interfere with satisfactory operation of the device or to impair safety. | 5                          | Protected against water jets                                                     | Water projected in jets against the enclosure from any direction shall have no harmful effects.                                                                                                                                                        |
| 6                          | Protected against access to hazardous parts with a wire Dust-tight.                                                      | The probe of 1mm Ø shall not penetrate. No intrusion of dust.                                                                                                                                              | 6                          | Protected against powerful water jets                                            | Water projected in powerful jets against the enclosure from any direction shall have no harmful effects.                                                                                                                                               |
|                            |                                                                                                                          |                                                                                                                                                                                                            | 7                          | Protected against the effects of temporary immersion in water                    | Intrusion of water in quantities causing harmful effects shall not be possible when the enclosure is temporaliy immersed in water for 30 min. in 1m depth.                                                                                             |
|                            |                                                                                                                          |                                                                                                                                                                                                            | 8                          | Protected against the effects of continous immersion in water                    | Intrusion of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user but which are more severe than for numeral 7. |
|                            |                                                                                                                          |                                                                                                                                                                                                            | 9K <sup>1)</sup>           | Protected against water during high pressure/steam jet cleaning                  | Water projected in powerful jets with high pressure and heat against the enclosure from any direction shall have no harmful effects.                                                                                                                   |

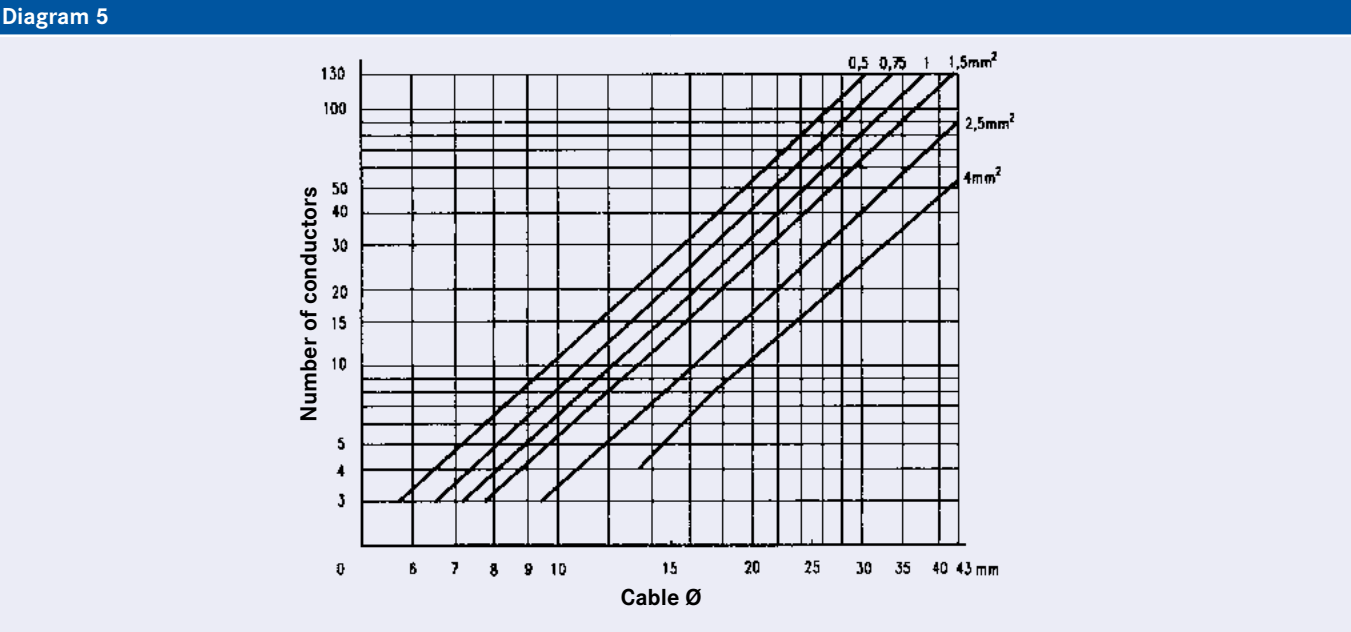
<sup>1)</sup> Remark: Numeral acc. to DIN 40050 part 9, vehicles IP code, IP69K is not a part of DIN EN 60 529 or IEC 60 529, is speciflicated in DIN 40 050-9



|                                                                                                                                                                                                                                                                                                      |                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cable</b>                                                                                                                                                                                                                                                                                         |                                                                                                                                         |
| For the termination of all Amphenol-industrial connectors we recommend the use of commercially available high flexible cable acc. to VDE or other local specifications. Our connectors are designed to fit these cables especially as far as number of conductors and cable diameters are concerned. | When selecting cables care must be taken that the cables do not affect (solvent) the connector or preserve an existing fire resistance. |

|                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sealing</b>                                                                                                                                                                                   |
| The sealing of the cable entries of all Amphenol-industrial connectors is with gland bushings. All sealings are made from Neoprene which has a good resistance against grease, oil and gasoline. |

| Selection of gland bushings                                                                                                                                                                                                                                                      |                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Beside glands with a fixed inside diameter which equals the number, there are also glands with variable inside diameters available (so-called onion glands). The inside diameter of these glands can be adjusted to the outside cable diameter by cutting out the smaller rings. | The selection of the appropriate gland bushing depends on the cable diameter (cable composition) can be made using the following diagram 5 (see page 309). |



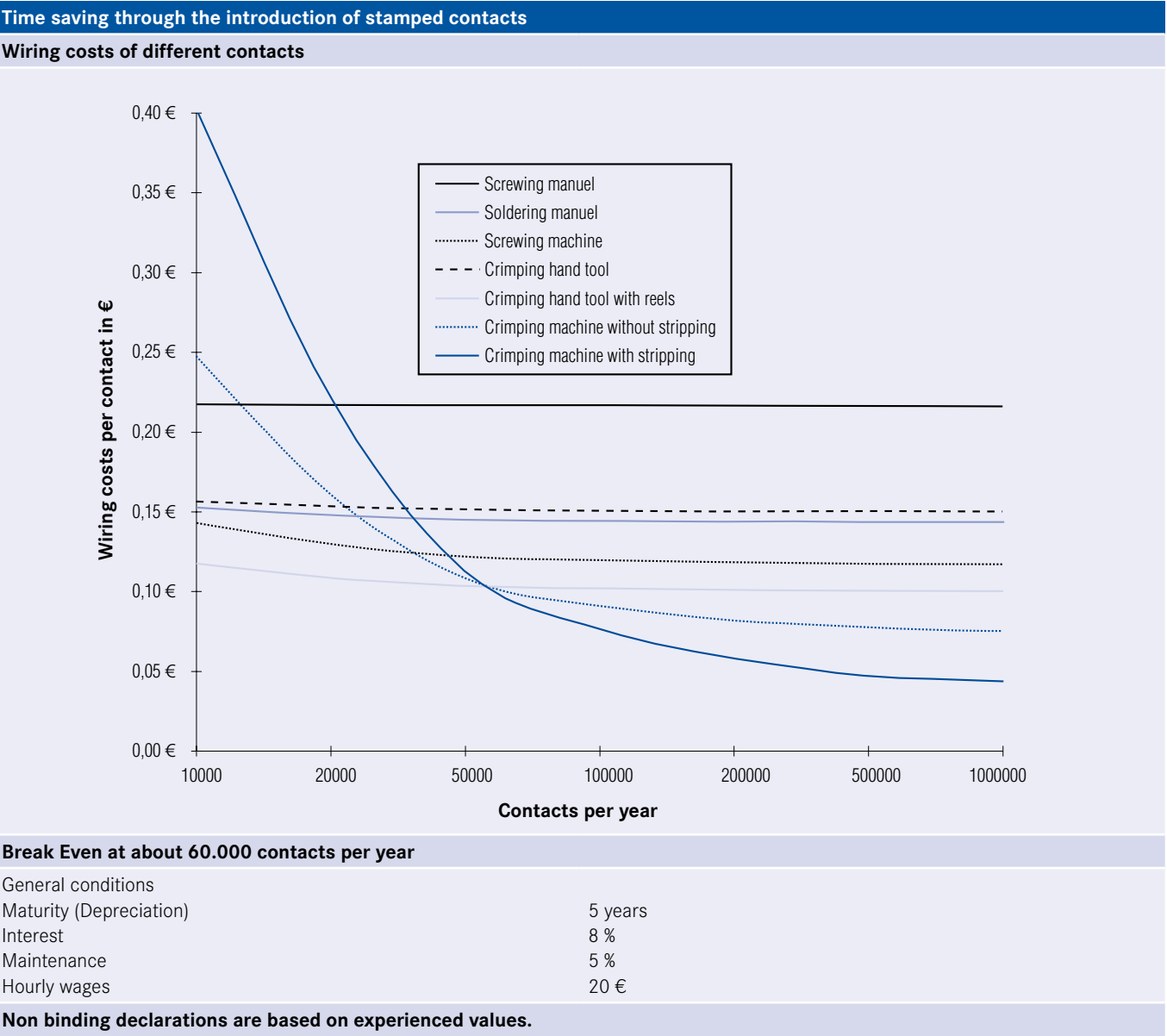
|                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>American Wire Gauge (AWG)</b>                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Contact</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| System of numerical designations for wire sizes, based on specified ranges of cross-sectional areas.<br>Starts with 4/0 (000) at the largest size, going to 3/0, 2/0, 1/0, 1, 2, and up to 40 and beyond for the smallest size. A step of one AWG number corresponds to a reduction of cross-sectional area of appr. 20 %.                                                                                                                             | The conductive element in a connector which mates with a corresponding element to provide an electrical path.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Attenuation</b>                                                                                                                                                                                                                                                                                                                                                                                                                                     | <b>Contact resistance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| A reduction of power. Occurs naturally when waves travel through lines, wave guides, or media such as air or water. Is produced additionally by imperfections in electrical or optical connections (attenuation in fibre optics), e. g. contact resistance, mismatch, etc.                                                                                                                                                                             | The electrical resistance of a mated set of contacts under specified conditions. Tested according to tests 2a, 2b, 2c, of IEC 60 512 -2/ DIN EN 60 512-2.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Bulkhead connector</b>                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Contact size</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Connector designed to be inserted into a panel cutout from the rear of the panel, thus forming part of the barrier between two spaces. Back-mounted.                                                                                                                                                                                                                                                                                                   | The designation used to differentiate one contact from another. It may be denoted by one of the following numbering systems: <ul style="list-style-type: none"><li>• numbering system: assigned numbers used to denote the size of the contact and its related conductor accomodation (e. g. in AWG units),</li><li>• current rating system: the related current-carrying capacity is used to denote the size of the contact,</li><li>• cross-sectional area system: reference is made to the cross-sectional area of the maximum conductor accomodation to denote the size of the contact, e. g. in mm².</li></ul> |
| <b>Clearance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Creepage distance</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| The shortest distance in air between two conductive parts, see IEC 60664.                                                                                                                                                                                                                                                                                                                                                                              | The shortest distance along the surface of the insulating material between two conductive parts. The longer the distance, the less the risk of arc damage or tracking. Minimum creepage distances are specified according to the rated voltage and the applicable pollution degree and Comperative Tracking Index.                                                                                                                                                                                                                                                                                                  |
| <b>Climatic stability</b>                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Crimped connection</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| General term describing the behavior of components under various climatic conditions, e. g. high and low temperatures, tropical climate, high humidity, moist heat, fungus, atmospheric conditions (industrial atmosphere), reduced air pressure, etc. Climatic conditions for test purposes are explained in IEC 60068, DIN 46 040.                                                                                                                   | A solderless connection made by crimping. IEC 60352-2 / DIN IEC 60352 Part 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Connector</b>                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>Derating curve</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| A component which terminates conductors for the purpose of providing connection and disconnection to a suitable mating component which shall not be engaged or disengaged when live. Depending on the fastening to a cabinet, panel, rack etc. or a cable, they are classified as fixed or free connectors. A connector comprises one or more contacts and a housing which may have a separate connector insert and a separate outer housing or shell. | The method for determining derating is specified in IEC 60 512-3. Here the combination of ambient temperature (Tu) and the current (I) leading to the same maximum allowable temperature (Tb) at the hottest point of the connector are plotted.                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Connector housing</b>                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>DIN</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| The part of a connector into which the insert and the contacts are assembled. It may function as part of the locking mechanism.                                                                                                                                                                                                                                                                                                                        | <b>Deutsches Institut für Normung.</b> A German standards organization.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Connector insert</b>                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Electromagnetic interference (EMI)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| An insulating element designed to support and position contacts in a connector housing.                                                                                                                                                                                                                                                                                                                                                                | General term describing the undesirable effects of the immission or emission of radio frequency fields.<br>In connectors electromagnetic interference is prevented by shielding. Shielded connectors normally provide means to connect the screens of attached cables.                                                                                                                                                                                                                                                                                                                                              |
| <b>Connector life</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Funnel entry (restricted entry C146 D series)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| The number of mating cycles prior to abrasion of the conductive contact surface and which does not result in a significant rise of the contact resistance. Tests according to test 9a of ICE 60512-5 / DIN EN 60512 Part 5.                                                                                                                                                                                                                            | Flared or widened entrance to a conductor barrel permitting easier insertion of the conductor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

| Insertion or withdrawal force                                                                                                                                                                                                                  | Material group                                                                                                                                                                                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The force required to fully insert or withdraw a set of mated connectors without the effect of coupling, locking or similar devices. The insertion force is usually greater than the withdrawal force.                                         | Classification of insulation materials according to their CTI values (CTI = Comparative Tracking Index)                                                                                                                                                                                                              |
| Insulation grip                                                                                                                                                                                                                                | Overvoltage category                                                                                                                                                                                                                                                                                                 |
| The area of a crimp contact that has been reshaped around the insulation of the conductor by compression during the crimping operation.                                                                                                        | A numeral defining a transient overvoltage condition. Overvoltage categories I, II, III and IV are used.                                                                                                                                                                                                             |
| Insulation resistance                                                                                                                                                                                                                          | Connector with braking capacity (CBC)                                                                                                                                                                                                                                                                                |
| The resistance of the insulation between two conductive elements, in particular, the resistance between two contacts or between a contact and a metallic housing or shield. Tested according to test 3a of IEC 60512-2 / DIN IEC 60512 Part 2. | A component which may be engaged or disengaged in normal use, when live or under load. Note: In the sense of this document the term - live- is used if contacts are under voltage not necessarily with a current flowing across the contacts. The term - load - is used if a current is flowing across the contacts. |
| Intermateable                                                                                                                                                                                                                                  | Rated current                                                                                                                                                                                                                                                                                                        |
| Two connectors are intermateable when they are capable of being connected electrically and mechanically but without regard to their performance and intermountability.                                                                         | A current value assigned by the manufacturer which the connector or PSD can carry continuously (without interruption) and simultaneously through all its contacts wired with the largest conductor preferably at an ambient temperature of 40 °C without the upper temperature being exceeded.                       |
| Locator                                                                                                                                                                                                                                        | Shield, shielding                                                                                                                                                                                                                                                                                                    |
| In a crimping tool the device used for positioning a crimp contact or terminal end.                                                                                                                                                            | Shielding of internal or external electric fields by means of a plane with a uniform electric potential, formed by metal shells or metallic layers on the inside or outside of plastic shells. The shield is normally connected to the shielding braid of the cable and/or chassis ground.                           |
| Locking lever                                                                                                                                                                                                                                  | Terminal block                                                                                                                                                                                                                                                                                                       |
| A mechanical locking device operated by actuating a lever, designed to hold two mated connectors together. Typically the lever can only be fully locked if the two connectors are correctly mated.                                             | An assembly of terminals in a housing or body of insulating material to facilitate interconnection between multiple conductors. Also called terminal strip or barrier blocks if the terminals are separated by an insulation barrier.                                                                                |
| Mating cycle                                                                                                                                                                                                                                   | Wire range                                                                                                                                                                                                                                                                                                           |
| One mating cycle comprises one insertion and one withdrawal operation. Term used in the definition of connector life.                                                                                                                          | The range of wire cross sections which is compatible with the dimensions the terminals of the contact (wire barrel). The wire range is expressed in mm2 or in AWG numbers.                                                                                                                                           |

| Stamped crimp contacts series C146, stripping length |             |         |                                      |                            |                     |                 |
|------------------------------------------------------|-------------|---------|--------------------------------------|----------------------------|---------------------|-----------------|
| Termination crimp [mm2]                              | Wire gauge  |         | Insulation diameter of the wire [mm] | Min. stripping length [mm] | Contact Part Number | Series          |
|                                                      | mm²         | AWG     |                                      |                            |                     |                 |
| 0.09 - 0.25                                          | 0.09 - 0.25 | 28 - 24 | 0.7 - 1.6                            | 2.3 + 0.4                  | N01 010 0130 2      | heavy mate® M   |
|                                                      |             |         |                                      |                            | N02 010 0130 2      | heavy mate® M   |
| 0.14 - 0.5                                           | 0.14        | 26      | 1.0 - 2.0                            | 3.0 + 0.5                  | N01 016 0003        | heavy mate® D/M |
|                                                      | 0.25        | 24-22   |                                      |                            | N02 016 0003        | heavy mate® D/M |
|                                                      | 0.5         | 20      |                                      |                            |                     |                 |
| 0.25 - 0.5                                           | 0.25        | 24-22   | 1.6 - 2.0                            | 2.3 + 0.4                  | N01 010 0131 2      | heavy mate® M   |
|                                                      | 0.5         | 20      |                                      |                            | N02 010 0131 2      | heavy mate® M   |
| 0.5 - 1.5                                            | 0.5         | 20      | 1.8 - 2.8                            | 3.5 + 1.0                  | N01 016 0002        | heavy mate® D/M |
|                                                      | 0.75        | 20 - 18 |                                      |                            | N02 016 0002        | heavy mate® D/M |
|                                                      | 1.0         | 18 - 16 |                                      |                            | N01 016 0015        | heavy mate® D   |
|                                                      | 1.5         | 16 - 15 |                                      |                            | N02 016 0015        | heavy mate® D   |
|                                                      |             |         |                                      |                            | N01 025 0001        | heavy mate® E/M |
| 1.5 - 2.5                                            |             |         | 2.5 - 3.5                            | 3.5 + 1.0                  | N02 025 0001        | heavy mate® E/M |
|                                                      | 1.5         | 16 - 15 |                                      |                            | N01 016 0005        | heavy mate® D/M |
|                                                      | 2.5         | 14      |                                      |                            | N02 016 0005        | heavy mate® D/M |
|                                                      |             |         |                                      |                            | N01 016 0016        | heavy mate® D   |
|                                                      |             |         |                                      |                            | N02 016 0016        | heavy mate® D   |
| 2.5 - 4.0                                            | 2.5         | 14      | 3.3 - 4.2                            | 3.5 + 1.0                  | N01 025 0010        | heavy mate® E/M |
|                                                      | 4.0         | 12      |                                      |                            | N02 025 0010        | heavy mate® E/M |
|                                                      |             |         |                                      |                            | N01 025 0043        | heavy mate® M   |
|                                                      |             |         |                                      |                            | N02 025 0043        | heavy mate® M   |



| Turned crimp contacts series heavy mate®, stripping length |                                       |                              |                             |                                       |                              |               |
|------------------------------------------------------------|---------------------------------------|------------------------------|-----------------------------|---------------------------------------|------------------------------|---------------|
| Termination crimp [mm²]                                    | Min. stripping length + Tolerance[mm] | Contact Part Number          | Series                      | Min. stripping length + Tolerance[mm] | Contact Part Number          | Series        |
| 1.6 (Contact with clip)                                    |                                       |                              | 2.5 (Contact with clip)     |                                       |                              |               |
| 0.14 - 0.37                                                | 8 + 1                                 | N01 016 0024<br>N02 016 0024 | heavy mate®<br>D/DD/F/K/M/Q |                                       |                              | heavy mate® M |
| 0.5                                                        | 8 + 1                                 | N01 016 0025<br>N02 016 0025 | heavy mate®<br>D/DD/F/K/M/Q | 7 + 1                                 | N01 025 0029<br>N02 025 0029 | heavy mate® M |
| 0.75 - 1.0                                                 | 8 + 1                                 | N01 016 0026<br>N02 016 0026 | heavy mate®<br>D/DD/F/K/M/Q | 7 + 1                                 | N01 025 0030<br>N02 025 0030 | heavy mate® M |
| 1.5                                                        | 8 + 1                                 | N01 016 0027<br>N02 016 0027 | heavy mate®<br>D/DD/F/K/M/Q | 7 + 1                                 | N01 025 0031<br>N02 025 0031 | heavy mate® M |
| 2.5                                                        | 6 + 1                                 | N01 016 0028<br>N02 016 0028 | heavy mate®<br>D/DD/F/K/M/Q | 7 + 1                                 | N01 025 0032<br>N02 025 0032 | heavy mate® M |
| 4.0                                                        |                                       |                              |                             | 7 + 1                                 | N01 025 0033<br>N02 025 0033 | heavy mate® M |
| 2.5 (Contact without clip)                                 |                                       |                              | 3.6 (Contact with clip)     |                                       |                              |               |
| 0.5                                                        | 7 + 1                                 | N01 025 0035<br>N02 025 0035 | heavy mate®<br>E/EE/F/Q     |                                       |                              |               |
| 0.75 - 1.0                                                 | 7 + 1                                 | N01 025 0036<br>N02 025 0036 | heavy mate®<br>E/EE/F/Q     |                                       |                              |               |
| 1.5                                                        | 7 + 1                                 | N01 025 0037<br>N02 025 0037 | heavy mate®<br>E/EE         | 10 + 1                                | N01 036 0004<br>N02 036 0004 | heavy mate® M |
| 2.5                                                        | 7 + 1                                 | N01 025 0038<br>N02 025 0038 | heavy mate®<br>E/EE         | 10 + 1                                | N01 036 0005<br>N02 036 0005 | heavy mate® M |
| 4.0                                                        | 7 + 1                                 | N01 025 0039<br>N02 025 0039 | heavy mate®<br>E/EE         | 10 + 1                                | N01 036 0001<br>N02 036 0001 | heavy mate® M |
| 6.0                                                        |                                       |                              |                             | 10 + 1                                | N01 036 0002<br>N02 036 0002 | heavy mate® M |
| 10.0                                                       |                                       |                              |                             | 10 + 1                                | N01 036 0003<br>N02 036 0003 | heavy mate® M |



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# International

## USA

Amphenol Sine Systems  
44724 Morley Drive  
48036 Clinton Township, MI  
Phone +1 586 913 8630

## Korea

Amphenol Daeshin  
558 Sosa, SongNea Bucheon-city  
Kyunggi-Do  
Korea 420-130  
Phone +82 32 610 3800

## Germany

Amphenol Tuchel Industrial GmbH  
August-Haeusser-Strasse 10  
74080 Heilbronn  
Phone +49 7131 929 0  
[www.amphenol-industrial.de](http://www.amphenol-industrial.de)

## Australia

Amphenol Australia PTY Limited  
22 Industry Boulevard  
Carrum Downs, 3201  
Victoria  
Australia  
Phone +61 3 8796 8888

## China

Amphenol Tuchel Electronics GmbH  
China Branch  
No. 6 Jianye Road  
Changzhou City 213125  
China  
Phone +86 519 85 60 86 20

More Amphenol companies can be  
found here: [www.amphenol.com](http://www.amphenol.com)



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