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# HDC Series Heavy Duty Connectors

**HDC Heavy duty connectors**

HDC Series is a high-density, heavy-duty connector designed for severe environmental conditions that can be encountered in rail transit and industrial automation applications.

Through the combination of different modules selected by the designer, the connector can handle different signal types such as power, signal, and data, without the need for separate connections.

HDC compact size ensures reliable connection in narrow spaces whilst greatly simplifying the wiring work and facilitating maintenance.

The waterproof and anti-corrosion characteristics of its metal shell ensure that HDC can work in harsh outdoor environments.

Conforming to IEC60664 and IEC61984 standards, HDC stands for safe and reliable connection while saving installation time and cost.



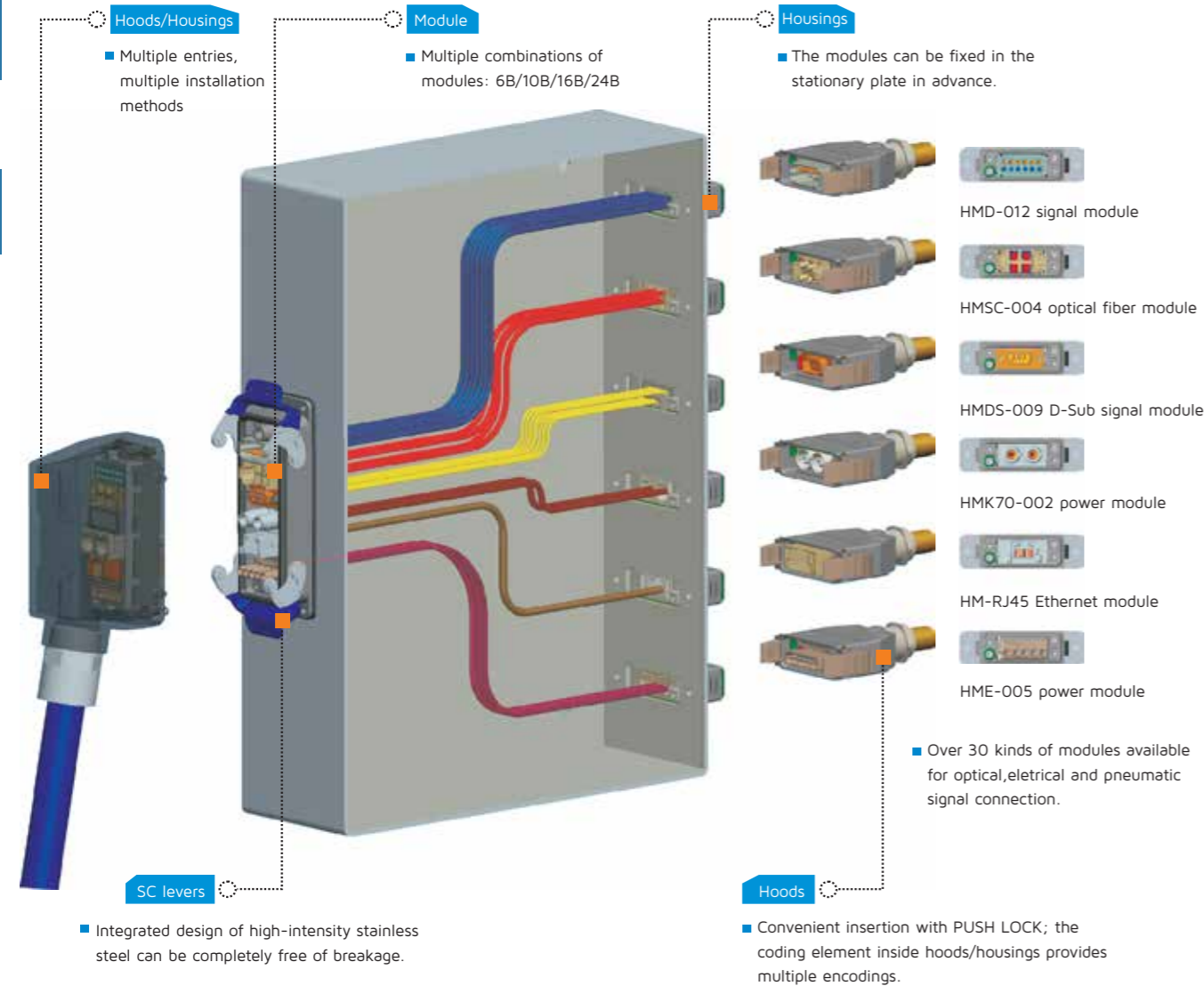
Contents

Rectangular connector

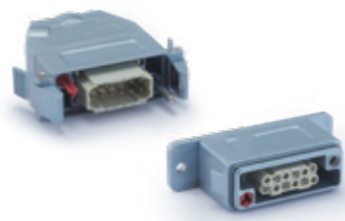
|  | Rated voltage                       | Rated current | Number of contacts          | Wire Connection         | Page                   |
|--|-------------------------------------|---------------|-----------------------------|-------------------------|------------------------|
| HA Series<br>-the slim inserts                                       | 230/400V<br>250V                    | 10A<br>16A    | 3, 4,<br>10, 16, 32         | Crimp / Screw<br>Spring | P33 - P34              |
| HE Series<br>-compact inserts  | 500V                                | 16A           | 6, 10, 16, 24, 32, 48       | Crimp / Screw<br>Spring | P35 - P36              |
| HVE Series<br>-high voltage inserts                                  | 830V<br>400/690V                    | 16A<br>16A    | 3, 6, 10, 12, 20,<br>16, 32 | Screw<br>Crimp          | P37 - P38              |
| HVES Series<br>-high voltage inserts                                 | 830V                                | 16A           | 3, 6, 10, 12, 20            | Spring                  | P39 - P40              |
| HEE Series<br>-high density inserts                                  | 500V<br>*690V,1000V                 | 16A           | 10, 18, 32, 46, 40, 64, 92  | Crimp                   | P41 - P42              |
| HD&HDD Series<br>-ultra-high density inserts                         | -120V/-50V<br>250V<br>*400V, 500V   | 10A<br>10A    | 8<br>7-216                  | Crimp                   | P43 - P44              |
| HSB Series<br>-high heavy-current inserts                            | 400/690V                            | 35A           | 6, 12                       | Screw                   | P45 - P46              |
| HK Series<br>-combination inserts                                    | 160-830V                            | 10A-100A      | various                     | Crimp<br>Screw          | P47 - P48              |
| HE AV Series -extendible inserts<br>HD AV Series -extendible inserts | 500V<br>250V                        | 16A<br>10A    | 6, 10, 16, 24<br>40, 64     | Screw<br>Screw          | P49 - P50<br>P51 - P52 |
| HM Series<br>-flexible and combined inserts                          | 50-5000V<br>Fiber Optic / Pneumatic | 5A-200A       | 1-42                        | Crimp / Screw<br>Spring | P53 - P54              |
| HQ Series<br>-compact inserts  | 230-690V                            | 10A, 16A, 40A | 2-17                        | Crimp<br>Screw          | P55 - P56              |
| HC Series<br>-high heavy-current inserts                             | 1150-4000V                          | 200A-650A     | 1-4                         | Crimp<br>Screw          | P57 - P58              |

### New products: "WU" single module connector series

The innovative products of HSI combine dozens of modules (large current, signal current, optical fiber, gas, Ethernet and so on) into an independent unit with EMC performance and a protection level of IP65.



HSI provides solutions for various branching integration demands!



● Product characteristics:

- smaller width, more compact, space-saving;
- convenient locks save time during assembly;
- encoder inside hoods/housings provides multiple encodings;
- modules can be fixed in the stationary plate in advance;
- With grounding function;
- Grounding screw is in vertical direction, which does not interfere with the face plate so that operation space is large;
- It is matched with multiple single module slugs;
- EMC function;

For more information about the hoods, housings and modules of "WU" Series, please refer to HM Series.

### Product applications

#### Product applications



- Convenient maintenance
- Rapid surefooted installation
- Degree of protection IP68

” HSI provides stable and reliable electrical connection for variable pitch blades and slirings.



■ Turbine parts



■ Turbine parts



■ Pitch system

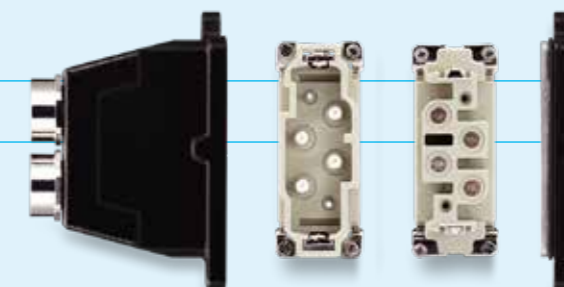
### ” Connectors in wind power generation

Wind power generation is the most mature way of power generation, which is qualified for large-scale development and has commercial development prospect., and it has been developed in the recent years. Reliable operation and convenient maintenance and replacement of functional module system are significant for the wind power station.

HSI connectors provides reliable electrical connection solutions for wind power generation. The HC, HE, RJ45, HR23 series, as well as other series can satisfy various connection of week and strong current in different applications of wind power.

### ” HK Combination Connectors

- Combination of power and signal area in one connector
- Up to 200A current connection
- Match with various kinds of hoods and housings
- An ideal connector for large current connection in narrow space



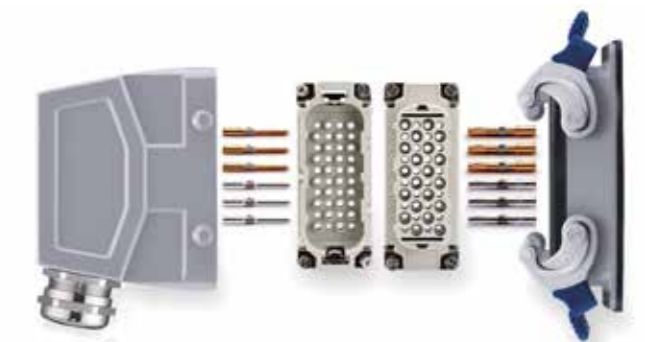
## Connectors in Electric power industry

Reliability, safety, economic efficiency, energy efficiency and environment-friendliness are important indicators of power grid operation. Therefore, new-type intelligent power grid taking physical power grid as foundation and integrating advanced sensor measurement technology, communication technology, information technology, computer technology and control technology is an important way to reach these indicators.

The various model of HSI connectors also facilitates the safety, reliable operation and intelligent transformation of power grid.



” In order to meet the heavy-current and high-voltage requirements in power generation, HSI provides HD HDD series and H version shell to build a secure and stable system.



### ” HD HDD High-Density Inserts

- Safe and reliable, convenient maintenance
- High density of crimping contacts, up to 216 contacts, compact structure
- Match with various kinds of hoods and housings



■ Vacuum circuit breaker



■ High-tension switch cabinet



■ Box-type substation



Connectors in Rail transit

Due to further specialization of labor and requirements for convenient maintenance, the modular design of components in the railway traffic technology is being attached with more and more attention. HSI Connector provides a complete solution for different electrical connections among all kinds of components, ensuring the safe and reliable coordinated operation of each component in various environments.



HM Series Inserts: Flexible Combination

- Modular structure with high flexibility.
- Compact structure saves space.
- Connectors can be assembled according to special requirement.

HSI provides connection solution with high protection grade for important occasions such as high-speed train, jumper wire of subway, air-conditioner and lighting, etc.



Jumper wire



Coupling end



Coupling end



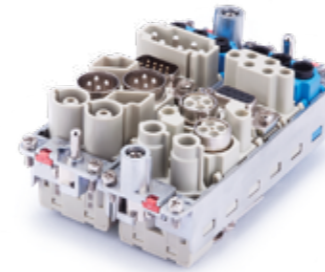
Hauling system



” HSI uses single connector to achieve power and signal transmission so that robot wiring is more reasonable and engineering application can be carried out with high efficiency.

” Use the least space to realize the automation

In the development of modern automation technology, flexibility is a very important indicator, including flexibility and convenience of installation, use, production and commissioning. HSI's HE, HEE, HK, HM and other series, along with hoods and housings with various degrees of protection, cable outlets and locking levers, can satisfy the requirements for space and electrical connection.



” HM Combined suite

- Modular structure
- Universality , reducing inventory
- Realize the power and signal transmission in the least space
- Meet electrical or signal connecting requirements in different fields and for different purposes



■ Outer join



■ Control system



■ Outer join

### Connector in machinery

In machinery manufacturing field, due to the diversified equipment and space requirements, light, gas and other media are also needed to be transmitted in some cases, besides weak current and strong current.

HSI Connector provides integral solutions for this; it not only has many electrical connectors, but also has connectors for other media (such as pneumatic connector). It can satisfy different applications of various kinds of equipment, and simultaneously connect electrical circuit and gas circuit in a connector if necessary.



HSI simplifies complicate system connection and provides the best solution for you!



### HQ compact connectors

- Convenient maintenance
- Compact design
- Match pressure tight or EMC hoods/housings





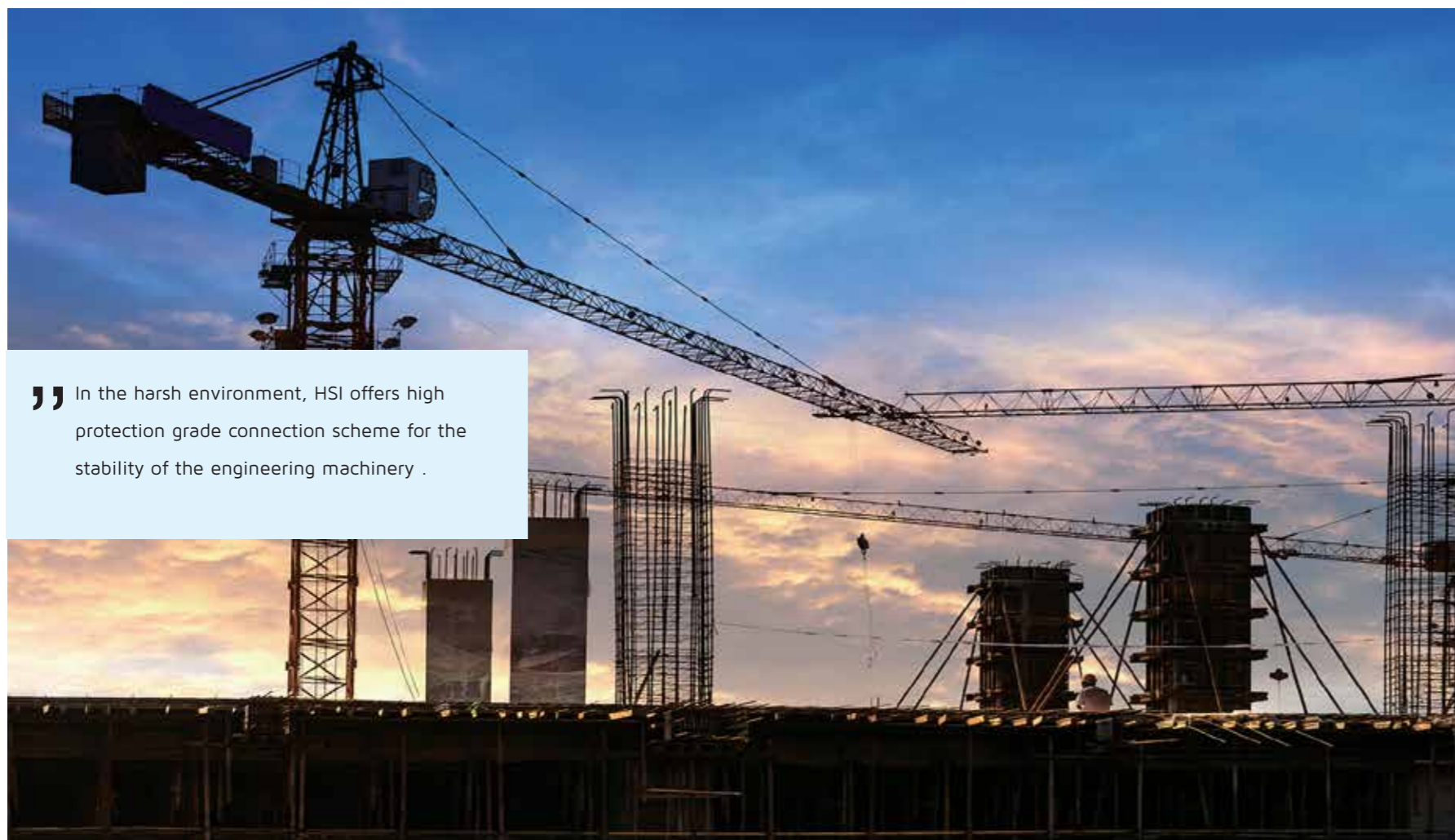
### Connector in engineering machinery

The future demands for diversification, high rise, beautiful appearance, energy conservation and environmental protection in construction industry will absolutely promote the development of engineering machinery.

HSI Connector, boasting of dozens of series, thousand of models, strong current connection up to 650A and shells with IP65/IP68 protection grade, provides reliable electrical connection for the high-end and intelligent development of construction machinery.

\*The hoods/housings developed by HSI for harsh environment reach a salt-spray protection of 500 hours. Compared with similar product around the world, it has more excellent protection capability.

\*Airtightness of fluororubber has formed standard adapter of HSI product. Therefore, it can satisfy protection requirement under chemistry and chemical engineering environment.



In the harsh environment, HSI offers high protection grade connection scheme for the stability of the engineering machinery .



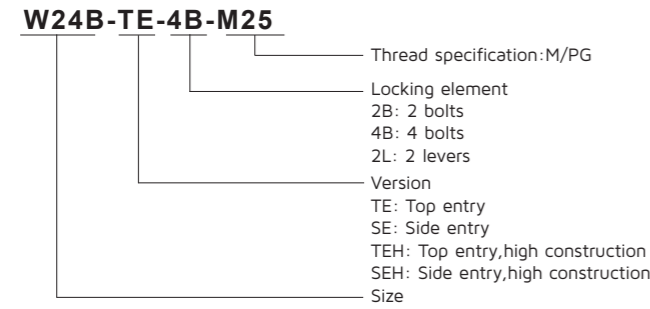
### HEE High density connectors

- High density of crimping contacts , up to 92 pins
- Polarised insert
- Contacts available with either hard silver plated or hard gold plated surface
- Various degrees of protection and cable entries for the hoods
- Airtightness of fluororubber
- Locking levers made of stainless steel

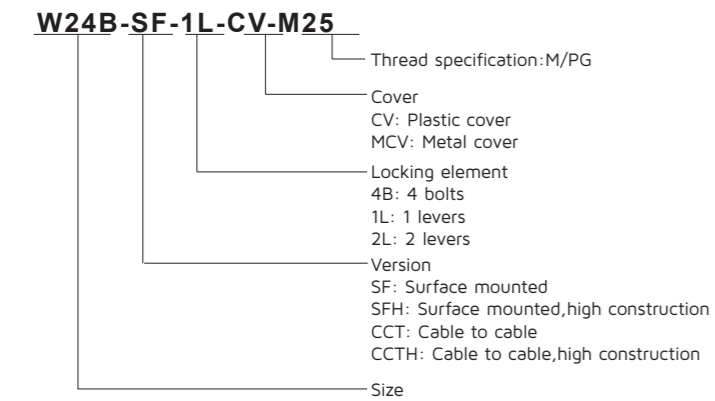
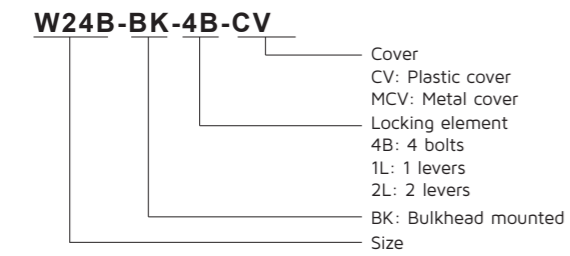


Explain for Designation

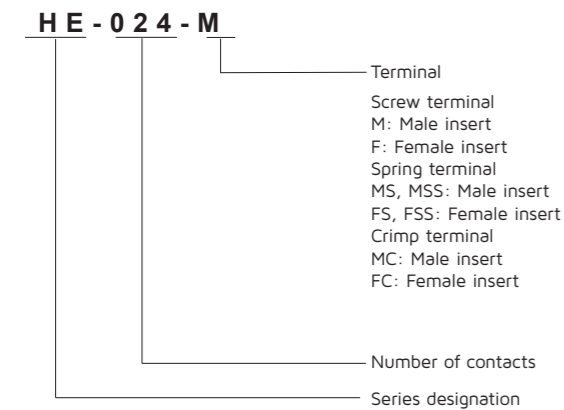
Hood



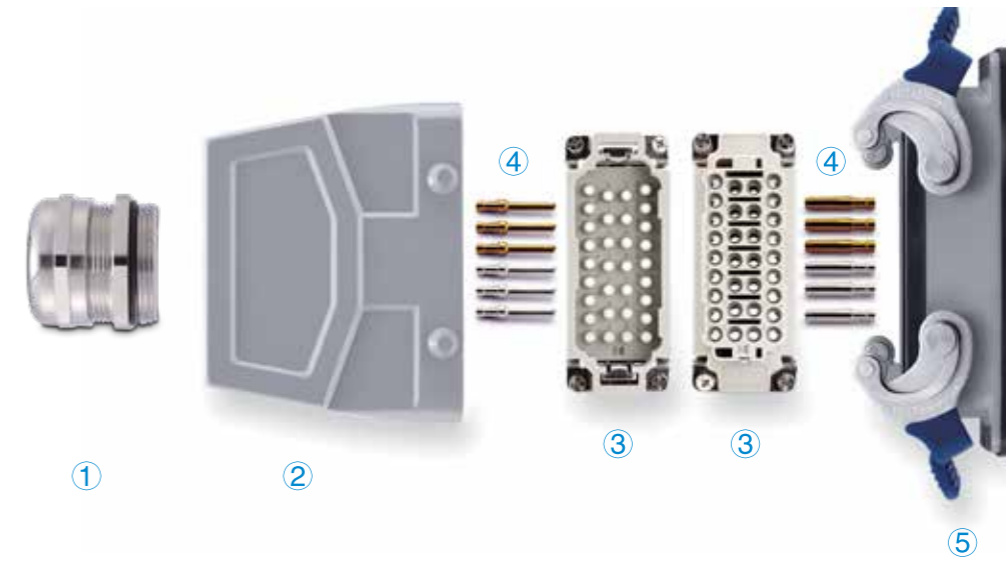
Housing



Insert



Parts of the heavy duty connector



- ① **Cable gland**
  - Nylon or brass nickel plated
  - Universal cable glands
  - Cable gland with normal or multiple seal
  - Other Cable gland
- ② **Hoods**
  - Low or high construction
  - Top or side cable ent
  - 2 bolts or 4 bolts or 2 locking levers
- ③ **Male insert or Female insert**
  - Screw terminal
  - Crimp terminal
  - Cage-clamp terminal
  - Spring terminal
- ④ **Crimp contacts (only for crimp connection insert)**
  - Golden plated or silver plated
  - Rated current: 5A, 10A, 16A, 40A, 70A, 100A, 200A, 350A, 650A
- ⑤ **Housings**
  - Bulkhead mounting or surface mounting or cable to cable
  - Low or high construction
  - 1 or 2 locking levers or 4 bolts
  - With or without thermoplastic/metal covers

Except standard hoods/housings, special hoods/housings with high protection level(IP68 ) and EMC screening are also available for clients.

\*For customized requirement, please contact us.

Product overview

| Hoods | Inserts                             | HE Series<br>Crimp terminal<br>Screw terminal<br>Spring terminal | HVE/HVES Series<br>Screw terminal<br>Spring terminal | HEE Series<br>Crimp terminal | HD/HDD Series<br>Crimp terminal | HSB Series<br>Screw terminal | HK Series<br>Screw terminal | HIM Series<br>Crimp terminal<br>Screw terminal<br>Spring terminal | Housings |
|-------|-------------------------------------|--|--|------------------------------|---------------------------------|------------------------------|-----------------------------|---|----------|
| 6B    |                                     |  |  |                              |                                 |                              |                             |   |          |
| 10B   |                                     |  |  |                              |                                 |                              |                             |   |          |
| 16B   |                                     |  |  |                              |                                 |                              |                             |   |          |
| 24B   |                                     |  |  |                              |                                 |                              |                             |   |          |
| 32B   | suitable for 2 inserts of size 16 B |  |  |                              |                                 |                              |                             |   |          |
| 48B   | suitable for 2 inserts of size 24 B |  |  |                              |                                 |                              |                             |   |          |

Product overview

| Hoods | Inserts | HA Series<br>Crimp terminal<br>Screw terminal<br>Spring terminal | HD Series<br>Crimp terminal | HQ Series<br>Axial screw terminal<br>Crimp terminal | HM Series<br>Crimp terminal<br>Screw terminal<br>Spring terminal | HM Series<br>Q-Coax/Coax | Housings |
|-------|---------|--|-----------------------------|---|--|--------------------------|----------|
| 3A    |         |  |                             |   |  |                          |          |
| 10A   |         |  |                             |   |  |                          |          |
| 16A   |         |  |                             |   |  |                          |          |
| 32A   |         |  |                             |   |  |                          |          |

suitable for 2 inserts of size 16 A

### Size of the Cable Entry

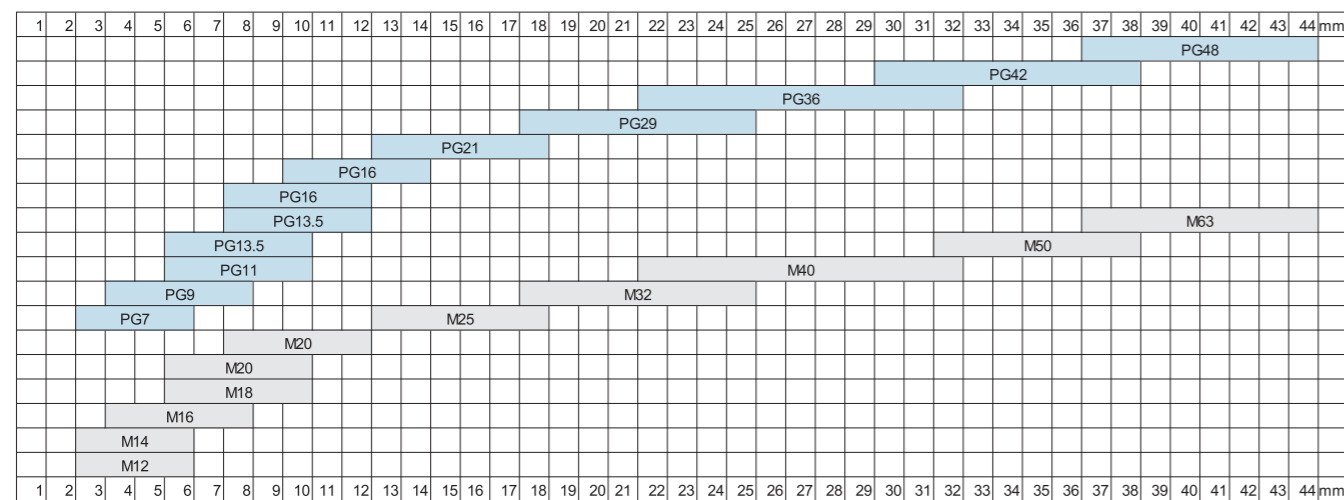
The adoption of metric threads considerably simplifies the understanding and specification of the size of cable entry as the product type description contains the thread dimension.

The following Cross Reference table shows correlation between the PG versions and the new metric types.

Please notice that the maximum cable diameter may be reduced by the new metric cable glands.

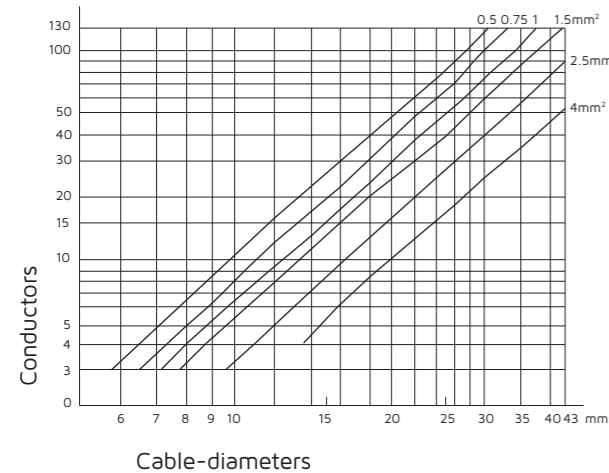
| PG     | Cross reference | M   |
|--------|-----------------|-----|
| PG11   | →               | M20 |
| PG13.5 |                 |     |
| PG16   |                 |     |
| PG21   | →               | M25 |
| PG29   | →               | M32 |
| PG36   | →               | M40 |
| PG42   | →               | M50 |
| PG48   | →               | M63 |

Below is shown the cable range of metric glands:



### Cable

The diagram shows different cable-diameters, being dependent on wire gauges and number of conductors. All data are averages for commercial cables.



### Degree of Protection of Hoods/Housings

The connector's hood, housing, sealing and locking lever protect the inner components from external influences such as mechanical shocks, foreign bodies, humidity, dust, water or other fluids such as cleansing and cooling agents, oils, etc. The degree of protection the housing offers is explained in the IEC 60 529, DIN EN 60 529, standards that categorize enclosures according to foreign body and water protection.

The following table shows the different degrees of protection.

| Code letters international protection | First index figure Foreign bodies protection | First index figure Foreign bodies protection |
|---------------------------------------|--|--|
| IP                                    | 6  | 8  |

| Index figure | Degree of protection   | Index figure     | Degree of protection  |
|--------------|--|------------------|---|
| 0            | No protection: No protection against accidental contact, no protection against solid foreign bodies.   | 0                | No protection against water.  |
| 1            | Protection against large foreign bodies: protection against contact with any large area by hand and against large solid foreign bodies with $\varnothing > 50\text{mm}$ .  | 1                | Drip-proof: Protection against vertical water drips.                          |
| 2            | Protection against medium sized foreign bodies: protection against contact with the fingers, protection against solid foreign bodies with $\varnothing > 12\text{mm}$ .  | 2                | Drip-proof: Protection against water drips (Up to a $15^\circ$ angle)         |
| 3            | Protection against small solid foreign bodies: protection against tools, wires or similar objects $\varnothing > 2.5\text{mm}$ , protection against small foreign solid bodies with $\varnothing > 2.5\text{mm}$ . | 3                | Spray-proof: Protection against diagonal water drips (Up to $60^\circ$ angle) |
| 4            | Protection against grain-shaped foreign bodies: As 3 however, $\varnothing > 1\text{mm}$ .   | 4                | Splash-proof: Protection against splashed water from all directions.          |
| 5            | Protection against injurious deposits of dust: Full protection against contact, protection against interior injurious dust deposits.   | 5                | Hose-proof: Protection against water (out of a nozzle) from all directions.   |
| 6            | Protection against ingress dust: Total protection against contact, protection against penetration dust.  | 6                | Protection against flooding: Protection against temporary flooding.           |
|              |  | 7                | Protection against immersion: Protection against temporary immersion.         |
|              |  | 8                | Water-tight: Protection against temporary Pressure.                           |
|              |  | 9k <sup>1)</sup> | Protected against water from high-pressure / steam jet cleaners               |

1) ... IP x9k is not part of IEC 60529

## Electrical engineering data

Rated impulse voltages (Table B2 of DIN EN 60 664-1)

| Nominal voltage of the supply system<br>(=rated insulation voltage of equipment)  |   |   |  |  | Preferred value for the rated impulse<br>voltage kV (1.2/50 μs) |   |                                      |             |
|---|---|---|--|--|---|---|--------------------------------------|-------------|
|   |   |   |  |  | Overvoltage category  |   |                                      |             |
|   |   |   |  |  | I   | II  | III                                  | IV          |
| Voltage line to earth derived from the nominal voltage of the supply system to the a.c. voltage (r.m.s.value) or d.c. voltage | AC voltage (r.m.s. value)<br>                           | AC voltage<br>  | AC voltage (r.m.s. value d.c. voltage)<br> | AC voltage (r.m.s. value d.c. voltage)<br> | Special protected levels  | Level for electrical equipment (household and others) | Level for distribution supply system | Input level |
| V   | V   | V   | V  | V  |   |   |                                      |             |
| 100   | 66/115  | 66  | 60   | —  | 0.5   | 0.8   | 1.5                                  | 2.5         |
| 150   | 120/208;<br>127/220                                     | 115; 120;<br>127  | 110; 120                                   | 220–110;<br>240–120                        | 0.8   | 1.5   | 2.5                                  | 4           |
| 300   | 220/380;<br>230/400;<br>240/415;<br>260/440;<br>277/480 | 220; 230;<br>240; 260;<br>277                           | 220  | 440–220                                    | 1.5   | 2.5   | 4                                    | 6           |
| 600   | 347/600;<br>380/660;<br>400/690;<br>415/720;<br>480/830 | 347; 380;<br>400; 415;<br>440; 480;<br>500; 577;<br>600 | 480  | 960–480                                    | 2.5   | 4   | 6                                    | 8           |
| 1000  |   | 660; 690;<br>720; 830;<br>1000                          | 1000                                       | —  | 4   | 6   | 8                                    | 12          |

## Over-voltage category

The following categories in line with the standard IEC 60664-1

The overvoltage category is dependent on the mains voltage and the location at which the equipment is installed. It describes the maximum overvoltage resistance of a device in the event of a power supply system fault, e.g. in the event of a lightning strike. According to the relevant standards, there are 4 overvoltage categories.

Category I is equipment for connection to circuits in which measures are taken to limit transient overvoltages to an appropriately low level.

Note: Examples are protected electronic circuits.

Category II is energy-consuming equipment to be supplied from the fixed installation.

Note: Examples of such equipments are appliances, portable tools and other household equipment with similar loads.

Category III is equipment in fixed installations and for cases where the reliability and the availability of the equipment is subject to special requirements.

Note: Examples of such equipment are switches in the fixed installation and equipments for industrial use with permanent connection to the fixed installation. HSI's industrial connectors belong to the overvoltage type.

Category IV is for the use at the origin of the installation.

Note: Examples of such equipment are electricity meters and primary overcurrent protection equipment.

## Electrical engineering data

## Pollution degree

The following categories in line with the standard IEC 60664-1

The dimensioning of operating equipments is dependent on environmental conditions. Any pollution or contamination may give rise to conductivity that, in combination with moisture, may affect the insulating properties of the surface on which it is deposited. The pollution degree influences the design of components in terms of the creepage distance. The pollution degree is defined for exposed, unprotected insulation on the basis of environmental conditions.

## Pollution degree I

No pollution or only dry, non-conductive pollution occurs. The pollution has no influence, such as computer and measuring instrument rooms, for example.

## Pollution degree II

Only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is to be expected, such as residential, sales, laboratories, precision engineering workshops, for example.

## Pollution degree III

Conductive pollution occurs or dry nonconductive pollution occurs which becomes conductive due to condensation which is to be expected, such as unheated storage premises, workshops or boiler rooms, also for the electrical components of assembly or mounting equipment and machine tools, for example. HSI heavy duty connectors are designed as standard for the Pollution Degree.

## Pollution degree IV

The pollution generates persistent conductivity caused by conductive dust or by rain or snow, such as in the environment of outdoor.

## Special ruling for connectors

Subject to compliance with certain preconditions, the standard for connectors permits a lower pollution degree than that which applies to the installation as a whole. This means that in a pollution degree 3 environment, connectors may be used which are electrically rated for pollution degree 2.

## Extract from DIN EN 61 984, Para.6.19.2.3

For a connector with a degree of protection IP54 or higher according to IEC 60529, the insulating parts inside the enclosure may be dimensioned for a lower pollution degree. This also applies to mated connectors where enclosure is ensured by the connector housing and which may only be disengaged for test and maintenance purposes.

The condition fulfills:

- a connector which is protected to at least IP54 acc. to IEC 60 529.
- a connector which is installed in a housing and which as described in the standard is disconnected for testing and maintenance purpose only.
- a connector which is installed in a housing and which when disconnected is protected by a cap or cover to at least IP54.
- a connector located inside a switching cabinet to at least IP54.

Note: These conditions do not extend to connectors which disconnected remain exposed to the industrial atmosphere for an indefinite period.

Typical applications in which to choose pollution degree 2 connectors:

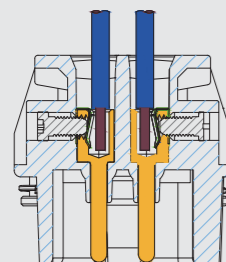
- a connector serving a drive motor which is disconnected only for the purpose of replacing a defective motor, even when the plant or system otherwise calls for pollution degree 3.
- connectors located inside a switching cabinet to IP54. In such cases, it is even possible to dispense with the IP54 housings of the connectors themselves.
- connectors serving a machine of modular design which are disconnected for transport purposes only and enable rapid erection and reliable commissioning. In transit, protective covers or adequate packing must be provided to ensure that the connectors are not affected by pollution/contamination.

## Terminations technology

## Screw terminal

## Advantages

- Wide scope of applicable wire specification;
- No special tool needed;
- Protection plate of wire is available;
- A single hole can be connected to several wires at the same time if necessary;
- Insert has contact pins itself, easy to reduce inventory.

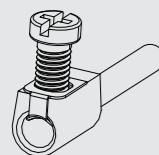


Screw terminals meet VDE 0609 /EN 60 999. Dimensions and tightening torques for testing are shown in the following table. Screw dimensions and tightening torque for screw terminals.

| Wire gauge (mm <sup>2</sup> )      | 1.5 | 2.5 | 4    | 6   | 10  | 16   |
|------------------------------------|-----|-----|------|-----|-----|------|
| Screw thread                       | M3  | M3  | M3.5 | M4  | M4  | M6   |
| Test moment of torque (Nm)         | 0.5 | 0.5 | 0.8  | 1.2 | 1.2 | 1.2* |
| min. pull-out for stranded wire(N) | 40  | 50  | 60   | 80  | 90  | 100  |

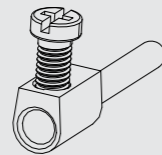
\*for screws without heads

## Terminals with wire protection



the use of ferrules is not necessary: HESeries, HSB Series, HVE Series, HK-006/12, HK-006/6

## Terminals without wire protection



The insulation is first stripped and then a wire ferrule must be used: HK-004/0, HK-004/2, HK-004/8

## Screw terminal

| Inserts                                      | Wire protection |    | min. wire gauge |     | max. wire gauge |     | Stripping length<br>mm |
|--|-----------------|----|-----------------|-----|-----------------|-----|------------------------|
|  | Yes             | No | mm <sup>2</sup> | AWG | mm <sup>2</sup> | AWG |                        |
| HA-003/HA-004                                |                 | √  | 0.75            | 18  | 1.5             | 16  | 4.5                    |
| HA-010/HA-016/HA-032                         | √               |    | 0.75            | 18  | 2.5             | 14  | 7.5                    |
| HE Series, HVE Series                        | √               |    | 0.75            | 18  | 2.5             | 14  | 7.5                    |
| HSB Series                                   | √               |    | 1.5             | 16  | 6               | 10  | 11.5                   |
| HK-006/6, HK-006/12(signal contacts)         | √               |    | 0.2             | 24  | 2.5             | 14  | 7.5                    |
| HK-004/2, HK-004/8(signal contacts)          |                 | √  | 0.5             | 20  | 2.5             | 14  | 7.5                    |
| HK-004/0, HK-004/2, HK-004/8(power contacts) |                 | √  | 1.5             | 16  | 16              | 6   | 14                     |
| HD AV Series, HE AV Series                   | √               |    | 0.2             | 24  | 2.5             | 14  | 8...11                 |

## Terminations technology

## Screw terminal

Recommendation of tightening torque and screwdriver types for inserts connecting with screws

| Screw type | Screws classification  | Inserts  | tightening torque recommendation ( Nm )               | tightening torque recomma ( Lbft ) | screwdriver types recommendation  |
|------------|--|--|---|------------------------------------|---|
| M3         | screw terminal   | HA-003/HA-004, HQ-005/HQ-007/HQ-012 ( PE )   | 0.25  | 0.20                               | cross screwdr PH1   |
|            | screw terminal   | HD AV, HE AV, HK-006/6 ( signal pin ) , HK-006/12 ( signal pin )   | 0.50  | 0.40                               | slot type screwdriver 0.5x3.0   |
|            | screw terminal   | HA-010/HA-016/HA-032, HVE, HE, HME-005, HWK-006/6 ( signal pin )   | 0.50  | 0.40                               | slot type screwdriver 0.6x3.5 or cross screwdriver PH1                          |
|            | Screws fixed on the 3A Hoods/ Housings                               | HA-002/HA-003/HA-004, HD-007/HD-008, HQ-002/HQV-002/HQ-005/HQ-007/HQ-012   | 0.50  | 0.40                               | cross screwdriver PH1   |
|            | Screws fixed on the H10A/H16A/H32A Hoods/Housings, HB Hoods/Housings | HA-010/HA-016/HA-032, HE, HVE, HEE, HD-015 /HD-025/HD-050/HD-040/HD-064/HD-080/HD-128 , HDD, HSB, HK, HWK, HKH, HE AV, HD AV | 0.50  | 0.40                               | slot type screwdriver 0.6x3.5 or cross screwdriver PH1 or cross screwdriver PH2 |
|            | Coding Pin   | CODE-M3, MCODE-M3, GBUSH-M3, GPIN-M3 , MGBUSH-M3, MGPIN-M3   | 0.50  | 0.40                               | slot type screwdriver 1x6.0   |
| M3.5       | Ground terminal  | HA-010/HA-016/HA-032, HD-015/HD-025  | 0.80  | 0.60                               | slot type screwdriver 0.6x3.5 or cross screwdriver PH1                          |
| M4         | screw terminal   | HSB-006/HSB-012  | 1.20  | 0.90                               | slot type screwdriver 0.6x3.5 or cross screwdriver PH1                          |
|            | Ground terminal  | HE, HVE, HD-040/HD-064/HD-080/HD-128, HE AV, HD AV, HK-008/24, HWK-006, HK-006/6 , HK-006/12, HK-008/0, HSB-006/HSB-012      | 1.20  | 0.90                               | slot type screwdriver 0.8x4.5 or cross screwdriver PH2                          |
| M5         | screw terminal   | HWK-006/6 ( power pin )  | 2   | 1.4                                | slot type screwdriver 0.8x4.5   |
|            | Ground terminal  | HK-012/2, HKH-012/0, HK-004/0, HK-004/2, HK-004/8, HK-006/36   | 2   | 1.4                                | slot type screwdriver 0.8x4.5 or cross screwdriver PH2                          |
| M6         | screw terminal   | HK-004/0 ( power pin ) , HK-004/2 ( power pin ) , HK-004/8 ( power pin )   | the corresponding technical data please see chapter 8 |                                    | slot type screwdriver 0.8x4.5   |

slot type screwdriver according to ISO 2380  
cross screwdriver according to ISO 8764

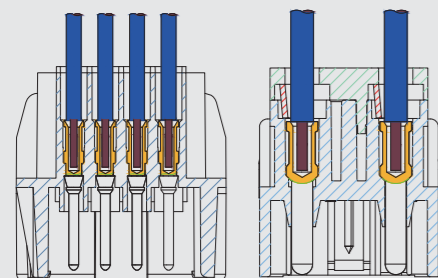
Increasing the tightening torque does not improve considerably the contact resistances. The torque moments were determined when optimum mechanical, thermal and electrical circumstances were given. If the recommended figures are considerably exceeded the wire or the termination can be damaged.

## Terminations technology

## Crimp connection

## Advantages

Applicable to vibration situation;  
Density of the contact pin is high;  
Nearly cold welding guarantees corrosion resistance;  
Able to achieve pre-assembly of wiring harness;  
The same insert can be used for different coated pins according to actual demand.



A perfect crimp connection is gastight, it can achieve the effects of anti-corrosion and cold welding. For this reason, major features in achieving high quality crimp connections are the design of the contact crimping parts and ofcourse the crimping tool itself. Wires to be connected must be carefully matched with the correct size of crimp contacts. If these basic requirements are met, users will be assured of highly reliable onnections with low contact resistance and high resistance to corrosive attack.

Requirements for crimp connectors are laid down in DIN EN 60 352-2 as illustrated in the table. The main criterion by which to judge the quality of a crimp connection is the retention force achieved by the wire conductor in the terminal section of the contact. DIN EN 60 352-2 defines the extraction force in relation to the cross-section of the conductor. When fitted using crimping tools and subject to their utilization in an approved manner, our crimp connectors comply with the required extraction forces.

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

## Overview inserts with crimp terminal

| Wire gauge         |           | Internal diameter | Stripping length l (mm)            |                            |              |
|--------------------|-----------|-------------------|------------------------------------|----------------------------|--------------|
| (mm <sup>2</sup> ) | AWG       | Ø (mm)            | HDD<br>HD<br>R15 Modular<br>(10 A) | HE<br>HA<br>Hv E<br>(16 A) | HC<br>(40 A) |
| 0.14 ... 0.37      | 26 ... 22 | 0.9               | 8                                  | -                          | -            |
| 0.5                | 20        | 1.15              | 8                                  | 7.5                        | -            |
| 0.75               | 18        | 1.3               | 8                                  | 7.5                        | -            |
| 1                  | 18        | 1.45              | 8                                  | 7.5                        | -            |
| 1.5                | 16        | 1.75              | 8                                  | 7.5                        | 9            |
| 2.5                | 14        | 2.25              | 6                                  | 7.5                        | 9            |
| 4                  | 12        | 2.85              | -                                  | 7.5                        | 9.6          |
| 6                  | 10        | 3.5               | -                                  | -                          | 9.6          |
| 10                 | 8         | 4.6               | -                                  | -                          | 15           |

|                | Conductor cross-section | Ø       | Stripping length |
|----------------|-------------------------|---------|------------------|
| 100 A Modul    | 10 mm <sup>2</sup>      | 4.3 mm  | 19.0 mm          |
|                | 16 mm <sup>2</sup>      | 5.5 mm  | 19.0 mm          |
|                | 25 mm <sup>2</sup>      | 7.0 mm  | 19.0 mm          |
| HC Modular 350 | 35 mm <sup>2</sup>      | 8.2 mm  | 16.0 mm          |
|                | 50 mm <sup>2</sup>      | 10.0 mm | 28.0 mm          |
|                | 70 mm <sup>2</sup>      | 11.5 mm | 28.0 mm          |
|                | 95 mm <sup>2</sup>      | 13.5 mm | 30.0 mm          |
| HC Modular 650 | 120 mm <sup>2</sup>     | 15.5 mm | 24.0 mm          |
|                | 240 mm <sup>2</sup>     | 22.5 mm | 50.0 mm          |

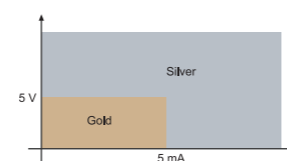
for fine stranded wires according to IEC 60 228 class 5

## Tensile strength of crimped connections (Table 1: DIN EN 60 352-2)

| Conductor cross-section |     | Tensile strength |
|-------------------------|-----|------------------|
| mm <sup>2</sup>         | AWG | N                |
| 0.05                    | 30  | 6                |
| 0.08                    | 28  | 11               |
| 0.12                    | 26  | 15               |
| 0.14                    |     | 18               |
| 0.22                    | 24  | 28               |
| 0.25                    |     | 32               |
| 0.32                    | 22  | 40               |
| 0.5                     | 20  | 60               |
| 0.75                    |     | 85               |
| 0.82                    | 18  | 90               |
| 1.0                     |     | 108              |
| 1.3                     | 16  | 135              |
| 1.5                     |     | 150              |
| 2.1                     | 14  | 200              |
| 2.5                     |     | 230              |
| 3.3                     | 12  | 275              |
| 4.0                     |     | 310              |
| 5.3                     | 10  | 355              |
| 6.0                     |     | 360              |
| 8.4                     | 8   | 370              |
| 10.0                    |     | 380              |

## The selection of contact surface plated

Below is a table derived from actual experiences



Recommendation

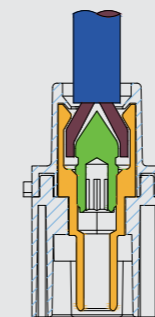
Notes: The tools for crimp terminal may influence the product quality and stability. Please select the tools recognized by our company.

## Terminations technology

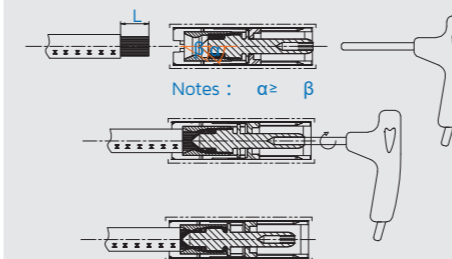
## Axial screw terminal

## Advantages

Scope of applicable wire specification is wide;  
Special tool will not be used;  
Little space required;  
Simple operation;



## Axial screw crimping instruction



.Strip insulation from the wire , the length as per the form and insert the wire into the contact until insulation layer is flush with the wiring access of the contact. Do not twist the strands of the wire.

.Hold the wire in position and tighten the wire from the mating side by a twist driver (SW-2x40), the tightening torque reference the form.

.Complete wiring .

## Remarks on the axial screw technique :

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

Background:

According to DIN VDE 0295 for cables and insulated wires the wire gauge will be determined by conductance ( $\Omega/\text{km}$ ) and maximum wire diameter. A minimum cable diameter is not specified! (Example: nominal wire gauge 95 mm<sup>2</sup> → real, geometric wire gauge 89 mm<sup>2</sup>)

Recommendation:

The use of cables with an extreme geometric wire gauge deviation should be checked separately with the use of the axial screw termination.

| Outer cable diameter (mm) | Maximum fixing distance (mm) |          |
|---------------------------|------------------------------|----------|
|                           | horizontal                   | vertical |
| D ≤ 9                     | 250                          | 400      |
| 9 < D < 15                | 300                          | 400      |
| 15 < D < 20               | 350                          | 450      |
| 20 < D < 40               | 400                          | 550      |

Cables:

The axial screw technology is developed for wires according to DIN EN 60 228 class 5 (see table: Wire assembly according to DIN EN 60 228). Deviating cable assemblies have to be tested separately.

Assembly remarks:

Before starting the assembly the user must ensure that the axial cone is screwed fully downward to completely open the contact chamber. After stripping the cable insulation the strands must not be twisted and the maximum cable insulation must not exceed the recommended dimension. Insert the wire completely into the contact chamber until the copper strands reach the bottom. Keep the cable in position while applying the recommended tightening torque.

Maintenance of the axial screw termination:

After initial assembly it is only allowed to reapply the recommended tightening torque once in order to avoid damage to individual cable strands.

## Wire assembly according to DIN EN 60 228

| Wire gauge (mm <sup>2</sup> ) | Stranded wires DIN EN 60 228 class 2 | Fine stranded wires DIN EN 60 228 class 5 | Super fine stranded wires DIN EN 60 228 class 6 |             |             |             |
|-------------------------------|--------------------------------------|---|---|-------------|-------------|-------------|
|                               |                                      |   |   |             |             |             |
| 0.5                           | 7 x 0.30                             | 16 x 0.20                                 | 28 x 0.15                                       | 64 x 0.10   | 131 x 0.07  | 256 x 0.05  |
| 0.75                          | 7 x 0.37                             | 24 x 0.20                                 | 42 x 0.15                                       | 96 x 0.10   | 195 x 0.07  | 384 x 0.05  |
| 1                             | 7 x 0.43                             | 32 x 0.20                                 | 56 x 0.15                                       | 128 x 0.10  | 260 x 0.07  | 512 x 0.05  |
| 1.5                           | 7 x 0.52                             | 30 x 0.25                                 | 84 x 0.15                                       | 192 x 0.10  | 392 x 0.07  | 768 x 0.05  |
| 2.5                           | 7 x 0.67                             | 50 x 0.25                                 | 140 x 0.15                                      | 320 x 0.10  | 651 x 0.07  | 1280 x 0.05 |
| 4                             | 7 x 0.85                             | 56 x 0.30                                 | 224 x 0.15                                      | 512 x 0.10  | 1040 x 0.07 |             |
| 6                             | 7 x 1.05                             | 84 x 0.30                                 | 192 x 0.20                                      | 768 x 0.10  | 1560 x 0.07 |             |
| 10                            | 7 x 1.35                             | 80 x 0.40                                 | 320 x 0.20                                      | 1280 x 0.10 | 2600 x 0.07 |             |
| 16                            | 7 x 1.70                             | 128 x 0.40                                | 512 x 0.20                                      | 2048 x 0.10 |             |             |
| 25                            | 7 x 2.13                             | 200 x 0.40                                | 800 x 0.20                                      | 3200 x 0.10 |             |             |
| 35                            | 7 x 2.52                             | 280 x 0.40                                | 1120 x 0.20                                     |             |             |             |
| 50                            | 19 x 1.83                            | 400 x 0.40                                | 705 x 0.30                                      |             |             |             |
| 70                            | 19 x 2.17                            | 356 x 0.50                                | 990 x 0.30                                      |             |             |             |
| 95                            | 19 x 2.52                            | 485 x 0.50                                | 1340 x 0.30                                     |             |             |             |
| 120                           | 37 x 2.03                            | 614 x 0.50                                | 1690 x 0.30                                     |             |             |             |
| 150                           | 37 x 2.27                            | 765 x 0.50                                | 2123 x 0.30                                     |             |             |             |
| 185                           | 37 x 2.52                            | 944 x 0.50                                | 1470 x 0.40                                     |             |             |             |
| 240                           | 61 x 2.24                            | 1225 x 0.50                               | 1905 x 0.40                                     |             |             |             |

## Terminations technology

## Overview inserts with axial screw terminal

| Insert  | Wire gauge           | Stripping length<br>(mm)  | Tightening torque<br>(Nm)  | Max. cable insulation diameter<br>(mm) | Size hexagon recess<br>(SW) | Insert dimension for cable indication (ISK)<br>(mm) |
|---|----------------------|---|--|--|-----------------------------|---|
|   | (mm <sup>2</sup> )   |   |  |  |                             |   |
| HK-006/12                                       | 2.5 - 8              | 2.5 mm <sup>2</sup> : 8+1<br>4 mm <sup>2</sup> : 8+1<br>6 mm <sup>2</sup> : 8+1<br>8 mm <sup>2</sup> : 8+1  | 2.5 mm <sup>2</sup> : 1.5<br>4 mm <sup>2</sup> : 1.5<br>6 mm <sup>2</sup> : 2<br>8 mm <sup>2</sup> : 2 | 6.2                                    | 2                           | 4.7   |
|   | 6 - 10               | 6 mm <sup>2</sup> : 8+1<br>8 mm <sup>2</sup> : 8+1<br>10 mm <sup>2</sup> : 8+1                              | 6 mm <sup>2</sup> : 2<br>8 mm <sup>2</sup> : 2<br>10 mm <sup>2</sup> : 2                               | 6.2                                    | 2                           | 4.7   |
| HK-006/6  | 16 - 35              | 13+/-1  | 16 mm <sup>2</sup> : 6<br>25 mm <sup>2</sup> : 7<br>35 mm <sup>2</sup> : 8                             | 11.4                                   | 4                           | 4.9   |
| HK-008/0  | 10 - 25              | 13+/-1  | 10 mm <sup>2</sup> : 6<br>16 mm <sup>2</sup> : 6<br>25 mm <sup>2</sup> : 7                             | 11.4                                   | 4                           | 4.75  |
| HQV-002<br>HQ-002/O High Voltage                | 2.5 - 10<br>2.5 - 10 | 8+1<br>PE: 2 mm longer  | 1.8  | 7.3                                    | 2                           | 5.6   |
| 200 A module without PE<br>200 A module with PE | 25 - 40              | 25 mm <sup>2</sup> : 16<br>40 mm <sup>2</sup> : 16  | 25 mm <sup>2</sup> : 8<br>40 mm <sup>2</sup> : 8   | 12<br>16                               | 5                           | 3   |
| 200 A module without PE<br>200 A module with PE | 40 - 70              | 40 mm <sup>2</sup> : 16<br>70 mm <sup>2</sup> : 16  | 40 mm <sup>2</sup> : 9<br>70 mm <sup>2</sup> : 10  | 12<br>16                               | 5                           | 3   |
| 100 A module                                    | 10 - 25              | 13+/-1  | 10 mm <sup>2</sup> : 6<br>16 mm <sup>2</sup> : 6<br>25 mm <sup>2</sup> : 7                             | 11.4                                   | 4                           | 4.9   |
|   | 16 - 35              | 13+/-1  | 16 mm <sup>2</sup> : 6<br>25 mm <sup>2</sup> : 7<br>35 mm <sup>2</sup> : 8                             | 11.4                                   | 4                           | 4.9   |
| 70 A module                                     | 6 - 16               | 6 mm <sup>2</sup> : 11+1<br>10 mm <sup>2</sup> : 11+1<br>16 mm <sup>2</sup> : 11+1                          | 6 mm <sup>2</sup> : 2<br>10 mm <sup>2</sup> : 3<br>16 mm <sup>2</sup> : 4                              | 8.9                                    | 2.5                         | 7.4   |
|   | 14 - 22              | 12.5+1  | 14 mm <sup>2</sup> : 4<br>16 mm <sup>2</sup> : 4<br>22 mm <sup>2</sup> : 5                             | 10                                     | 2.5                         | 5.9   |
| 40 A module                                     | 2.5 - 8              | 2.5 mm <sup>2</sup> : 5+1<br>4 mm <sup>2</sup> : 5+1<br>6 mm <sup>2</sup> : 8+1<br>8 mm <sup>2</sup> : 11+1 | 2.5 mm <sup>2</sup> : 1.5<br>4 mm <sup>2</sup> : 1.5<br>6 mm <sup>2</sup> : 2<br>8 mm <sup>2</sup> : 2 | 4<br>4<br>6<br>8.2                     | 2                           | 4.7   |
|   | 6 - 10               | 6 mm <sup>2</sup> : 8+1<br>10 mm <sup>2</sup> : 11+1  | 6 mm <sup>2</sup> : 2<br>10 mm <sup>2</sup> : 2  | 6<br>10.5                              | 2                           | 4.7   |

## Overview inserts with axial screw terminal

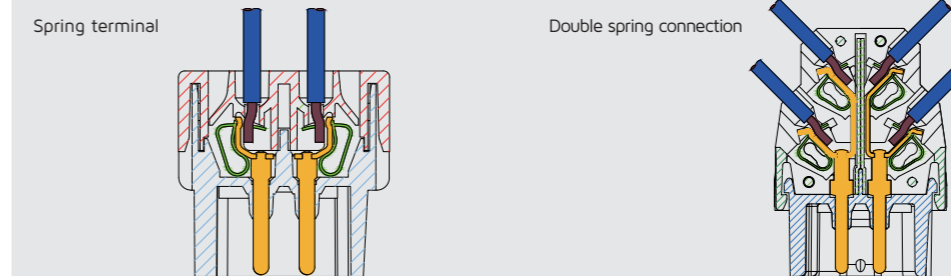
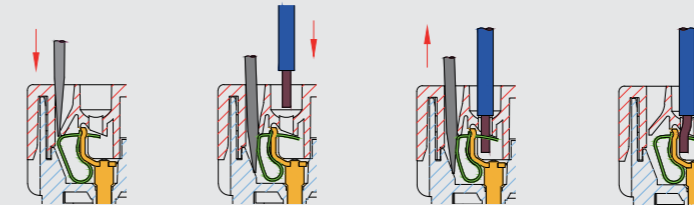
|                                  |                   |  |   |                    |   |                |
|----------------------------------|-------------------|--|---|--------------------|---|----------------|
| Module with axial screw terminal | 2.5 - 8<br>6 - 10 | 2.5 mm <sup>2</sup> : 5+1<br>4 mm <sup>2</sup> : 5+1<br>6 mm <sup>2</sup> : 8+1<br>10 mm <sup>2</sup> : 11+1 | 2.5 mm <sup>2</sup> : 1.5<br>4 mm <sup>2</sup> : 1.5<br>6 mm <sup>2</sup> : 2<br>10 mm <sup>2</sup> : 2 | 4<br>4<br>6<br>8.2 | 2 | 5.2            |
| HK-003/0 straight                | 35 - 70           | 22   | 35 mm <sup>2</sup> : 8<br>50 mm <sup>2</sup> : 9<br>70 mm <sup>2</sup> : 10                             | 15                 | 5 | 8.2            |
| HK-003/0 angled                  | 35 - 70           | 22   | 35 mm <sup>2</sup> : 8<br>50 mm <sup>2</sup> : 9<br>70 mm <sup>2</sup> : 10                             | 15                 | 5 | 9              |
| HK-003/2 straight                | 35 - 70           | 22   | 35 mm <sup>2</sup> : 8<br>50 mm <sup>2</sup> : 9<br>70 mm <sup>2</sup> : 10                             | 15<br>PE: 10       | 5 | 8.2<br>PE: 7.2 |
| HK-003/2 angled                  | 35 - 70           | 22   | 35 mm <sup>2</sup> : 8<br>50 mm <sup>2</sup> : 9<br>70 mm <sup>2</sup> : 10                             | 15<br>PE: 10       | 5 | 9.0            |
| HC Modular 650                   | 70 - 120          | 23+2   | 70 mm <sup>2</sup> : 12<br>95 mm <sup>2</sup> : 14<br>120 mm <sup>2</sup> : 16                          | 26.5               | 8 | 28             |
|                                  | 150 - 185         | 23+2   | 150 mm <sup>2</sup> : 17<br>185 mm <sup>2</sup> : 18  | 26.5               | 8 | 28             |

## Terminations technology

## Spring terminal

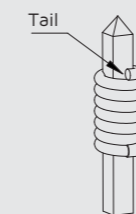
## Advantages

No special tool needed;  
Applicable to vibration situation;  
Insert has contact pins itself, easy to reduce inventory.

Spring terminal-connection step  
Screwdriver width: 3.0 x 0.5 mm

| Inserts                                 | max. wire gauge    |           | Stripping length<br>l (mm) |
|---|--------------------|-----------|----------------------------|
|   | (mm <sup>2</sup> ) | AWG       |                            |
| HE Spring terminal, HVE Spring terminal | 0.14 ... 2.5       | 26 ... 14 | 7 ... 9                    |
| HE Double spring connection             | 0.14 ... 2.5       | 26 ... 14 | 9 ... 11                   |
| HK-004/4                                | 0.14 ... 2.5       | 26 ... 14 | 7 ... 9                    |
| HME-005-MS/FS                           | 0.14 ... 2.5       | 26 ... 14 | 7 ... 9                    |

## Wrap terminal



## The characteristic of wrap terminal:

Solderless wrap connection technology, is to use a special tool-winding device, exerts a pulling force to the single unit solid bare wire, make it according to the prescribed number of turns in a tightly ling edges at the terminal, so that the wire and the terminal form firm joints technology, so as to achieve a reliable electrical connection. It is different from screw connection, welding, crimping, piercing connection way.

## Advantage:

Wrap connection has more advantage than solder connection, see the following: ;  
Higher reliability, longer working life;  
The junction is durable, anti-fatigue, corrosion resistance;  
Production quality is stable, neat appearance, easier operation, and eliminate the virtual welding problems of the solder connection;  
Achieve high density mounting and product miniaturization.  
Reduce manufacture costs and improve work efficiency.



## Terminations technology

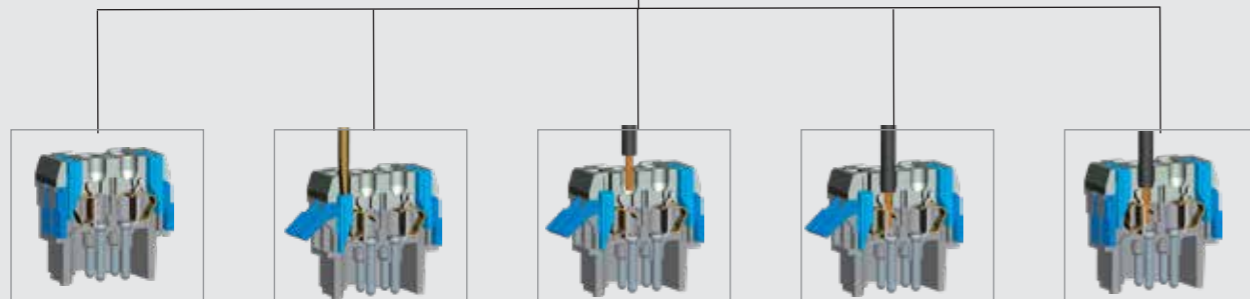
## Spring terminal

## HE push spring insert

## Characteristics of the product:

The product can be connected and disassembled in limited space without special tool. Installation and disassembly can't be disturbed by tools, operation is convenient; Furthermore, during connection and disassembly, the hole can be opened through pushing the corresponding lever. To make it more efficient, all the holes can be opened with a slotted screwdriver simultaneously. The tool is not contacted to the conductor while operating, therefore it avoids electric shock.

## Assembly instructions



- step 1 : Strip the insulate layer by 9-11mm;  
 step 2 : Using slotted screwdriver of spec. 0.5\*3 to insert into groove of rectangle pushing lever, and push to the bottom, to let the driving lever tilt out. At this moment the spring stabilizes at opening condition.  
 step 3 : Insert striped wire/cable into the round hole.  
 step 4 : Reset the driving lever until hearing the "bang", which indicates the pushing lever automatically reset and the spring shut, the wire/cable and contact are connected securely.  
 step 5 : Installation is completed.

## Tools

HE B Spring open machine<sup>1)</sup>

| Description                 | Designation | Order NO.        |
|-----------------------------|-------------|------------------|
| for all HE B spring inserts | SOM01       | 198 001 003 0008 |

1) It can open all the shrapnel windows of insert at one time; suitable for using in mass assembly, greatly improving the efficiency of the connection.

## Hoods/Housings

## Screw tightening torque

## Recommended tightening torque for bulkhead mounted housings

| Series                               | Number of screws | Size of screws | Recommended Tightening torque (Nm) | Remarks |
|--------------------------------------|------------------|----------------|------------------------------------|---------|
| H3A                                  | 2                | M 3            | 0.8 ... 1.0                        | Gasket  |
| H10A / 16A                           | 4                | M 3            | 0.8 ... 1.0                        | Gasket  |
| H32A                                 | 4                | M 4            | 0.8 ... 1.0                        | Gasket  |
| H6B / H10B / H16B / H24B             | 4                | M 4            | 0.8 ... 1.0                        | Gasket  |
| H32B                                 | 4                | M 5            | min. 2.5                           | Gasket  |
| H48B                                 | 4                | M 6            | min. 3.0                           | O-ring  |
| HP3A                                 | 2                | M 4            | min. 1.0                           | O-ring  |
| HP6B / HP10B / HP16B / HP24B         | 4                | M 6            | min. 3.0                           | O-ring  |
| HP6B/H / HP10B/H / HP16B/H / HP24B/H | 4                | M 6            | min. 3.0                           | O-ring  |

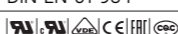
To offer safe protection the surface condition for mounting panel should be according to DIN 4766:  
 Waviness  $\leq 0.2$  mm on 200 mm distance  
 Roughness  $R_a \leq 16$   $\mu$ m

Compact standard connector



## HA SERIES The slim inserts

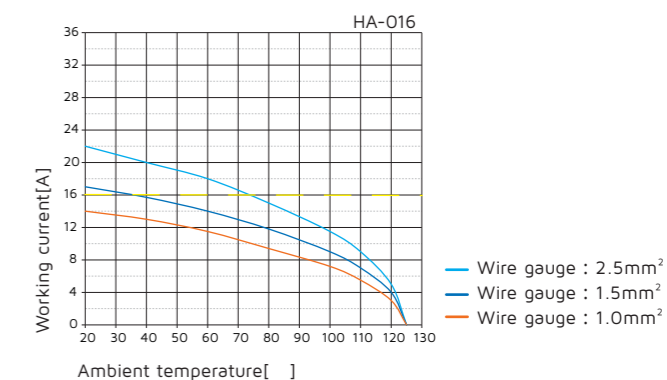
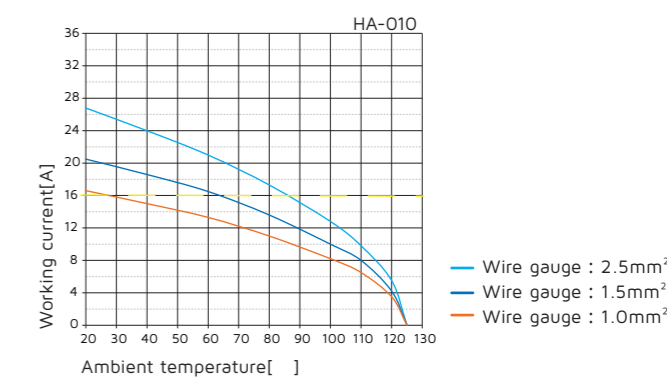
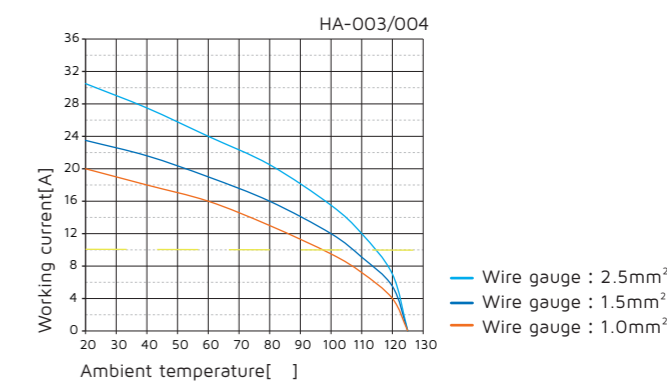
## Technical characteristics

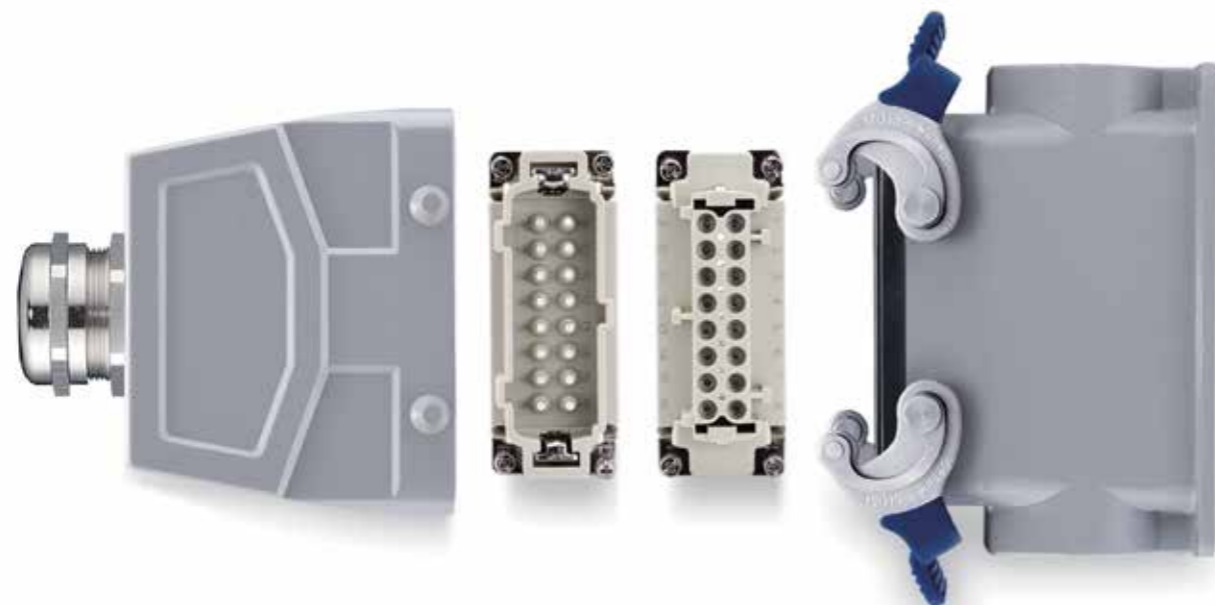
|  |   |
|--|---|
| Specifications                         | DIN EN 60 664<br>DIN EN 61 984  |
| Approvals                              |  |
| <b>Inserts</b>                         |   |
| Number of contacts                     | 3,4,10,16,32(2X16)+PE   |
| Electrical data acc. to EN 61 984      |   |
| HA-002/HA-003/HA-004                   |   |
| -Rated current                         | 10A   |
| -Rated voltage conductor-ground        | 230V  |
| -Rated voltage conductor-conductor     | 400V  |
| -Rated impulse voltage                 | 4kV   |
| -Pollution degree                      | 3   |
| -or                                    | 10A 250V 4kV 3  |
| HA-010/HA-016                          |   |
| -Rated current                         | 16A   |
| -Rated voltage                         | 250V  |
| -Rated impulse voltage                 | 4kV   |
| -Pollution degree                      | 3   |
| -Pollution degree 2 also               | 16A 230/400V 4kV 2  |
| Rated voltage acc. to UL               | 600V  |
| Insulation resistance                  | $\geq 10^{10}\Omega$  |
| Material                               | polycarbonate   |
| Limiting temperatures                  | -40 ... +125  |
| Flammability acc. to UL 94             | V0  |
| Mechanical working life(mating cycles) | $\geq 500$  |
| <b>Contacts</b>                        |   |
| Material                               | copper alloy  |
| Surface                                | hard-gold plated<br>hard-silver plated  |
| Contact resistance                     | $\leq 1m\Omega$   |
| <b>Screw terminal</b>                  |   |
| -Wire gauge                            | 0.75-1.5mm <sup>2</sup> ( HA-003/004 )<br>0.75-2.5mm <sup>2</sup> ( HA-010/016 )    |
| -AWG                                   | 18-16 ( HA-003/004 )<br>18-14 ( HA-010/016 )  |
| -Tightening/Test torque                | 0.25Nm ( HA-003/004 ) or<br>0.5Nm ( HA-010/016 )                                    |
| <b>Crimp terminal</b>                  |   |
| -Wire gauge                            | 0.14-4.0mm <sup>2</sup>   |
| -AWG                                   | 26-12   |
| <b>Spring terminal</b>                 |   |
| -Wire gauge                            | 0.14-2.5mm <sup>2</sup><br>(Not suitable for connecting terminal)                   |
| -AWG                                   | 26-14   |

## Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5





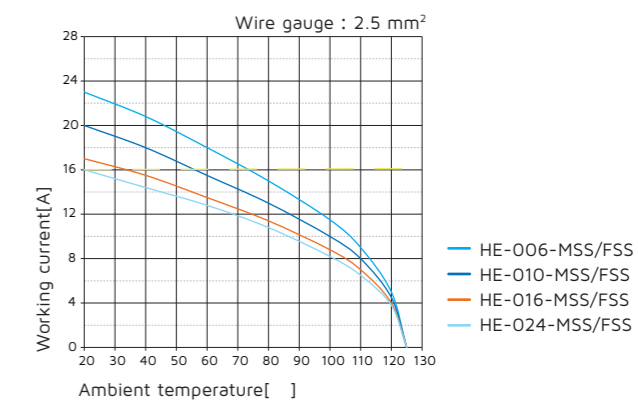
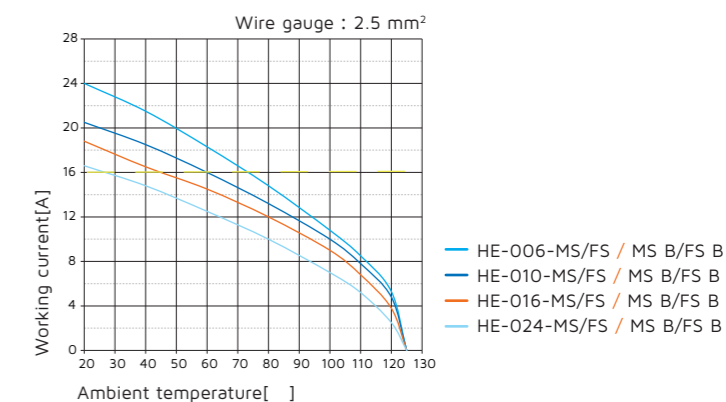
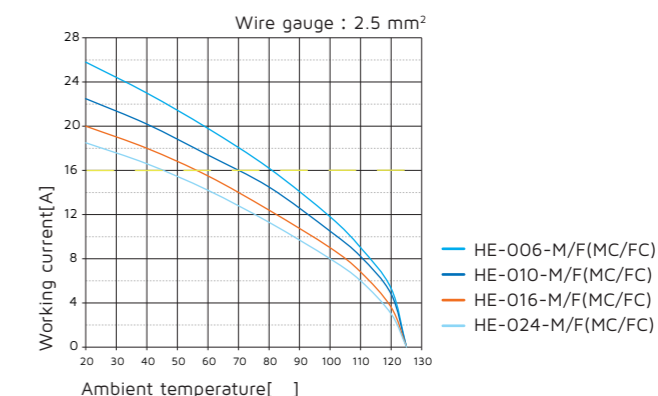
## Technical characteristics

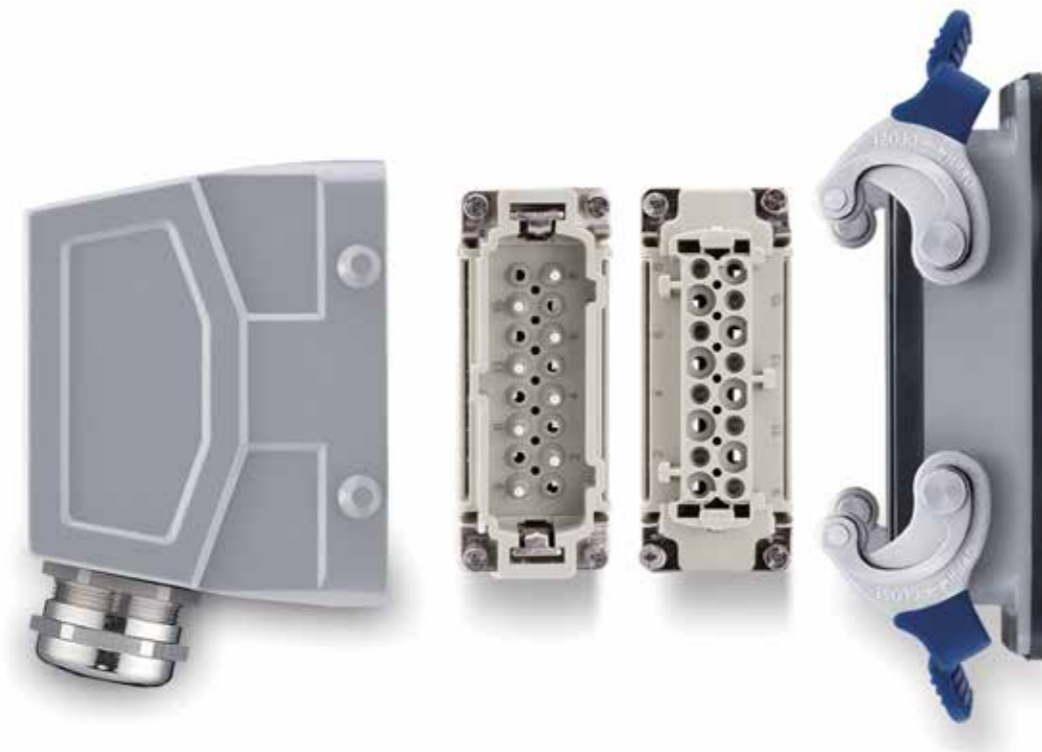
|  |  |
|--|--|
| Specifications                         | DIN EN 60 664<br>DIN EN 61 984         |
| Approvals                              |  |
| <b>Inserts</b>                         |  |
| Number of contacts                     | 6,10,16,24,32(2X16),48(2X24)+PE        |
| Electrical data acc. to DIN EN 61 984  |  |
| -Rated current                         | 16A                                    |
| -Rated voltage                         | 500V                                   |
| -Rated impulse voltage                 | 6KV                                    |
| -Pollution degree                      | 3                                      |
| -Pollution degree 2 also               | 16A 400/690V 6kV 2                     |
| Rated voltage acc. to UL               | 600V                                   |
| Insulation resistance                  | $\geq 10^{10}\Omega$                   |
| Material                               | polycarbonate                          |
| Limiting temperatures                  | -40 ... +125                           |
| Flammability acc. to UL 94             | V0                                     |
| Mechanical working life(mating cycles) | $\geq 500$                             |
| <b>Contacts</b>                        |  |
| Material                               | copper alloy                           |
| Surface                                | hard-gold plated<br>hard-silver plated |
| Contact resistance                     | $\leq 1m\Omega$                        |
| <b>Screw terminal</b>                  |  |
| -Wire gauge                            | 0.75-2.5mm <sup>2</sup>                |
| -AWG                                   | 18-14                                  |
| -Tightening/Test torque                | 0.5Nm                                  |
| -Stripping length                      | 7.0mm                                  |
| <b>Crimp terminal</b>                  |  |
| -Wire gauge                            | 0.14-4.0mm <sup>2</sup>                |
| -AWG                                   | 26-12                                  |
| -Stripping length                      | 7.5mm                                  |
| <b>Spring terminal</b>                 |  |
| -Wire gauge                            | 0.14-2.5mm <sup>2</sup>                |
| -AWG                                   | 26-14                                  |
| -Stripping length                      | 7-9mm                                  |

## Current carrying capacity


The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5





## Technical characteristics

|  |   |
|--|---|
| Specifications                         | DIN EN 60 664<br>DIN EN 61 984  |
| Approvals                              |  |
| <b>Inserts</b>                         |   |
| Number of contacts                     | 3,6,10,12,20+PE   |
| Electrical data acc. to DIN EN 61 984  |   |
| -Rated current                         | 16A   |
| -Rated voltage                         | 830V  |
| -Rated impulse voltage                 | 8kV   |
| -Pollution degree                      | 3   |
| -Pollution degree 2 also               | 16A 1000V 8kV 2   |
| -or                                    | 16A 720/1250V 8kV 2   |
| -Relay contacts                        | 16A 500V 6kV 3  |
| Rated voltage acc. to UL               | 600V  |
| Relay contacts                         | 250V  |
| Insulation resistance                  | $\geq 10^{10}\Omega$  |
| Material                               | polycarbonate   |
| Limiting temperatures                  | -40 ...+125   |
| Flammability acc. to UL 94             | V0  |
| Mechanical working life(mating cycles) | $\geq 500$  |
| <b>Contacts</b>                        |   |
| Material                               | copper alloy  |
| Surface                                | hard-silver plated  |
| Contact resistance                     | $\leq 1m\Omega$   |
| <b>Screw terminal</b>                  |   |
| -Wire gauge                            | 1.0-2.5mm <sup>2</sup>  |
| -AWG                                   | 18-14   |
| -Tightening/test torque                | 0.5Nm   |
| -Stripping length                      | 7.0mm   |
| <b>Crimp terminal</b>                  |   |
| -Wire gauge                            | 0.14-4.0mm <sup>2</sup>   |
| -AWG                                   | 26-12   |
| -Stripping length                      | 7.5mm   |

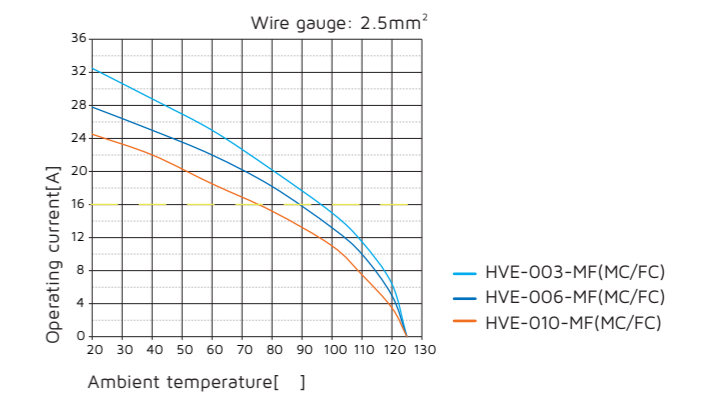
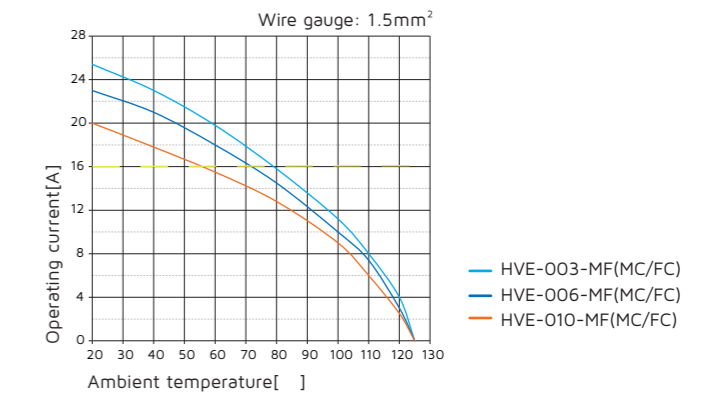
For a fully equipped crimp connector the following contacts are required:

| Type    | Contacts total | Operating contacts | Relay contacts |
|---------|----------------|--------------------|----------------|
| HVE-003 | 5              | 3                  | 2              |
| HVE-006 | 8              | 6                  | 2              |
| HVE-010 | 12             | 10                 | 2              |
| HVE-012 | 16             | 12                 | 4              |
| HVE-020 | 24             | 20                 | 4              |

## Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5



HVES SERIES

High voltage connector(spring piece connector)



HVES SERIES High voltage inserts

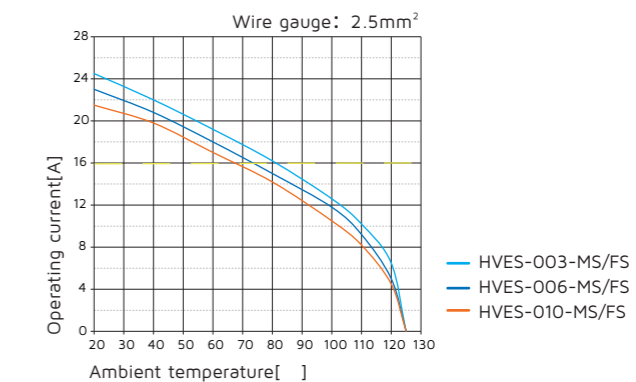
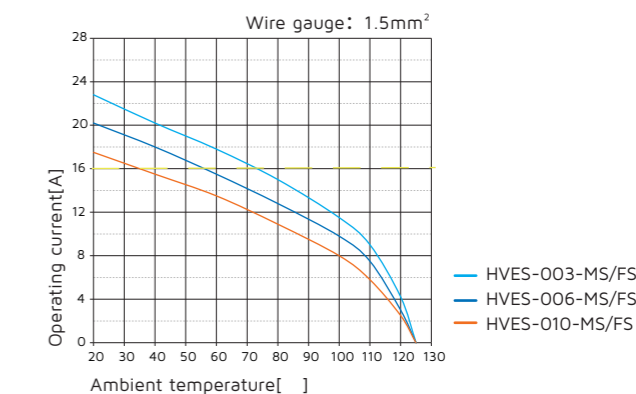
Technical characteristics

|  |  |
|--|--|
| Specifications                         | DIN EN 60 664<br>DIN EN 61 984   |
| Approvals                              | UL, ENEC   |
| Inserts                                |  |
| Number of contacts                     | 3,6,10,12,20+PE<br>+ 2 additional contacts for safe high voltage connections |
| Electrical data acc. to DIN EN 61 984  |  |
| -Rated current                         | 16A  |
| -Rated voltage                         | 830V   |
| -Rated impulse voltage                 | 8kV  |
| -Pollution degree                      | 3  |
| -Pollution degree 2 also               | 16A 1000V 8kV 2  |
| -or                                    | 16A 720/1250V 8kV 2  |
| -Relay contacts                        | 16A 500V 6kV 3   |
| Rated voltage acc. to UL               | 600V   |
| Relay contacts                         | 250V   |
| Insulation resistance                  | ≥10 <sup>10</sup> Ω  |
| Material                               | polycarbonate  |
| Limiting temperatures                  | -40 ...+125  |
| Flammability acc. to UL 94             | V0   |
| Mechanical working life(mating cycles) | ≥500   |
| Contacts                               |  |
| Material                               | copper alloy   |
| Surface                                | hard-silver plated   |
| Contact resistance                     | ≤3mΩ   |
| Spring terminal                        |  |
| -wire gauge                            | 0.14-2.5mm <sup>2</sup>  |
| -AWG                                   | 26-14  |
| -Stripping length                      | 7-9mm  |

Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

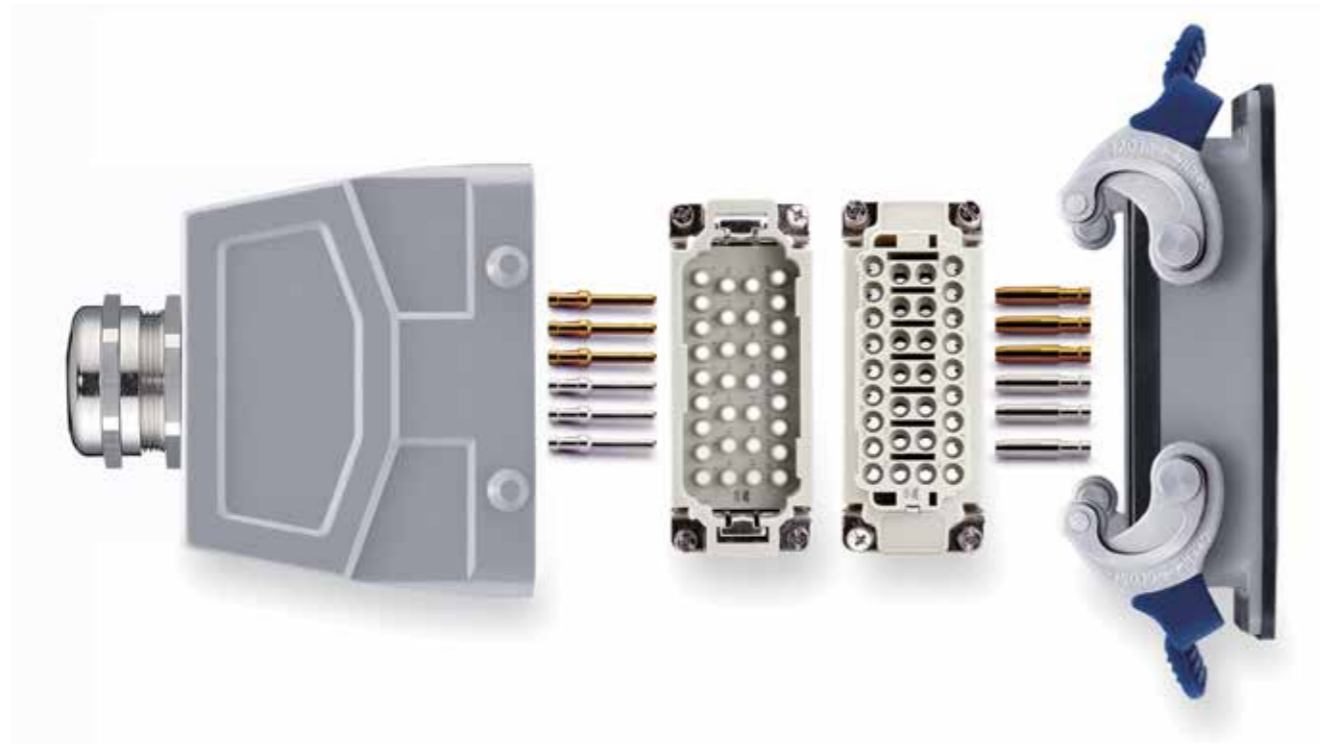
Control and test procedures according to DIN EN 60512-5



HEE SERIES

High density connector

HEE SERIES High density inserts



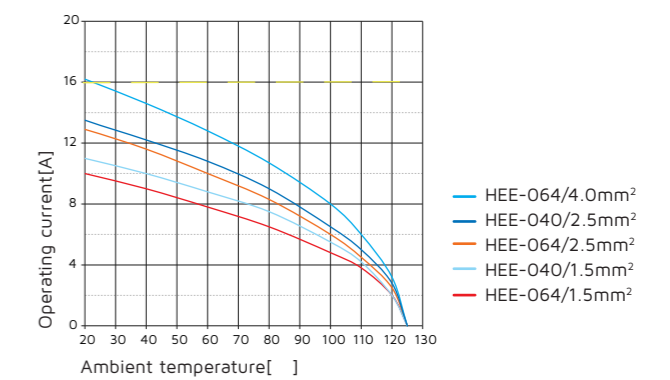
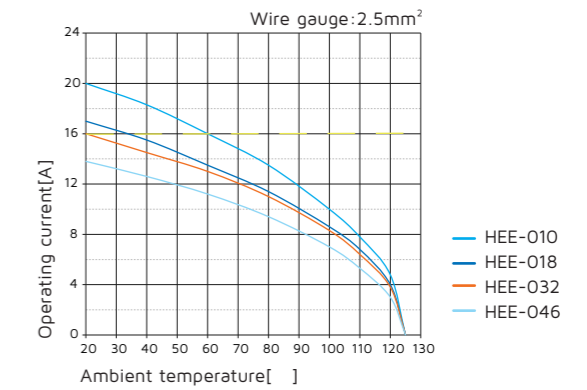
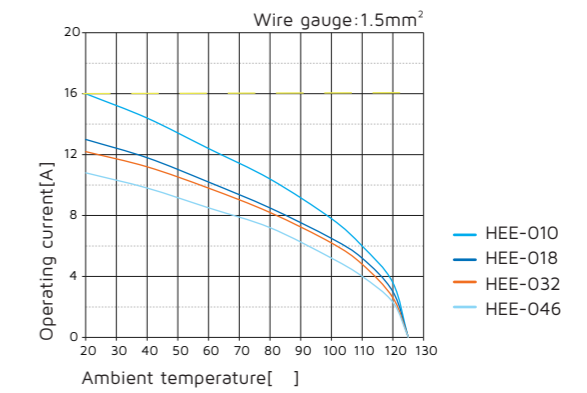
Technical characteristics

|  |  |
|--|--|
| Specifications                           | DIN EN 60 664<br>DIN EN 61 984             |
| Approvals                                | UL, CE, RoHS, REACH                        |
| <b>Inserts</b>                           |  |
| Number of contacts                       | 10,18,32,40,46,64,64(2x32),<br>92(2x46)+PE |
| <b>Electrical data acc. to EN 61 984</b> |  |
| -Rated current                           | 16A  |
| -Rated voltage                           | 500V                                       |
| -Rated impulse voltage                   | 6kV  |
| -Pollution degree                        | 3  |
| -Pollution degree 2 also                 | 16A 830V 8kV 2                             |
| Rated voltage acc. to UL                 | 600V                                       |
| Insulation resistance                    | $\geq 10^{10}\Omega$                       |
| Material                                 | polycarbonate                              |
| Limiting temperatures                    | -40 ... +125                               |
| Flammability acc. to UL 94               | V0   |
| Mechanical working life(mating cycles)   | $\geq 500$                                 |
| <b>Contacts</b>                          |  |
| Material                                 | copper alloy                               |
| Surface                                  | hard-gold plated<br>hard-silver plated     |
| Contact resistance                       | $\leq 1m\Omega$                            |
| <b>Crimp terminal</b>                    |  |
| -Wire gauge                              | 0.14-4.0mm <sup>2</sup>                    |
| -AWG                                     | 26-12                                      |
| -Stripping length                        | 7.5mm                                      |

Current carrying capacity

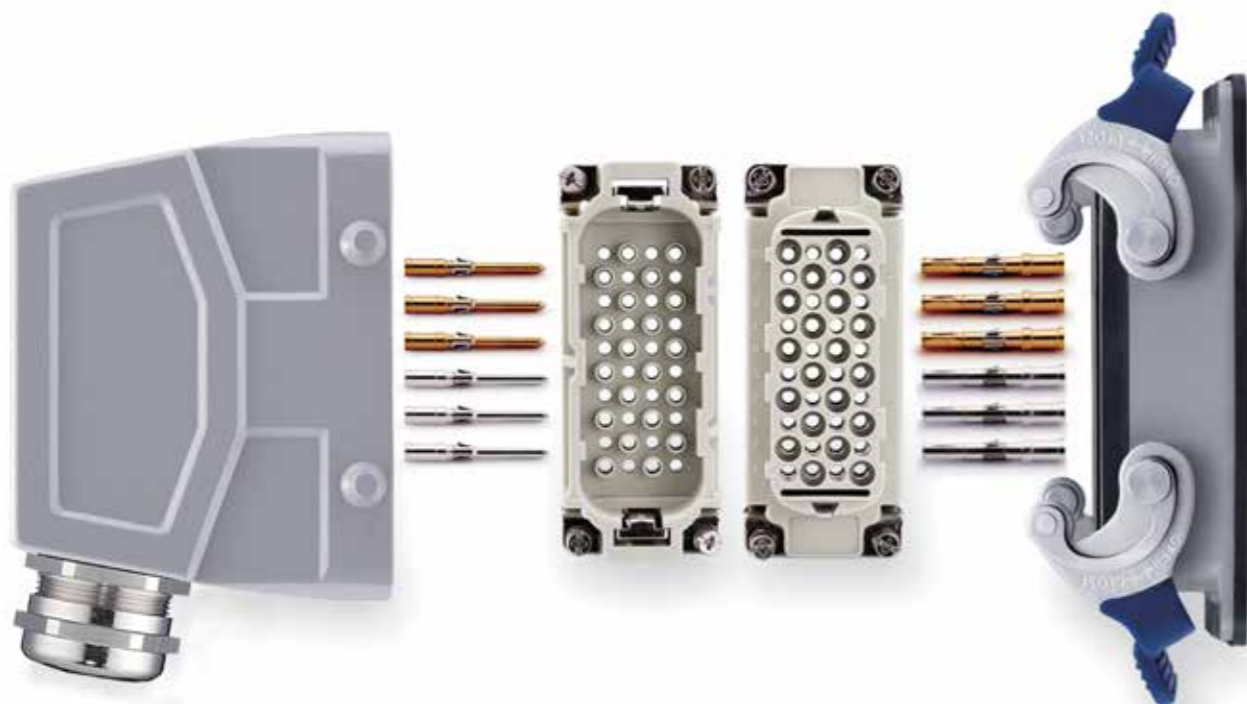
The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5



HD HDD SERIES

Ultra-high density connector



HD SERIES Ultra-high density inserts

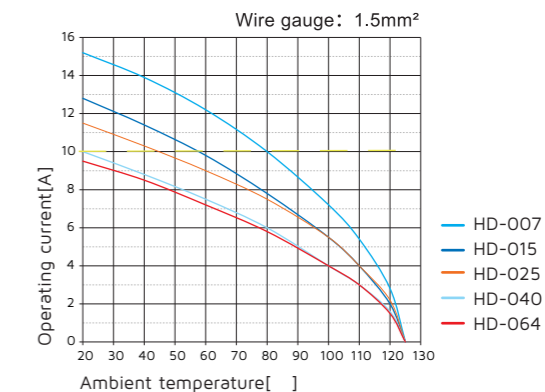
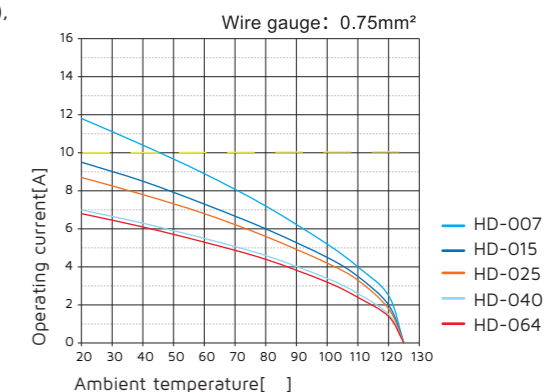
Technical characteristics

|  |  |
|--|--|
| Specifications                         | DIN EN 60 664<br>DIN EN 61 984                     |
| Approvals                              |  |
| Inserts                                |  |
| Number of contacts                     | 7,8,15,25,40,50(25x2),64,80(40x2),<br>128(64x2)+PE |
| Electrical data acc. to EN 61 984      |  |
| -Rated current                         | 10A  |
| -Rated voltage                         | 250V   |
| -Rated impulse voltage                 | 4kV  |
| -Pollution degree                      | 3  |
| -Pollution degree 2 also               | 10A 230/400V 4kV 2                                 |
| -Rated voltage acc. to UL              | 600V   |
| HD-008 Electrical data                 |  |
| -Rated current                         | 10A  |
| -Rated voltage                         | -50V/-120V   |
| -Rated impulse voltage                 | 0.8kV  |
| -Pollution degree                      | 3  |
| -Rated voltage acc. to UL              | 50V  |
| -Rated voltage(direct voltage)         | 120V   |
| Insulation resistance                  | ≥10 <sup>10</sup> Ω                                |
| Material                               | polycarbonate                                      |
| Limiting temperatures                  | -40 ...+125  |
| Flammability acc. to UL 94             | V0   |
| Mechanical working life(mating cycles) | ≥500   |
| Contacts                               |  |
| Material                               | copper alloy                                       |
| Surface                                | hard-gold plated<br>hard-silver plated             |
| Contact resistance                     | ≤3mΩ   |
| Crimp terminal                         |  |
| -Wire gauge                            | 0.14-2.5mm <sup>2</sup>                            |
| -AWG                                   | 26-14  |
| Contacts                               |  |
| Material                               | copper alloy                                       |
| Surface                                | hard-gold plated<br>hard-silver plated             |
| Contact resistance                     | ≤3mΩ   |
| Crimp terminal                         |  |
| -Wire gauge                            | 0.14-2.5mm <sup>2</sup>                            |
| -AWG                                   | 26-14  |
| Stampede contacts                      |  |
| Material                               | copper alloy                                       |
| Surface                                | hard-silver plated                                 |
| Contact resistance                     | ≤5mΩ   |
| Crimp terminal                         |  |
| -Wire gauge                            | 0.5-1.5mm <sup>2</sup> /1.5-2.5mm <sup>2</sup>     |
| -AWG                                   | 20-16/16-14  |
| -Stripping length                      | 6mm  |

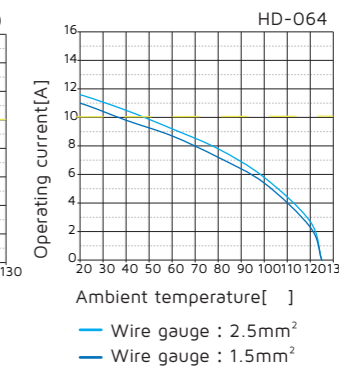
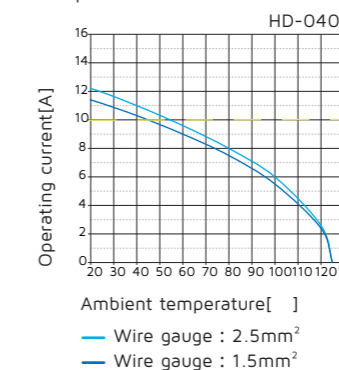
Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5



Stampede contacts:




## HSB SERIES

35A heavy-current connector



## HSB SERIES Heavy-current inserts

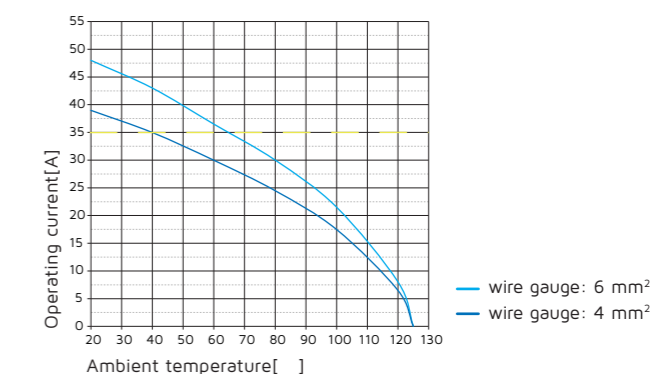
## Technical characteristics

|  |   |
|--|---|
| Technical characteristics              | DIN EN 60 664<br>DIN EN 61 984  |
| Approvals                              |  |
| Inserts                                |   |
| Number of contacts                     | 6,12+PE   |
| Electrical data acc. to EN 61 984      |   |
| -Rated current                         | 35A   |
| -Rated voltage conductor - ground      | 400V  |
| -Rated voltage conductor - conductor   | 690V  |
| -Rated impulse voltage                 | 6kV   |
| -Pollution degree                      | 3   |
| -or                                    | 35A 500V 6kV 3  |
| Rated voltage acc. to UL               | 600V  |
| Insulation resistance                  | $\geq 10^{10}\Omega$  |
| Material                               | polycarbonate   |
| Limiting temperatures                  | -40 ... +125  |
| Flammability acc. to UL 94             | V0  |
| Mechanical working life(mating cycles) | $\geq 500$  |
| Contacts                               |   |
| Material                               | copper alloy  |
| Surface                                | hard-silver plated  |
| Contact resistance                     | $\leq 1\text{m}\Omega$  |
| Screw terminal                         |   |
| - Wire gauge                           | 1.5-6mm <sup>2</sup>  |
| - AWG                                  | 10  |
| - Tightening torque                    | 1.2Nm   |

## Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5






## HK SERIES

Combination connector

## HK SERIES inserts



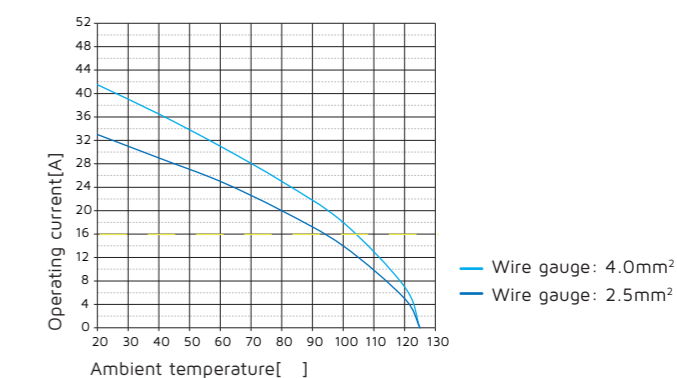
## Technical characteristics

|   |   |
|---|---|
| Specifications                          | DIN EN 60 664<br>DIN EN 61 984  |
| Approvals                               |  |
| Inserts                                 |   |
| Number of contacts                      | 8/24+PE   |
| Electrical data acc. to EN 61 984       |   |
| Power area                              |   |
| -Rated current                          | 16A   |
| -Rated voltage conductor                | 400V  |
| -Rated impulse voltage                  | 6kV   |
| -Pollution degree                       | 3   |
| Signal area                             |   |
| -Rated current                          | 10A   |
| -Rated voltage                          | 250V  |
| -Rated impulse voltage                  | 4kV   |
| -Pollution degree                       | 3   |
| Rated voltage acc. to UL                | 600/300V  |
| Insulation resistance                   | $\geq 10^{10}\Omega$  |
| Material                                | polycarbonate   |
| Limiting temperatures                   | -40 ...+125   |
| Flammability acc. to UL 94              | V0  |
| Mechanical working life (mating cycles) | $\geq 500$  |
| Contacts                                |   |
| Power contacts                          |   |
| -Material                               | copper alloy  |
| -Surface                                | hard-silver plated<br>hard-gold plated  |
| -Contact resistance                     | $\leq 1\text{m}\Omega$  |
| -Crimp terminal                         |   |
| -mm <sup>2</sup>                        | 0.5-4mm <sup>2</sup>  |
| -AWG                                    | 20-12   |
| Signal contacts                         |   |
| -Material                               | copper alloy  |
| -Surface                                | hard-silver plated<br>hard-gold plated  |
| -Contact resistance                     | $\leq 3\text{m}\Omega$  |
| -Crimp terminal                         |   |
| -mm <sup>2</sup>                        | 0.14-2.5mm <sup>2</sup>   |
| -AWG                                    | 25-14   |

## Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5



## HE AV SERIES

Extendible connector, 500V



## HE AV SERIES Extendible inserts, 500V

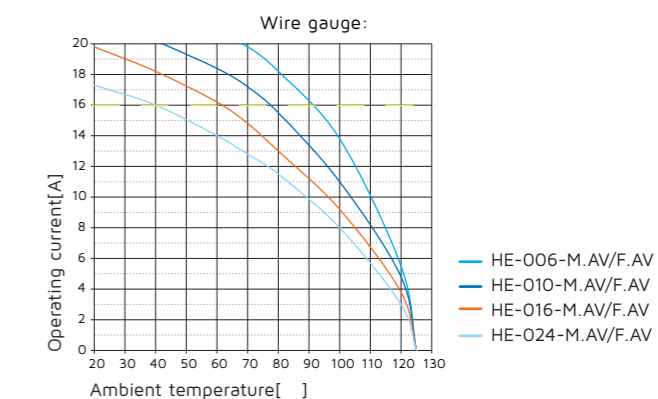
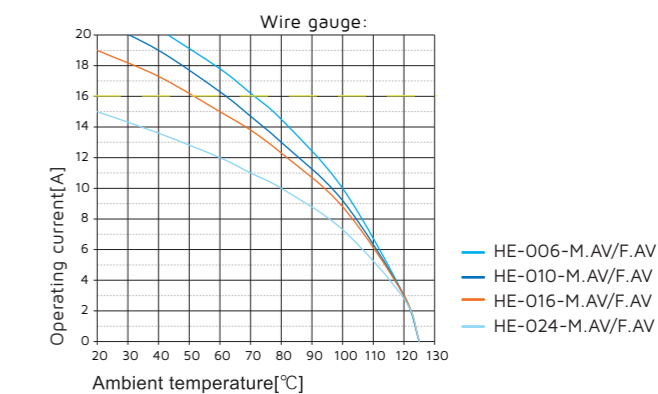
## Technical characteristics

|  |                                |
|--|--------------------------------|
| Specifications                         | DIN EN 60 664<br>DIN EN 61 984 |
| Approvals                              |                                |
| Inserts                                |                                |
| Number of contacts                     | 6,10,16,24+PE                  |
| Electrical data acc. to EN 61 984      |                                |
| -Rated current                         | 16A                            |
| -Rated voltage                         | 500V                           |
| -Rated impulse voltage                 | 6KV                            |
| -Pollution degree                      | 3                              |
| -Pollution degree 2 also               | 16A 400/690V 6kV 2             |
| Rated voltage acc. to UL               | 600V                           |
| Insulation resistance                  | $\geq 10^{10}\Omega$           |
| Material                               | polycarbonate                  |
| Limiting temperatures                  | -40 ... +125                   |
| Flammability acc. to UL 94             | V0                             |
| Mechanical working life(mating cycles) | $\geq 500$                     |
| Contacts                               |                                |
| Material                               | copper alloy                   |
| Surface                                |                                |
| - mating side                          | hard-silver plated             |
| - termination side                     | tin plated                     |
| Contact resistance                     | $\leq 4m\Omega$                |
| Screw terminal                         |                                |
| - Wire gauge                           | 0.2-2.5mm <sup>2</sup>         |
| - AWG                                  | 24-14                          |
| - Tightening/test torque               | 0.5Nm                          |
| Cage clamp terminal                    |                                |
| - Wire gauge                           | 0.14-2.5mm <sup>2</sup>        |
| - AWG                                  | 26-14                          |

## Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5



## HD AV SERIES

Extendible connector, 250V



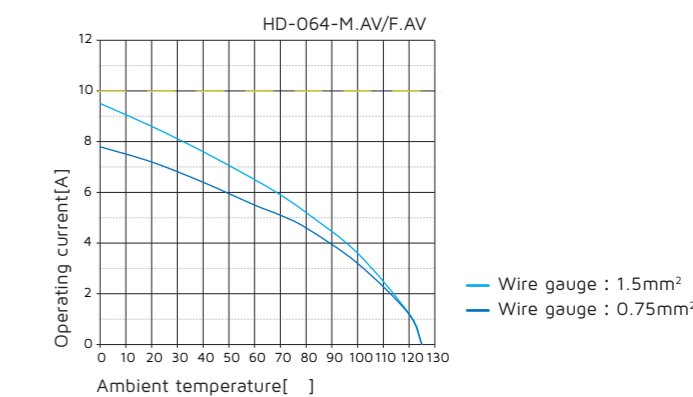
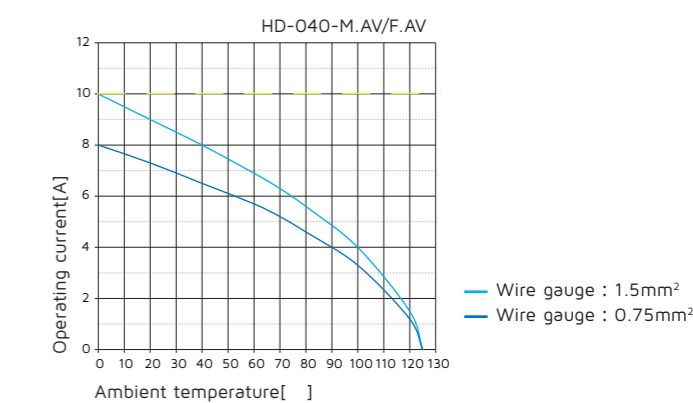
## Technical characteristics

|  |                                |
|--|--------------------------------|
| Specifications                           | DIN EN 60 664<br>DIN EN 61 984 |
| Approvals                                | ERC                            |
| <b>Inserts</b>                           |                                |
| Number of contacts                       | 40,64+PE                       |
| <b>Electrical data acc. to EN 61 984</b> |                                |
| -Rated current                           | 10A                            |
| -Rated voltage                           | 250V                           |
| -Rated impulse voltage                   | 4KV                            |
| -Pollution degree                        | 3                              |
| -Pollution degree 2 also                 | 10A 230/400V 4kV 2             |
| Rated voltage acc. to UL                 | 600V                           |
| Insulation resistance                    | $\geq 10^{10}\Omega$           |
| Material                                 | polycarbonate                  |
| Limiting temperatures                    | -40 ...+125                    |
| Flammability acc. to UL 94               | VO                             |
| Mechanical working life(mating cycles)   | $\geq 500$                     |
| <b>Contacts</b>                          |                                |
| Material                                 | copper alloy                   |
| <b>Surface</b>                           |                                |
| - mating side                            | hard-silver plated             |
| - termination side                       | tin plated                     |
| Contact resistance                       | $\leq 10m\Omega$               |
| <b>Screw terminal</b>                    |                                |
| - Wire gauge                             | 0.2-2.5mm <sup>2</sup>         |
| - AWG                                    | 24-14                          |
| - Tightening/test torque                 | 0.5Nm                          |

## Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5



## HM SERIES

Flexible and combined connector



## HM SERIES Flexible and combined inserts

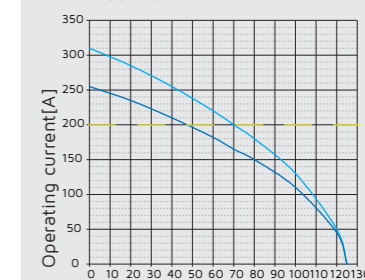
## Technical characteristics

|                                   |                                |                             |                      |
|-----------------------------------|--------------------------------|-----------------------------|----------------------|
| Specifications                    | DIN EN 60 664<br>DIN EN 61 984 |                             |                      |
| Approvals                         | C E T E                        |                             |                      |
| Inserts                           |                                | Contacts                    |                      |
| Number of contacts                | 1                              | Material                    | copper alloy         |
| Electrical data acc. to EN 61 984 |                                | Surface                     | hard-silver plated   |
| -Rated current                    | 200A                           | Contact resistance          | 0.2mΩ                |
| -Rated voltage                    | 1000V                          | For stranded wire according |                      |
| -Rated impulse voltage            | 8kV                            | to IEC 60 228 Class 5       |                      |
| -Pollution degree                 | 3                              | Screw terminal              |                      |
| Rated voltage acc. to UL          | 600V                           | - Wire gauge                | 25-70mm <sup>2</sup> |
| Insulation resistance             | ≥10 <sup>10</sup> Ω            | - AWG                       | 2-0                  |
| Material                          | polycarbonate                  | - Hexagonal driver          | SW 5                 |
| Limiting temperatures             | -40 ... +125                   | - Stripping length          | 16mm                 |
| Flammability acc. to UL 94        | V0                             | - Tightening torque         |                      |
| Mechanical working life           |                                | -mm <sup>2</sup>            | 25 35 50 70          |
| - mating cycles                   | ≥500                           | -Nm                         | 8 8 9 10             |

## Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5




Ambient temperature [ °C ]

— 24 B hoods/housings with 3 modules , wire gauge : 70mm<sup>2</sup>  
 — 24 B hoods/housings with 3 modules , wire gauge : 50mm<sup>2</sup>

1) See P00-33-00-34 for the structural characteristics and description of Axial screw terminal.



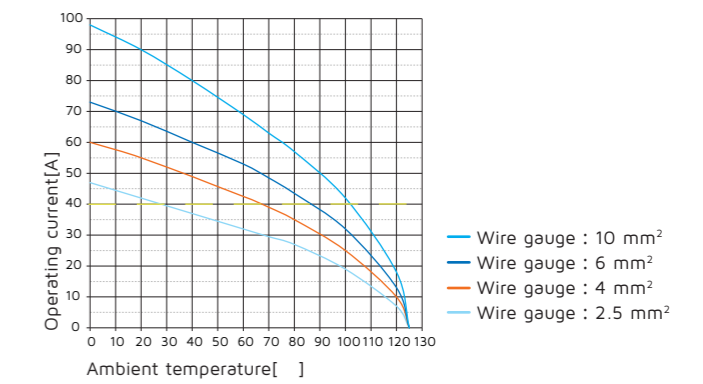
### Technical characteristics

|   |  |
|---|--|
| Specifications  | DIN EN 60 664<br>DIN EN 61 984   |
| Approvals   |  ENEC |
| <b>Inserts</b>  |  |
| Number of contacts  | 2+PE   |
| <b>Electrical data acc. to EN 61 984</b>                          |  |
| -Rated current  | 40A  |
| -Rated voltage  | 830V   |
| -Rated impulse voltage  | 6kV  |
| -Pollution degree   | 3  |
| Rated voltage acc. to UL  | 600V   |
| Insulation resistance   | $\geq 10^{10}\Omega$   |
| Material polycarbonate  | polycarbonate  |
| Limiting temperatures   | -40 ... +125   |
| Flammability acc. to UL 94  | V0   |
| Mechanical working life(mating cycles)                            | $\geq 500$   |
| <b>Contacts</b>   |  |
| Material  | copper alloy   |
| Surface   | hard-silver plated   |
| Contact resistance  | $\leq 1m\Omega$  |
| <b>Axial screw termination</b>                                    |  |
| - mm <sup>2</sup>   | 2.5-10mm <sup>2</sup>  |
| - AWG   | 14-8   |
| Tightening torque   | 1.8Nm  |
| Stripping length  | 8mm <sup>-1</sup>  |
| <b>Hoods/Housings</b>   |  |
| <b>Plastic hoods/housings</b>                                     |  |
| -Material   | polycarbonate  |
| -Flammability acc. to UL 94                                       | V0   |
| -Degree of protection acc. to DIN EN 60 529 for coupled connector | IP65   |
| <b>Hoods/Housings, metal</b>                                      |  |
| -Material   | zinc die-cast  |
| -Degree of protection acc. to DIN EN 60 529 for coupled connector | IP65/IP68  |

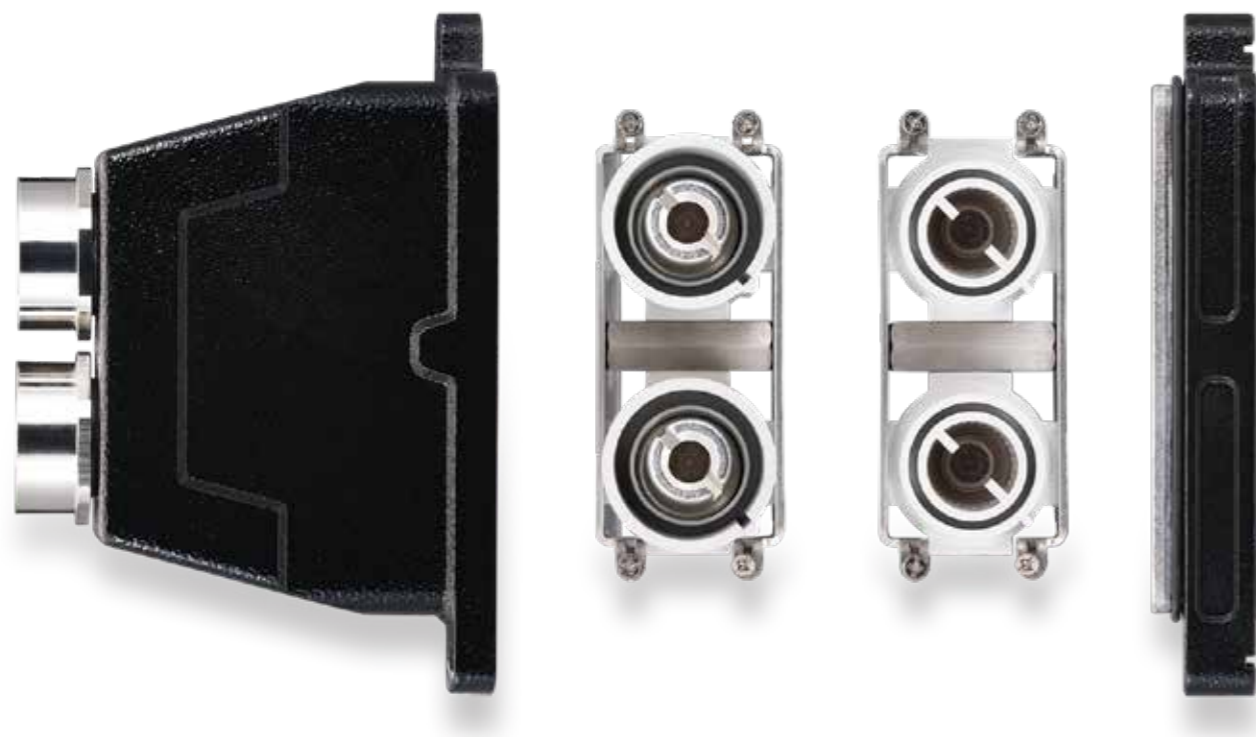
### Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5



Modular Heavy-current connector



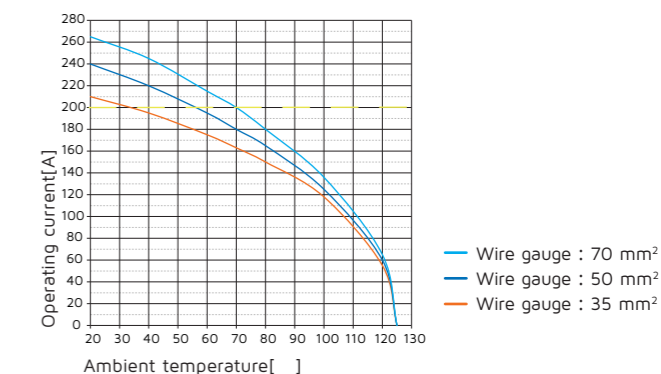
Technical characteristics

|  |                                |
|--|--------------------------------|
| Specifications                               | DIN EN 60 664<br>DIN EN 61 984 |
| Approvals                                    | CE                             |
| <b>Inserts</b>                               |                                |
| Number of contacts                           | 3/0+PE, 3/2+PE                 |
| Electrical data acc. to EN 61 984            |                                |
| <b>Power area</b>                            |                                |
| -Rated current                               | 200A                           |
| -Rated voltage conductor                     | 1150/2000V                     |
| -Rated impulse voltage                       | 8kV                            |
| -Pollution degree                            | 3                              |
| Pollution degree 2 also                      | 200A 2000V 12kV 2              |
| <b>Signal area</b>                           |                                |
| -Rated current                               | 16A                            |
| -Rated voltage                               | 400V                           |
| -Rated impulse voltage                       | 6kV                            |
| -Pollution degree                            | 3                              |
| Pollution degree 2 also                      | 16A 500V 6kV 2                 |
| Insulation resistance                        | ≥10 <sup>10</sup> Ω            |
| Material                                     | polycarbonate                  |
| Limiting temperatures                        | -40 ...+125                    |
| Flammability acc. to UL 94                   | V0                             |
| Mechanical working life(mating cycles)       | ≥500                           |
| <b>Contacts</b>                              |                                |
| Material                                     | copper alloy                   |
| Surface                                      | silver                         |
| Contact resistance                           | ≤0.2mΩ                         |
| For stranded wire acc. to IEC 60 228 Class 5 |                                |
| Axial screw termination                      |                                |
| <b>Power contacts</b>                        |                                |
| - Wire gauge                                 | 35-70mm <sup>2</sup>           |
| - AWG  | 2-00                           |
| - Hexagonal driver                           | SW5                            |
| - Stripping length                           | 22mm                           |
|  | mm <sup>2</sup> 35 50 70       |
| - Tightening torque                          | N.m 8 9 10                     |
| <b>PE contact</b>                            |                                |
| - Wire gauge                                 | 16-35mm <sup>2</sup>           |
| - AWG  | 5-2                            |
| - Hexagonal driver                           | SW4                            |
| - Stripping length                           | 14mm                           |
| - Tightening torque                          | 6Nm                            |
| <b>Signal contact (only HK 3/2)</b>          |                                |
| - Wire gauge                                 | 2.5mm <sup>2</sup>             |
| - AWG  | 14                             |
| - Stripping length                           | 7mm                            |
| - Tightening torque                          | 0.5Nm                          |

Current carrying capacity

The current carrying is limited by maximum temperature of materials for inserts and contacts including terminals

Control and test procedures according to DIN EN 60512-5



24B Pressure tight hoods/housings with 1 modules