98 42 914 0201

Pushing Performance

HARTING News 2012

People | Power | Partnership

Transforming customer wishes into concrete solutions

The HARTING Technology Group is skilled in the fields of electrical, electronic and optical connection, transmission and networking, as well as in manufacturing, mechatronics and software creation. The Group uses these skills to develop customized solutions and products such as connectors for energy and data transmission applications including, for example, mechanical engineering, rail technology, wind energy plants, factory automation and the telecommunications sector. In addition, HARTING also produces electro-magnetic components for the automobile industry and offers solutions in the field of Enclosures and Shop Systems.
The HARTING Group currently comprises 36 subsidiary companies and worldwide distributors employing a total of approx. 3,400 staff.

HARTING Subsidiary company HARTING Representatives

We aspire to top performance.

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

Always at hand, wherever our customers may be.

Increasing industrialization is creating growing markets characterized by widely diverging demands and requirements. The search for perfection, increasingly efficient processes and reliable technologies is a common factor in all sectors across the globe.

HARTING is providing these technologies – in Europe, America and Asia. The **HARTING** professionals at our international subsidiaries engage in close, partnership based interaction with our customers, right from the very early product development phases, in order to realize customer demands and requirements in the best possible manner.

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

Our claim: Pushing Performance.

HARTING provides more than optimally attuned components. In order to serve our customers with the best possible solutions, **HARTING** is able to contribute a great deal more and play a closely integrative role in the value creation process.

From ready assembled cables through to control racks or ready-to-go control desks: Our aim is to generate the maximum benefits for our customers – without compromise!

Quality creates reliability – and warrants trust.

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

EN ISO 9001, the EU Eco-Audit and ISO 14001:2004 are key elements here. We take a proactive stance to new requirements, which is why **HARTING** ranks among the first companies worldwide to have obtained the new IRIS quality certificate for rail vehicles.

HARTING technology creates added value for customers.
Technologies by **HARTING** are at work worldwide. **HARTING**'s presence stands for smoothly functioning systems, powered by intelligent connectors, smart infrastructure solutions and mature network systems. In the course of many years of close, trust-based cooperation with its customers, the **HARTING** Technology Group has advanced to one of the worldwide leading specialists for connector technology. Extending beyond the basic functionalities demanded, we offer individual customers specific and innovative solutions. These tailored solutions deliver sustained effects, provide investment security and enable customers to achieve strong added value.

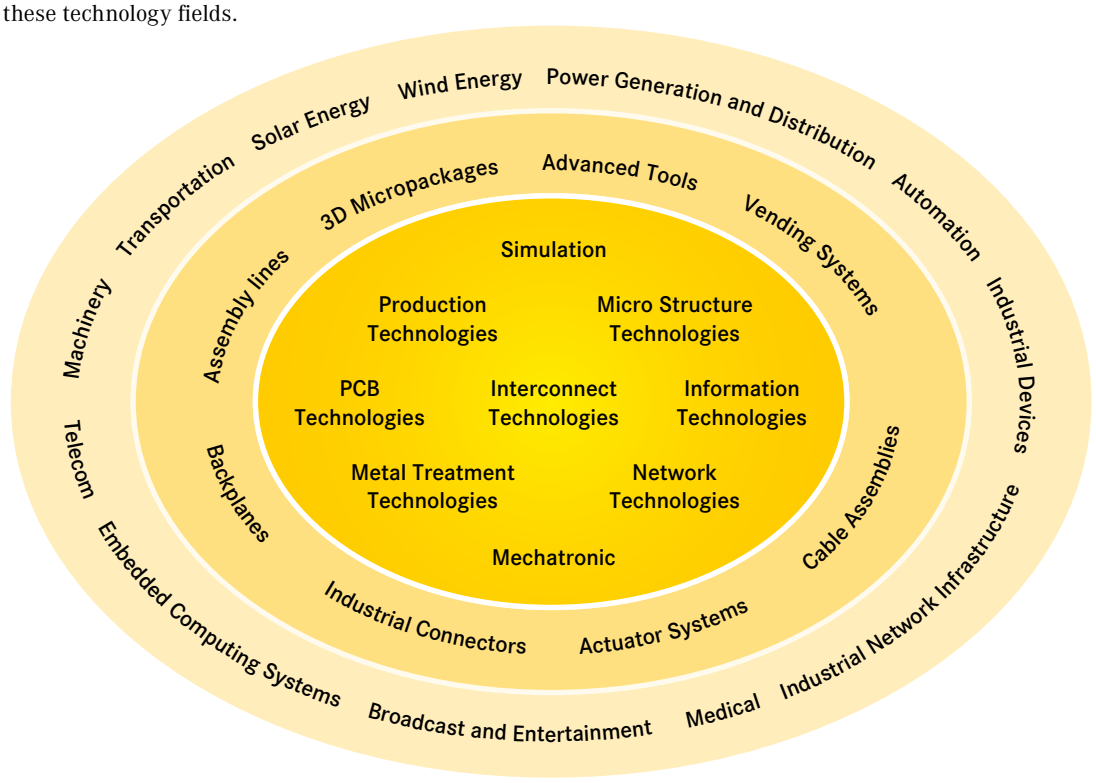
Opting for HARTING opens up an innovative, complex world of concepts and ideas.
In order to develop connectivity and network solutions serving an exceptionally wide range of connector applications and task scopes in a professional and cost optimized manner, **HARTING** not only commands the full array of conventional tools and basic technologies. Over and beyond these capabilities, **HARTING** is constantly harnessing and refining its broad base of knowledge and experience to create new solutions that ensure continuity at the same time. In securing this know-how lead, **HARTING** draws on a wealth of sources from both in-house research and the world of applications alike.
Salient examples of these sources of innovative knowledge include microstructure technologies, 3D design and construction technology, as well as high temperature or ultrahigh frequency applications that are finding use in telecommunications or automation networks, in the automotive industry, or in industrial sensor and actuator applications, RFID and wireless technologies, in addition to packaging and housing made of plastics, aluminum or stainless steel.

HARTING solutions extend across technology boundaries.
Drawing on the comprehensive resources of the group's technology pool, **HARTING** devises practical solutions for its customers. Whether this involves industrial networks for manufacturing automation, or hybrid interface solutions for wireless telecommunication infrastructures, 3D circuit carriers with microstructures, or cable assemblies for high-temperature applications in the automotive industry – **HARTING** technologies offer far more than components, and represent mature, comprehensive solutions attuned to individual customer requirements and wishes. The range covers ready-to-use cable configurations, completely assembled backplanes and board system carriers, as well as fully wired and tested control panels.
In order to ensure the future proof design of RF- and EMC-compatible interface solutions, the central **HARTING** laboratory (certified to EN 45001) provides simulation tools, as well as experimental, testing and diagnostics facilities all the way through to scanning electron microscopes. In the selection of materials and processes, lifecycle and environmental aspects play a key role, in addition to product and process capability considerations.

HARTING knowledge is practical know-how generating synergy effects.

HARTING commands decades of experience with regard to the applications conditions of connectors in telecommunications, computer and network technologies and medical technologies, as well as industrial automation technologies, such as the mechanical engineering and plant engineering areas, in addition to the power generation industry or the transportation sector. HARTING is highly conversant with the specific application areas in all of these technology fields.

The key focus is on applications in every solution approach. In this context, uncompromising, superior quality is our hallmark. Every new solution found will invariably flow back into the HARTING technology pool, thereby enriching our resources. And every new solution we go on to create will draw on this wealth of resources in order to optimize each and every individual solution. In this way, HARTING is synergy in action.



Contents

Contents

Contents

Contents

Han-Fast® Lock

Features

- Solder free PCB termination
- PCB contact with locking element
- Stamped contact element
- Automatic crimping process compatible
- For use with different Han® connectors
- Cost-effective
- Easy handling
- Fast assembly to PCB
- Contacts with pin
  - Locking directly on the PCB
- Contacts without pin
  - Fast positioning with plastic adapter

Technical characteristics

Contact	
Material	Copper alloy
- Hard silver plated	3 µm Ag
Contact resistance	< 2 mΩ
Locking	
Material	Copper alloy
Surface finish	Passivation
Current 10 mm² stranded wire	60 A
Voltage	Clearance and creepage distances have to be considered
Board density	t= 1.6 - 2.0 mm

Description

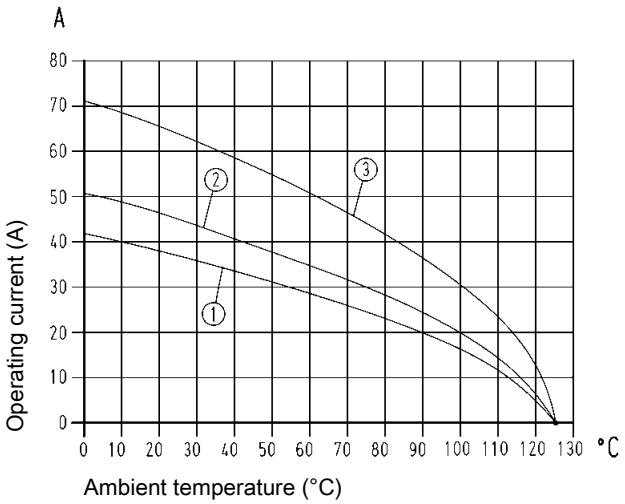
The new connection of wires to the PCB offers optimized PCB design, combined with outstanding contact qualities. The Han-Fast® Lock is flexible and allows a fast and simple PCB connection. The PCB has one drilled hole and a pad. The inner surface of the plated drilled hole serves as the interface.
The Han-Fast® Lock is simply inserted into the plated through contact hole. The locking pin is pushed in and hence locks the contact into position. The solder free connection technique is easy to handle and to operate. Maintenance has been made simple with the facility to detach the contact. Han-Fast® Lock also supports SMD assembly of the PCB.

- Current up to 60 Amps
- Standard drilled hole with pad
- Position independent of connector
- Solder free PCB termination
- Easy locking solution

Current carrying capacity

The current carrying capacity of the connectors is limited by the thermal load capability of the contact element material including the connections and the insulating parts. The derating curve is therefore valid for currents which flow constantly (non-intermittent) through each contact element of the connector evenly, without exceeding the allowed maximum temperature.

Measuring and testing techniques according to
DIN EN 60 512-5



① Wire gauge: 4 mm²
② Wire gauge: 6 mm²
③ Wire gauge: 10 mm²

Han-Fast® Lock

Available June 2012

Identification	Part-Number	Drawing	Dimensions in mm
Contacts with pin on a reel			
4.0 up to 6.0 mm²	09 08 000 6123		
10.0 mm²	09 08 000 6124		
Contacts without pin on a reel			
4.0 up to 6.0 mm²	09 08 000 6923		
10.0 mm²	09 08 000 6924		
Further plated surfaces on request			
Single contacts with pin			
4.0 up to 6.0 mm²	09 08 000 7123		
10.0 mm²	09 08 000 7124		
Single contacts without pin			
4.0 up to 6.0 mm²	09 08 000 7923		
10.0 mm²	09 08 000 7924		
Further plated surfaces on request			

Han-Yellock® 10 Hoods/Housings

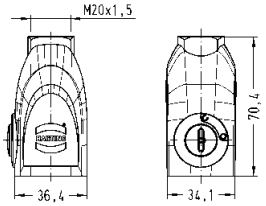
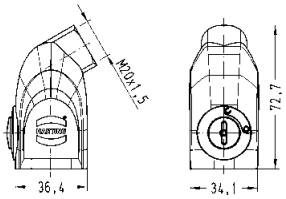
Features

- Compatible with all inserts size Han® 3 A
- High robustness via an internal locking mechanism
- Optimal EMC properties
- High quality industrial design
- With entry for M20 or M25 cable glands

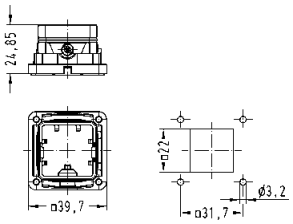
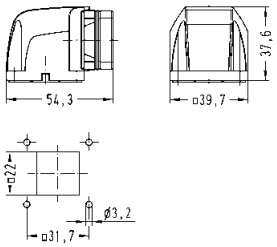
Technical characteristics

Material	zinc die-cast
Surface	
Hood	Epoxy powder paint
Housings bulkhead mounting	zinc passivation
Locking element	PA / stainless steel
Limiting temperatures	-40 °C ... +125 °C
Un-/Locking temperatures	-10 °C ... +85 °C
Degree of protection acc. to DIN EN 60 529	
for coupled connector	IP 65 / IP 67
Tightening torque	
M3 fixing screw	1 Nm

Hoods Han-Yellock®

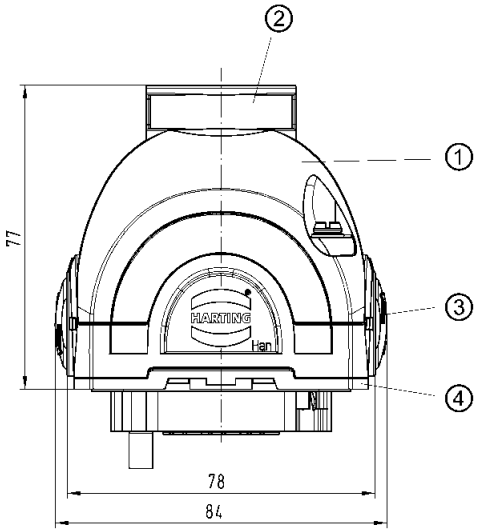
Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hood top entry Han-Yellock® 10 	11 20 003 1400 11 20 003 1401	M20 M25		
Hood angled entry Han-Yellock® 10 	11 20 003 1600 11 20 003 1601	M20 M25		

Housings Han-Yellock®

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings bulkhead mounting				
Han-Yellock® 10 	11 20 003 0300			
Han-Yellock® 10 	11 20 003 0800			

Features

- Two-part hoods for easy wiring and testing
- High robustness via an internal locking mechanism
- Earthed contacts PE in crimped or Quick Lock termination technique
- Protection cover retrofit on housing side



① Shell with top entry
② Thread M20 ... M40
③ Carrier hood with push button release
④ Housings bulkhead mounting

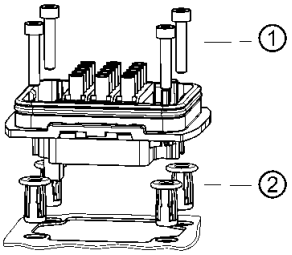
Technical characteristics

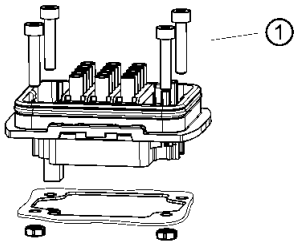
Shells and Housings, surface mounting

Material	aluminium die-cast
Surface	Epoxy powder paint
Locking element	stainless steel
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529	
for coupled connector	IP 65 / IP 67
Tightening torque	
M4 fixing screw	1.2 Nm ... 2,0 Nm

Carrier hoods and Housings, bulkhead mounting

Number of Han-Yellock® modules	
Han-Yellock® 30	3
Han-Yellock® 60	6
Material	zinc die-cast
Surface	zinc passivation
Locking element	PA / stainless steel
Hoods/Housings seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Un-/Locking temperatures	-10 °C ... +85 °C
Degree of protection acc. to DIN EN 60 529	
for coupled connector	IP 65 / IP 67
Mechanical working life	
- mating cycles	< 500
PE contact	
wire gauge	≤ 4 mm²
Tightening torque	
M4 fixing screw	1 Nm
panel fastener	2.3 Nm



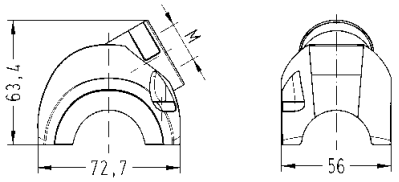
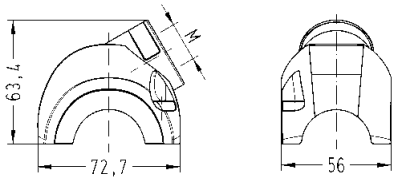
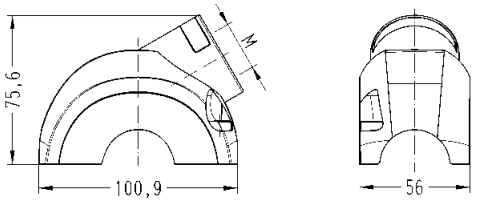
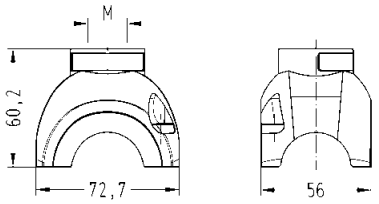
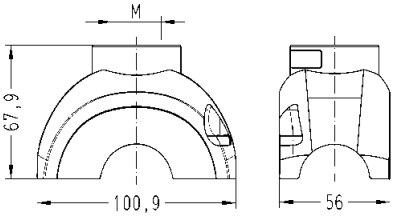
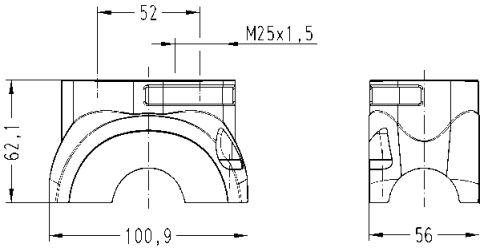


① M4 fixing screw (screw length > 20 mm)
② panel fastener

Protection covers

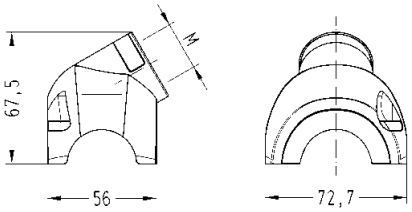
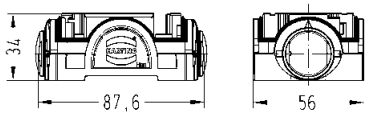
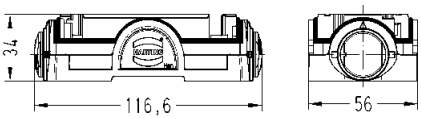
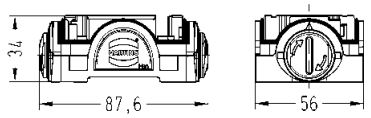
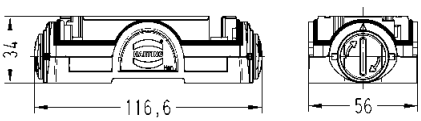
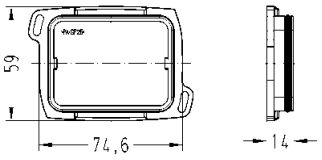
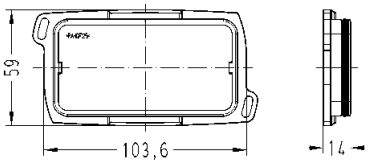
Material	PA
Hoods/Housings seal	NBR
Degree of protection acc. to DIN EN 60 529	
for coupled connector	IP 65 / IP 67
Flammability acc. to UL 94	

Hoods Han-Yellock®

Identification		Part number	Cable entry	Drawing	Dimensions in mm
Shell side-entry					
Han-Yellock® 30		**11 12 300 1500**	M20		
		11 12 300 1501	M25		
		11 12 300 1502	M32		
Han-Yellock® 30 white		11 12 300 1510	M20		
Han-Yellock® 60		**11 12 600 1501**	M25		
		11 12 600 1502	M32		
		11 12 600 1503	M40		
Shell top entry					
Han-Yellock® 30		**11 12 300 1400**	M20		
		11 12 300 1401	M25		
		11 12 300 1402	M32		
Han-Yellock® 60		**11 12 600 1401**	M25		
		11 12 600 1402	M32		
		11 12 600 1403	M40		
Han-Yellock® 60		**11 12 600 1411**	2x M25		
		11 12 600 1415	1x M20 1x M25		

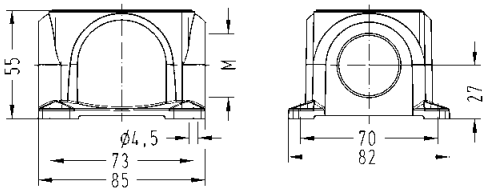
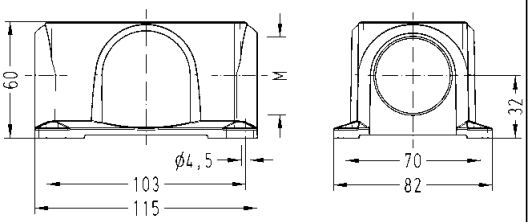
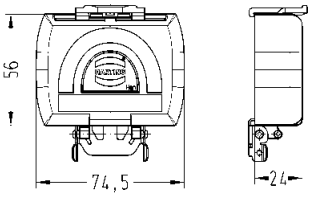
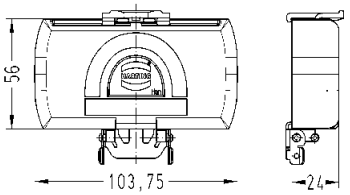
Stock items in bold type

Hoods Han-Yellock®

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Shell angled entry Han-Yellock® 30 	**11 12 300 1600** **11 12 300 1601** **11 12 300 1602**	M20 M25 M32		
Carrier hood plain push button Han-Yellock® 30 	**11 12 300 0100**			
Han-Yellock® 60 	**11 12 600 0100**			
Carrier hood push button, slot Han-Yellock® 30 	**11 12 300 0110**			
Han-Yellock® 60 	**11 12 600 0110**			
Protection cover for carrier hoods Han-Yellock® 30 	**11 12 300 5451**			
Han-Yellock® 60 	**11 12 600 5451**			

Stock items in bold type

Housings Han-Yellock®

Identification		Part number	Cable entry	Drawing	Dimensions in mm
Housings surface mounting					
Han-Yellock® 30		11 12 300 1200	M20		
		11 12 300 1201	M25		
		11 12 300 1202	M32		
		11 12 300 1205	2x M25		
		11 12 300 1206	2x M32		
Han-Yellock® 60		11 12 600 1202	M32		
		11 12 600 1203	M40		
		11 12 600 1206	2x M32		
		11 12 600 1207	2x M40		
Protection cover for housings, bulkhead mounting					
Han-Yellock® 30		11 12 300 5401			
Han-Yellock® 60		11 12 600 5401			

Notes

Han-Yellock® Adapter frames

Features

- Flexible design of interfaces with the aid of Han-Modular®
- Snap-in assembly from mating side and from termination side for Han-Yellock® 30 and 60
- Removal from mating side and from termination side possible for Han-Yellock® 30 and 60
- Fast and tool-less assembly
- Mounting of adapter frame Han-Yellock® 20 from termination side only

Technical characteristics

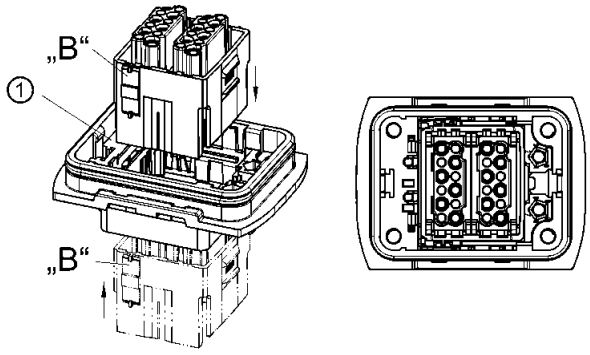
Specifications	DIN EN 60 664-1 DIN EN 61 984

Adapter frames

Number of modules	1 / 2 / 4
Material	PC
Flammability acc. to UL 94	V 0

Assembly

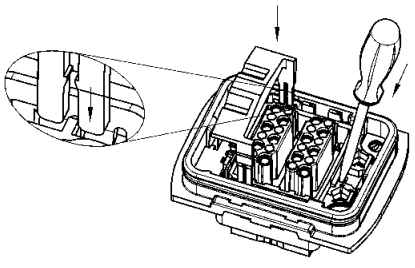
- The adapter frame can be snapped into the housing, bulkhead mounting, on the termination side and the mating side (refer to the illustration).
- The lateral plastic tabs („B“) are pressed into the metal clamps on the housing.
- The adapter frame then snaps in with a distinctly audible click.

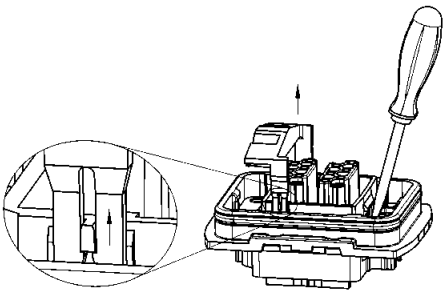


① metal clamp

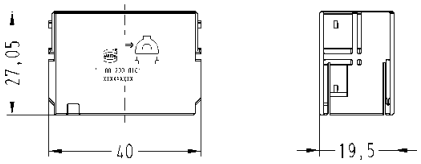
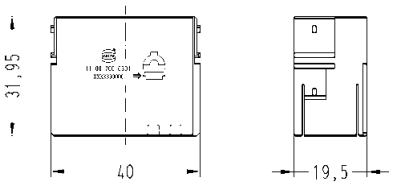
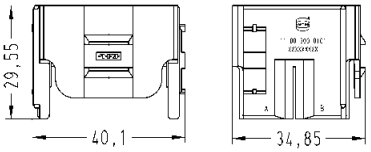
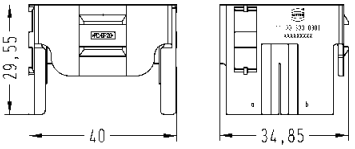
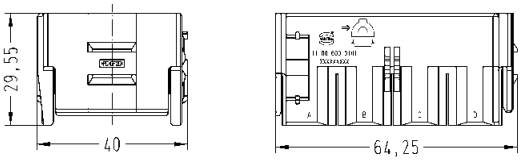
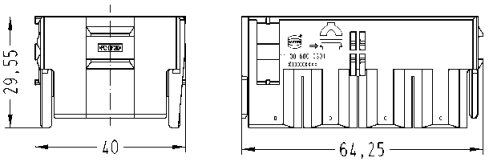
Removal

- The removal tool part no. 11 99 000 0001 is required for disassembly.
- The removal tool is inserted into the metal clamp and pressed down as shown in the following illustration. A screwdriver need also be placed into the notch in the housing.
- The removal tool should then be pulled outwards to remove the adapter frame from the housing.
- The removal can be made from the termination side as well as from the mating side.
- The process is identical for both housings, bulkhead mounting, and carrier hoods.





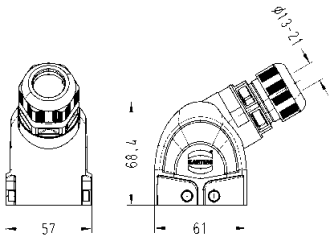
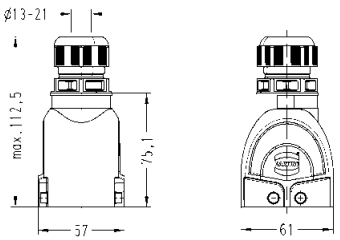
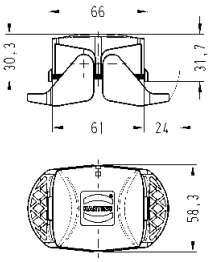
Han-Yellock® Adapter frames

Identification		Part number	Drawing	Dimensions in mm
Han-Yellock® 20 Adapter frames *				
for carrier hoods		**11 00 200 0101**		
for housings, bulkhead mounting		**11 00 200 0301**		
Han-Yellock® 30 Adapter frames				
for carrier hoods		**11 00 300 0101**		
for housings, bulkhead mounting		**11 00 300 0301**		
Han-Yellock® 60 Adapter frames				
for carrier hoods		**11 00 600 0101**		
for housings, bulkhead mounting		**11 00 600 0301**		

* mounting from termination side only

Stock items in bold type

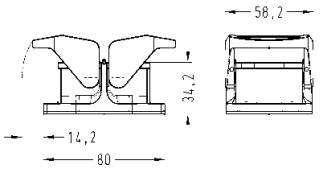
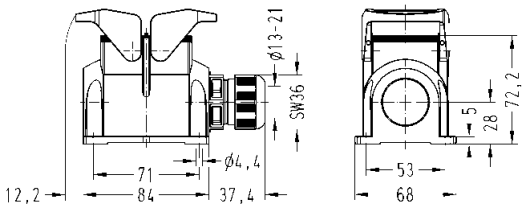
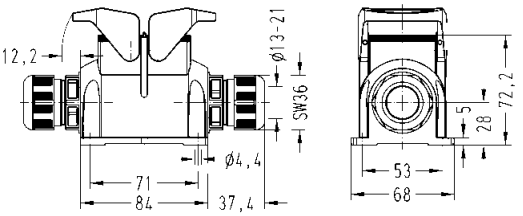
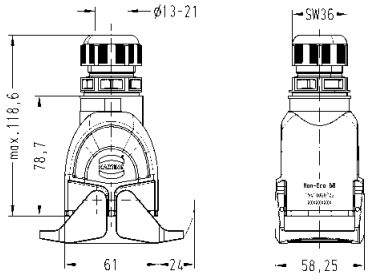
Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hood with integrated cable gland side entry 	**19 41 106 0522**	M32		
Hood with integrated cable gland top entry 	**19 41 106 0422**	M32		
Protection covers for hoods 	**19 41 006 5406**			

Stock items in bold type

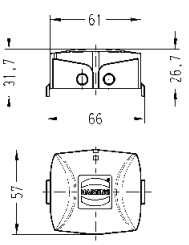
Han-Eco® Hoods/Housings Size 6 B

Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	**19 41 006 0301**			
Housings, surface mounting, with integrated cable gland side entry 	**19 41 106 0232**	M32		
Housings, surface mounting, with integrated cable gland side entries 	**19 41 106 0272**	2x M32		
Hoods, cable to cable, with integrated cable gland top entry 	**19 41 106 0722**	M32		

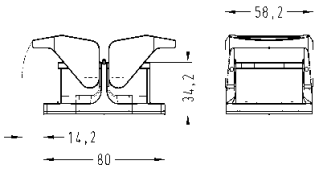
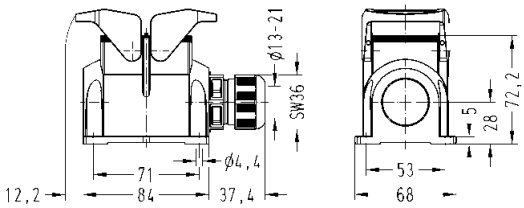
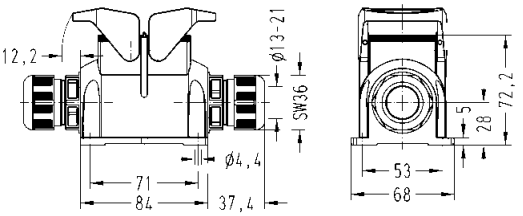
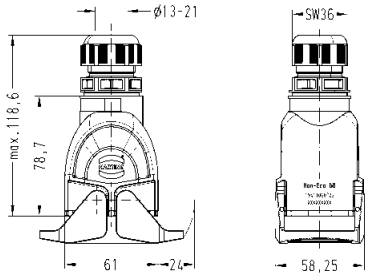
Stock items in bold type

Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Protection covers for housings	**19 41 006 5405**			

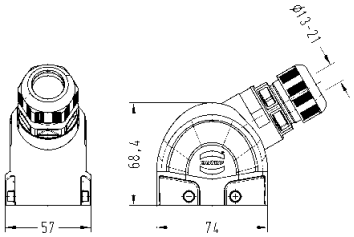
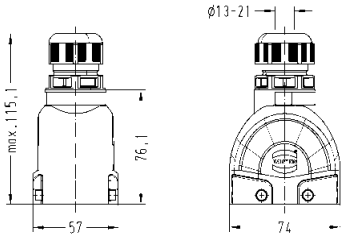
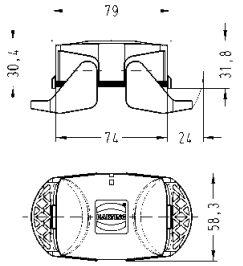
Stock items in bold type

Plastic hoods/housings for outdoor applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	**19 41 206 0301**			
Housings, surface mounting, with integrated cable gland side entry 	**19 41 306 0232**	M32		
Housings, surface mounting, with integrated cable gland side entries 	**19 41 306 0272**	2x M32		
Hoods, cable to cable, with integrated cable gland top entry 	**19 41 306 0722**	M32		

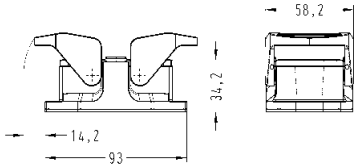
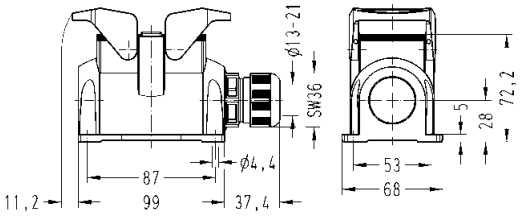
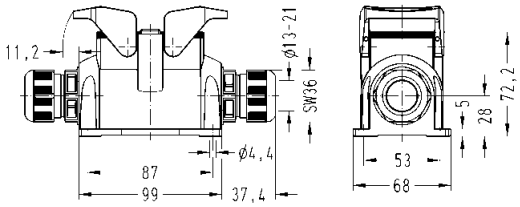
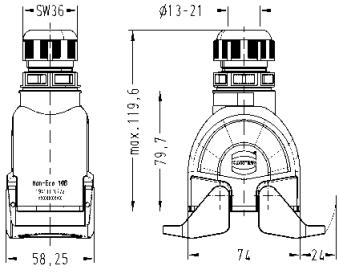
Stock items in bold type

Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hood with integrated cable gland side entry 	**19 41 110 0522**	M32		
Hood with integrated cable gland top entry 	**19 41 110 0422**	M32		
Protection covers for hoods 	**19 41 010 5406**			

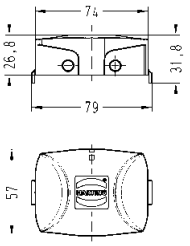
Stock items in bold type

Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	**19 41 010 0301**			
Housings, surface mounting, with integrated cable gland side entry 	**19 41 110 0232**	M32		
Housings, surface mounting, with integrated cable gland side entries 	**19 41 110 0272**	2x M32		
Hoods, cable to cable, with integrated cable gland top entry 	**19 41 110 0722**	M32		

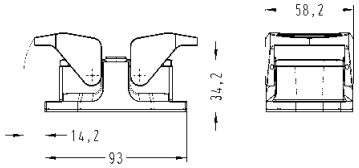
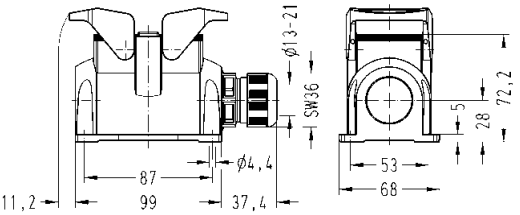
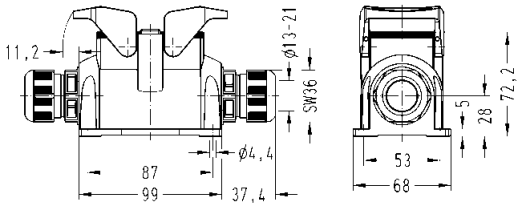
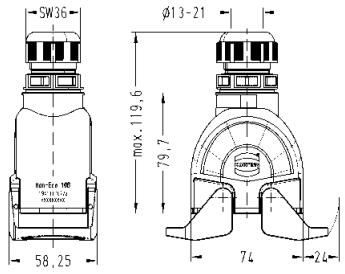
Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Protection covers for housings	**19 41 010 5405**			



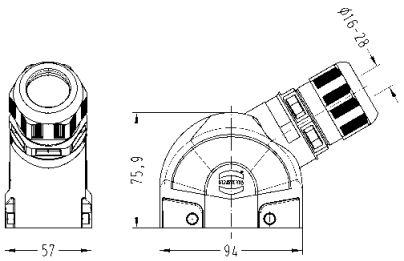
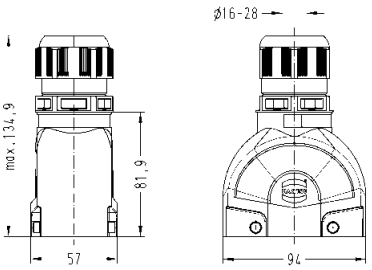
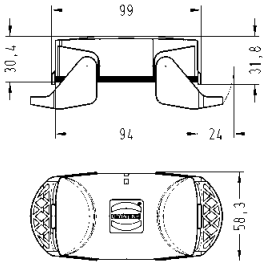
Stock items in bold type

Plastic hoods/housings for outdoor applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	**19 41 210 0301**			
Housings, surface mounting, with integrated cable gland side entry 	**19 41 310 0232**	M32		
Housings, surface mounting, with integrated cable gland side entries 	**19 41 310 0272**	2x M32		
Hoods, cable to cable, with integrated cable gland top entry 	**19 41 310 0722**	M32		

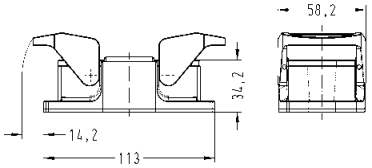
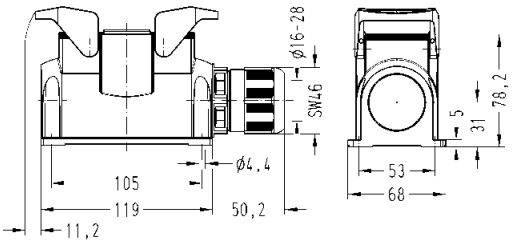
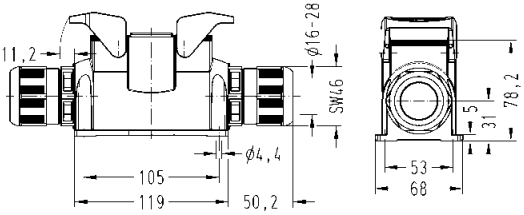
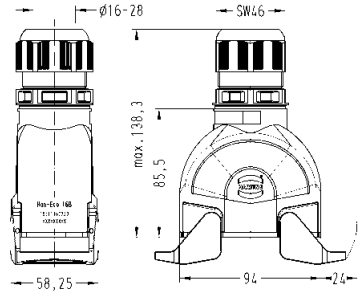
Stock items in bold type

Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hood with integrated cable gland side entry 	**19 41 116 0523**	M40		
Hood with integrated cable gland top entry 	**19 41 116 0423**	M40		
Protection covers for hoods 	**19 41 016 5406**			

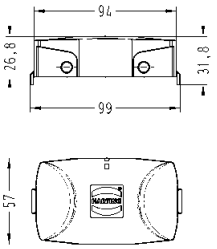
Stock items in bold type

Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	**19 41 016 0301**			
Housings, surface mounting, with integrated cable gland side entry 	**19 41 116 0233**	M40		
Housings, surface mounting, with integrated cable gland side entries 	**19 41 116 0273**	2x M40		
Hoods, cable to cable, with integrated cable gland top entry 	**19 41 116 0723**	M40		

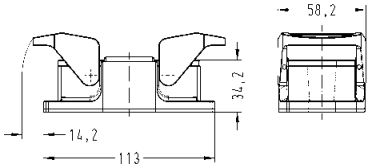
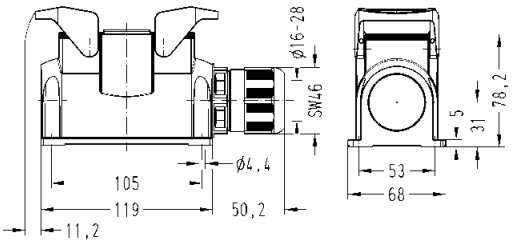
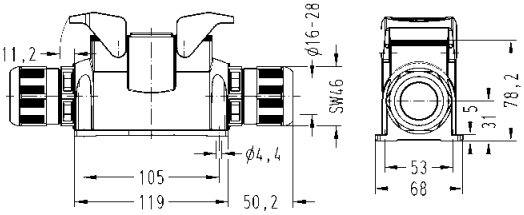
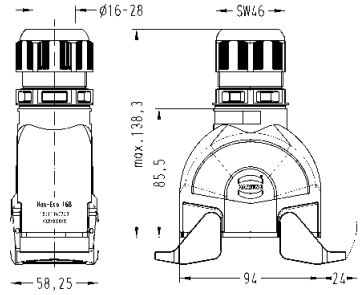
Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Protection covers for housings	**19 41 016 5405**			

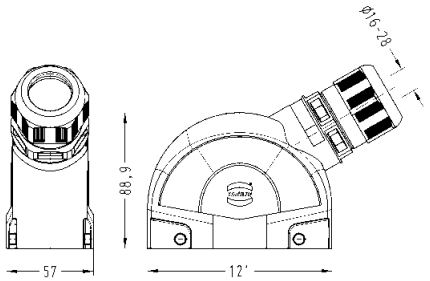
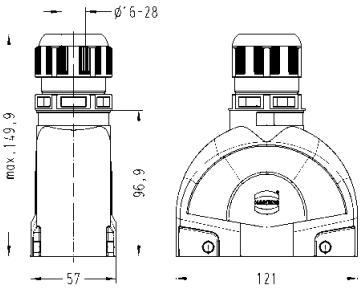
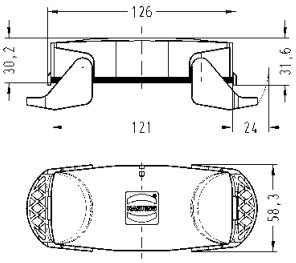


Stock items in bold type

Plastic hoods/housings for outdoor applications / 2 lever locking system

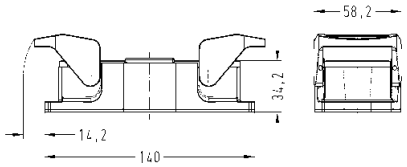
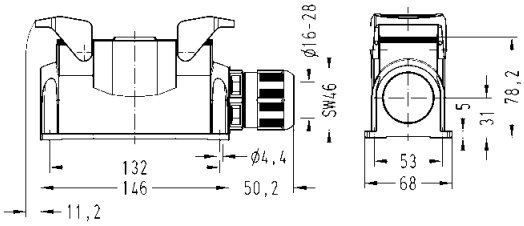
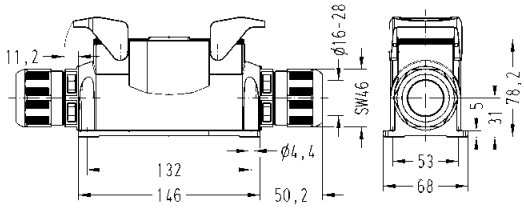
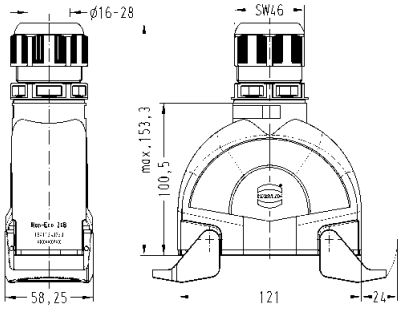
Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	**19 41 216 0301**			
Housings, surface mounting, with integrated cable gland side entry 	**19 41 316 0233**	M40		
Housings, surface mounting, with integrated cable gland side entries 	**19 41 316 0273**	2x M40		
Hoods, cable to cable, with integrated cable gland top entry 	**19 41 316 0723**	M40		

Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hood with integrated cable gland side entry 	**19 41 124 0523**	M40		
Hood with integrated cable gland top entry 	**19 41 124 0423**	M40		
Protection covers for hoods 	**19 41 024 5406**			

Stock items in bold type

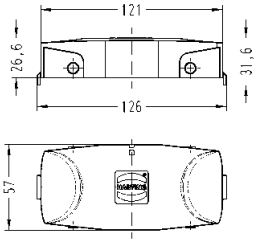
Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	**19 41 024 0301**			
Housings, surface mounting, with integrated cable gland side entry 	**19 41 124 0233**	M40		
Housings, surface mounting, with integrated cable gland side entries 	**19 41 124 0273**	2x M40		
Hoods, cable to cable, with integrated cable gland top entry 	**19 41 124 0723**	M40		

Stock items in bold type

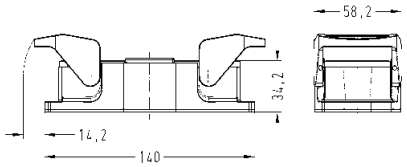
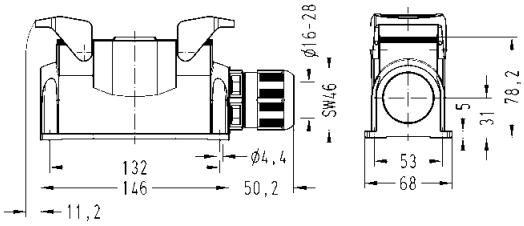
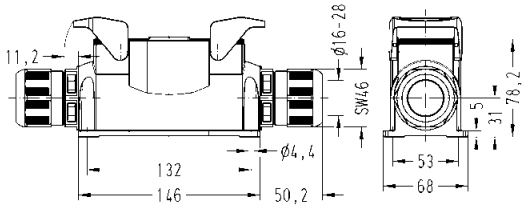
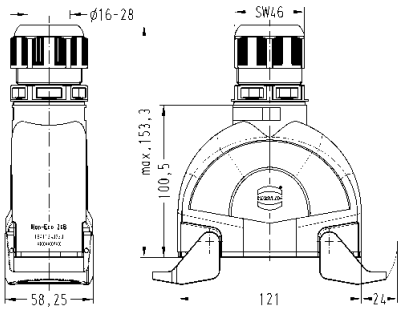
Plastic hoods/housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Protection covers for housings	**19 41 024 5405**			



Stock items in bold type

Plastic hoods/housings for outdoor applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	**19 41 224 0301**			
Housings, surface mounting, with integrated cable gland side entry 	**19 41 324 0233**	M40		
Housings, surface mounting, with integrated cable gland side entries 	**19 41 324 0273**	2x M40		
Hoods, cable to cable, with integrated cable gland top entry 	**19 41 324 0723**	M40		

Stock items in bold type

Han-Modular® Shielded module

Features

- Data bus shielding separated from housing
- Ideal for the transmission of very sensitive signals (e.g. bus signals)

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984

Han® Module adapter

Number of contacts	20 + shield
Insulation resistance	≥ 10^{10} Ω
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Shielded insert

Electrical data acc. to DIN EN 61 984	**4 A 32 V 0.8 kV 3**
Rated current	4 A
Rated voltage	32 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Material	
- Insulator	Liquid Crystaline Polymer
- Outer conductor	Zinc alloy
Contact resistance	≤ 4 mΩ
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Outer surface finish	Nickel
Cable diameter	5 ... 12 mm

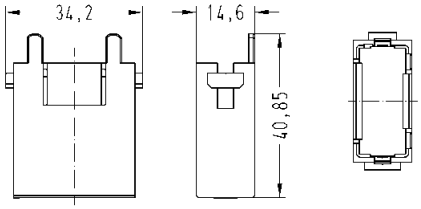
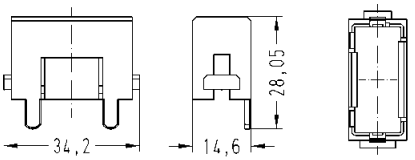
Han® D-Sub crimp contacts

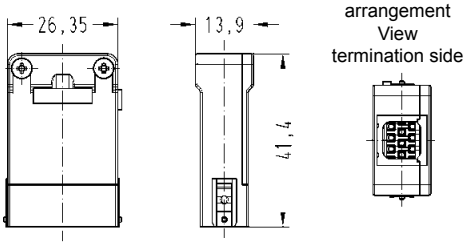
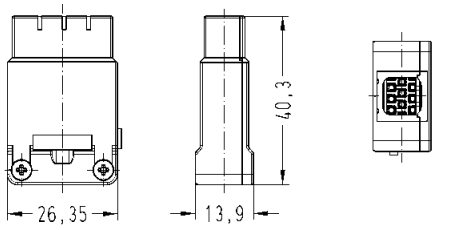
Crimp terminal	
- mm²	0.08 ... 0.52 mm²
- AWG	28 ... 20
Turned contacts	Performance level 1

Han-Modular® Shielded module 32 V 4 A

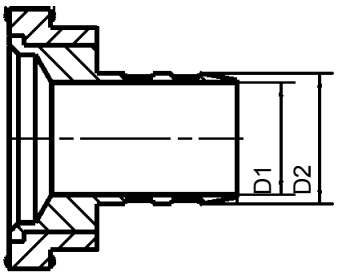
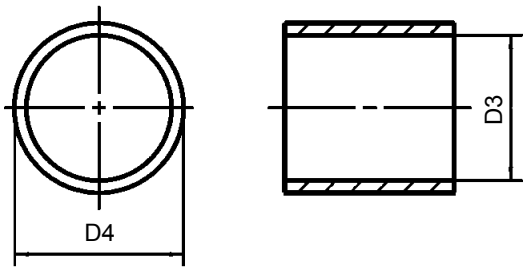
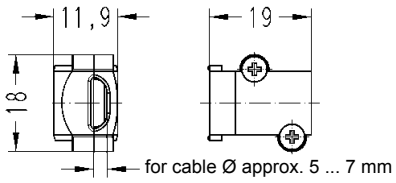
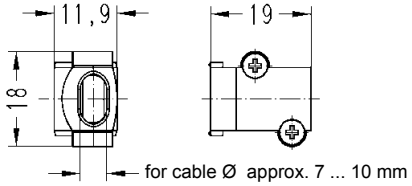
Number of contacts

20

Identification	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Han® module adapter 	09 14 001 3011	09 14 001 3111	M  F 	

Identification	Wire gauge mm²	Part-Number Male contacts (M)	Part-Number Female contacts (F)	Drawings	Dimensions in mm
Shielded insert 20 + shield crimp contacts order separately		09 14 020 3013	09 14 020 3113	M  F 	Contact arrangement View termination side
Han® D-Sub crimp contacts gold plated 	0.08-0.21 0.13-0.33 0.33-0.52	09 67 000 7576 09 67 000 5576 09 67 000 8576	09 67 000 7476 09 67 000 5476 09 67 000 8476		

Wire gauge	ø	Stripping length of stranded wire
0.08 - 0.21 mm²	AWG 28-24	4 mm
0.13 - 0.33 mm²	AWG 26-22	4 mm
0.33 - 0.52 mm²	AWG 22-20	4 mm

Identification		Part-Number	Drawings	Dimensions in mm
Crimp flange				
D1	D2			
3.0	4.0	61 03 000 0062		
3.5	4.5	61 03 000 0063		
4.0	5.0	61 03 000 0064		
4.5	5.5	61 03 000 0065		
5.0	6.0	61 03 000 0066		
5.5	6.5	61 03 000 0166		
6.0	7.0	61 03 000 0067		
6.5	7.5	61 03 000 0068		
7.0	8.0	61 03 000 0069		
7.5	8.5	61 03 000 0070		
8.0	9.0	61 03 000 0071		
8.5	9.5	61 03 000 0165		
9.0	10.0	61 03 000 0072		
Crimp ferrule				
D3	D4			
5.0	6.0	61 03 000 0045		
5.5	6.5	61 03 000 0046		
6.0	7.0	61 03 000 0047		
6.5	7.5	61 03 000 0048		
7.0	8.0	61 03 000 0049		
7.5	8.5	61 03 000 0050		
8.0	9.0	61 03 000 0051		
8.5	9.5	61 03 000 0052		
9.0	10.0	61 03 000 0053		
9.5	10.5	61 03 000 0054		
10.0	11.0	61 03 000 0055		
10.5	11.5	61 03 000 0056		
11.0	12.0	61 03 000 0057		
11.5	12.5	61 03 000 0058		
12.0	13.0	61 03 000 0142		
12.5	13.5	61 03 000 0059		
13.0	14.0	61 03 000 0127		
Cable clamp				
cable diameter approx. 5 ... 7 mm		61 03 000 0141		
cable diameter approx. 7 ... 10 mm		61 03 000 0044		
cable diameter approx. 10 ... 12 mm		61 03 000 0143		

Notes

Han® MegaBit Module

Features

- Shielding bus separate from housing potential
- Suitable for Ethernet Cat. 5e
- Suitable for Han B, Han M, Han EMC and Han HPR hoods/housings, high construction

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984

Han® module adapter

Number of contacts	2 x 4
Insulation resistance	≥ 10^{10} Ω
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Han® MegaBit insert

Number of contacts	2 x 4 + shielding
Electrical data acc. to DIN EN 61 984	**10 A 50 V 0.8 kV 3**
Rated current	10 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Material	
- insulator	Polycarbonate
- outer conductor	Zinc alloy
Contact resistance	≤ 4 mΩ
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Outer surface finish	Nickel
Cable diameter	5 ... 12 mm

Han D® crimp contacts

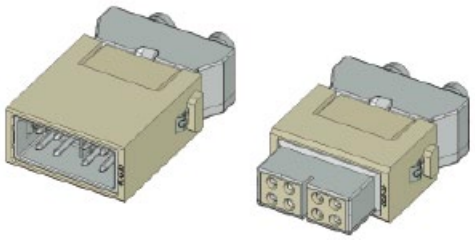
Material	Copper alloy
Surface	
- hard gold plated	3 µm Au over 3 µm Ni
Contact resistance	≤ 3 mΩ
Crimp terminal	
- mm²	0.14 ... 2.5 mm²
- AWG	26 ... 14

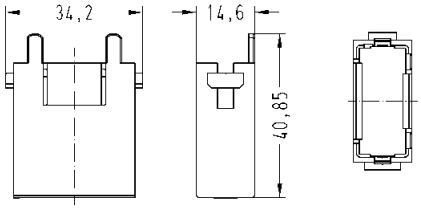
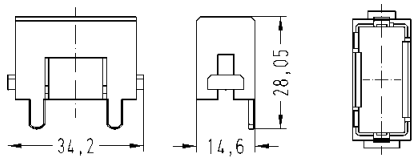
Han® MegaBit Module

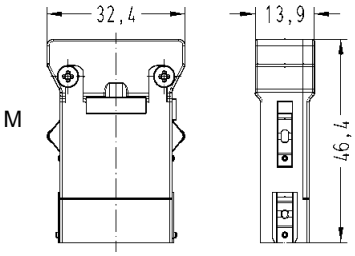
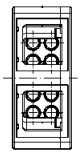
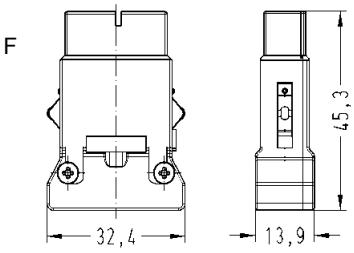
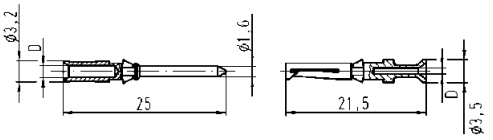
50 V 10 A

Number of contacts

2 x 4



Identification	Part-Number Male insert (M)	Female insert (F)	Drawings	Dimensions in mm
Han® module adapter 	09 14 001 3011	09 14 001 3111	M  F 	

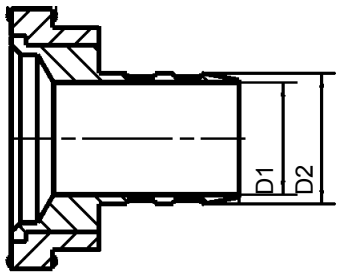
Identification	Wire gauge mm²	Part-Number Male contacts (M)	Female contacts (F)	Drawings	Dimensions in mm
Han® MegaBit insert 2 x 4 contacts crimp contacts order separately		09 14 008 3016	09 14 008 3116	M  Contact arrangement View termination side 	
2 x 4 contacts with additi-onal shield connection to the hinged frame crimp contacts order separately		09 14 008 3017	09 14 008 3117	F 	
Han D® crimp contacts gold plated	0.14-0.37	09 15 000 6124	09 15 000 6224		
	0.5	09 15 000 6123	09 15 000 6223		
	0.75	09 15 000 6125	09 15 000 6225		
	1.0	09 15 000 6122	09 15 000 6222		
	1.5	09 15 000 6121	09 15 000 6221		
	2.5	09 15 000 6126	09 15 000 6226		

Wire gauge		ø	Stripping length of stranded wire
0.14 - 0.37 mm²	AWG 26-22	0.9	8 mm
0.5 mm²	AWG 20	1.1	8 mm
0.75 mm²	AWG 18	1.3	8 mm
1.0 mm²	AWG 18	1.45	8 mm
1.5 mm²	AWG 16	1.75	8 mm
2.5 mm²	AWG 14	2.25	6 mm

Identification	Part-Number	Drawings	Dimensions in mm

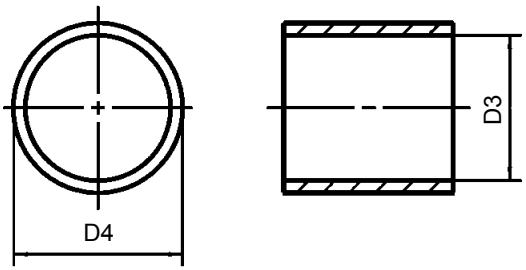
Crimp flange

D1	D2	Part-Number
3.0	4.0	61 03 000 0062
3.5	4.5	61 03 000 0063
4.0	5.0	61 03 000 0064
4.5	5.5	61 03 000 0065
5.0	6.0	61 03 000 0066
5.5	6.5	61 03 000 0166
6.0	7.0	61 03 000 0067
6.5	7.5	61 03 000 0068
7.0	8.0	61 03 000 0069
7.5	8.5	61 03 000 0070
8.0	9.0	61 03 000 0071
8.5	9.5	61 03 000 0165
9.0	10.0	61 03 000 0072



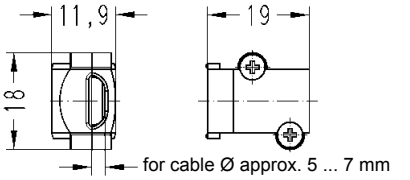
Crimp ferrule

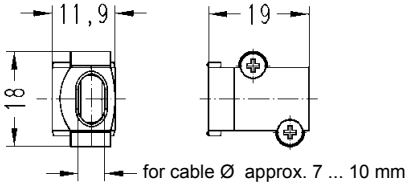
D3	D4	Part-Number
5.0	6.0	61 03 000 0045
5.5	6.5	61 03 000 0046
6.0	7.0	61 03 000 0047
6.5	7.5	61 03 000 0048
7.0	8.0	61 03 000 0049
7.5	8.5	61 03 000 0050
8.0	9.0	61 03 000 0051
8.5	9.5	61 03 000 0052
9.0	10.0	61 03 000 0053
9.5	10.5	61 03 000 0054
10.0	11.0	61 03 000 0055
10.5	11.5	61 03 000 0056
11.0	12.0	61 03 000 0057
11.5	12.5	61 03 000 0058
12.0	13.0	61 03 000 0142
12.5	13.5	61 03 000 0059
13.0	14.0	61 03 000 0127



Cable clamp

	Part-Number
cable diameter approx. 5 ... 7 mm	61 03 000 0141
cable diameter approx. 7 ... 10 mm	61 03 000 0044





Notes

Features

- One contact (70 A) for power circuits
- Four contacts (16 A) for signal circuits
- Combination of power and signal contacts in one module

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 60 61984

Inserts

Number of contacts	1 / 4
Electrical data accd. to DIN EN 61 984	
Power contacts	**70 A 1000 V 8 kV 3**
Rated current	70 A
Rated voltage	1000 V
Rated impulse voltage	8 kV
Pollution degree	3
Signal contacts	**16 A 400 V 6 kV 3**
Rated current	16 A
Rated voltage	400 V
Rated impulse voltage	6 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ω
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Power Contacts

Material	Copper alloy
Surface	
- hard-silver plated	3 µm Ag
Contact resistance	≤ 0.5 mΩ
Axial screw terminal	
- geometric wire gauge	6 ... 22 mm²
- AWG	8 ... 4
- Hexagonal drive	SW 2.5

Tightening torque

mm²	6	10	16	22
Nm	2	3	4	4

Stripping length

mm²	6	10	16	22
mm	11^{+1}	11^{+1}	11^{+1}	12.5^{+1}

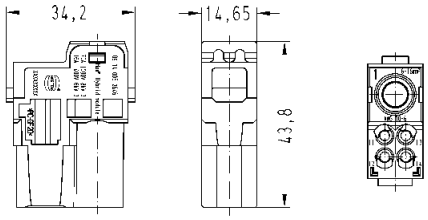
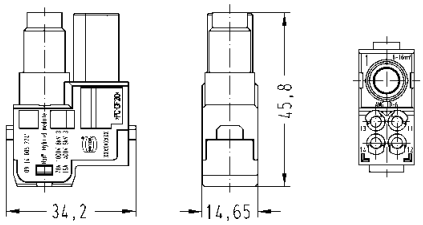
Signal Contacts

Material	Copper alloy
Surface	
- hard-silver plated	3 µm Ag
- hard-gold plated	2 µm Ag over 3 µm Ni
Contact resistance	≤ 1 mΩ
Crimp terminal	
- mm²	0.14 ... 4 mm²
- AWG	26 ... 12

Han-Modular® 70 A Hybrid Module

Number of contacts

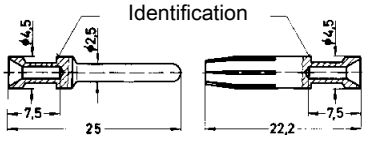
1 x 70 A
4 x 16 A

Identification	Part-Number Male insert (M)	Female insert (F)	Drawings	Dimensions in mm
Han® 70 A Hybrid Module				
axial screw terminal				
6 ... 16 mm²	09 14 005 2646	09 14 005 2741		M
14 ... 22 mm²	09 14 005 2647	09 14 005 2742		F

Identification	Part-Number	Depiction
Hex Key SW 2.5		
for axial screw terminal		
Bit ¼ "	09 99 000 0375	

Identification	Wire gauge (mm²)	Male insert (M)	Female insert (F)	Drawings	Dimensions in mm
Signal contacts					
crimp terminal	0.14-0.37	09 33 000 6127	09 33 000 6227		
silver plated	0.5	**09 33 000 6121**	**09 33 000 6020**		
	0.75	**09 33 000 6114**	**09 33 000 6214**		
	1	**09 33 000 6105**	**09 33 000 6205**		
	1.5	**09 33 000 6104**	**09 33 000 6204**		
	2.5	**09 33 000 6102**	**09 33 000 6202**		
	3	09 33 000 6106	09 33 000 6206		
	4	**09 33 000 6107**	**09 33 000 6207**		
gold plated	0.14-0.37	09 33 000 6117	09 33 000 6117		
	0,5	**09 33 000 6122**	**09 33 000 6222**		
	0.75	**09 33 000 6115**	**09 33 000 6215**		
	1	**09 33 000 6118**	**09 33 000 6218**		
	1.5	**09 33 000 6116**	**09 33 000 6216**		
	2.5	**09 33 000 6123**	**09 33 000 6223**		
	4	09 33 000 6119	09 33 000 6221		

Operating contact Identification



Identification	Wire gauge		Stripping length
no groove	0.14 ... 0.37 mm²	AWG 26-22	7.5 mm
no groove	0.5 mm²	AWG 20	7.5 mm
1 grooves*	0.75 mm²	AWG 18	7.5 mm
1 grooves	1 mm²	AWG 18	7.5 mm
2 grooves	1.5 mm²	AWG 16	7.5 mm
3 grooves	2.5 mm²	AWG 14	7.5 mm
wide groove	3 mm²	AWG 12	7.5 mm
no groove	4 mm²	AWG 12	7.5 mm

*on the back crimp collar

Crimp contacts 0.14 ... 0.37 mm² only used with BUCHANAN crimping tool 09 99 000 0001

Han® E Quick Lock module

Han-Quick Lock®

Features

- Innovative Han-Quick Lock® termination technology
- Field assembly without special tools
- Compatible to Han® E module with crimp terminal
- Reduced wiring times

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984

Inserts

Number of contacts	6
Electrical data	
acc. to EN 61 984	**16 A 500 V 6 kV 3**
Rated current	16 A
Rated voltage	500 V
Rated impulse voltage	6 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ω
Material	polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	
- mating cycles	≥ 500

Contacts

Material	copper alloy
Surface	
- hard-silver plated	3 µm Ag
- hart gold plated	2 µm Au over 3 µm Ag Ni
Contact resistance	≤ 1 mΩ
Quick Lock termination	
- mm²	0.5 ... 2.5 mm²
- AWG	20 ... 14

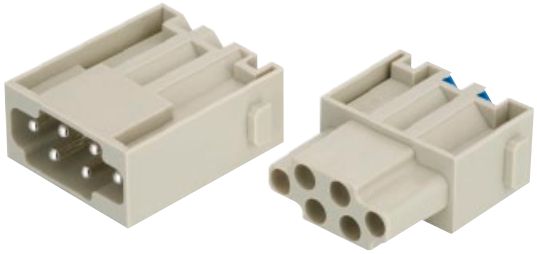
Han® E Quick Lock module

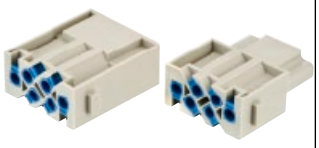
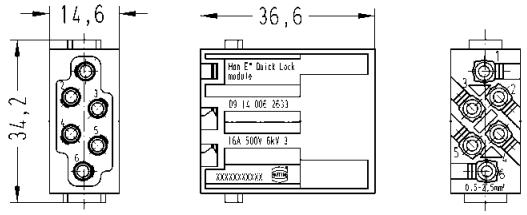
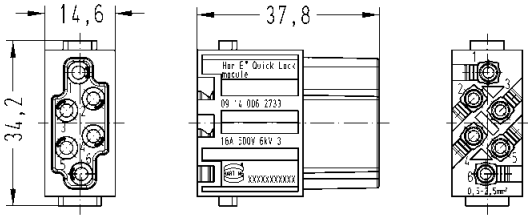
Han-Quick Lock®

500 V 16 A

Number of contacts

6

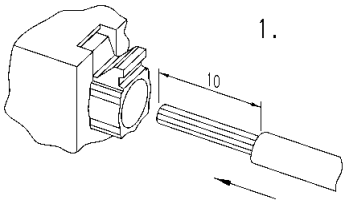


Identification	Part number Male insert (M)	Part number Female insert (F)	Drawing	Dimensions in mm
Quick Lock termination 	09 14 006 26 33	09 14 006 27 33	M  F 	

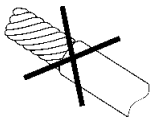
Contact arrangement
view from
termination side

Assembly manual

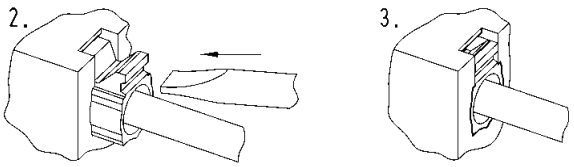
Remove cable jacket and strip the fine stranded wires



Do not twist the fine stranded wires!

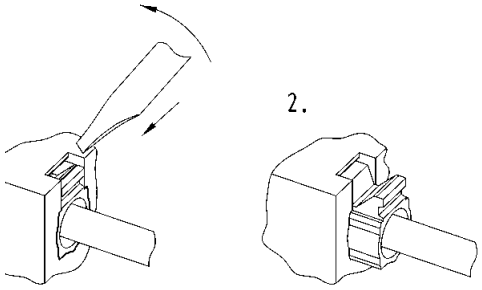


Push fine stranded wires into the Han-Quick Lock® contact and push the blue slide with a screw driver[1] until it comes to a stop



Removal manual

Please insert the screw driver[1] at an angle of 45° into the opening and lever the black slide out



[1] Screw driver: 0.4 x 2.5 mm

Han® HV Single module

Features

- Suitable for Han® E crimp contacts
- 2 contacts up to 2500 V
- Insulator out of a voltage resistant teflon material
- Combination with all other modules (pneumatic, signal etc.) is possible

Technical characteristics

Specifications	DIN EN 61 984 DIN VDE 0115 DIN EN 60 664-1

Inserts

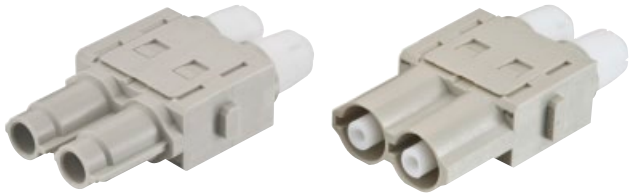
Number of contacts	2
Electrical data acc. to EN 61 984	**16 A 2500 V 15 kV 3**
Rated current	16 A
Rated voltage	2500 V
Rated impulse voltage	15 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ω
Material	Polycarbonate/Teflon (PTFE)
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	
- mating cycles	≥ 500

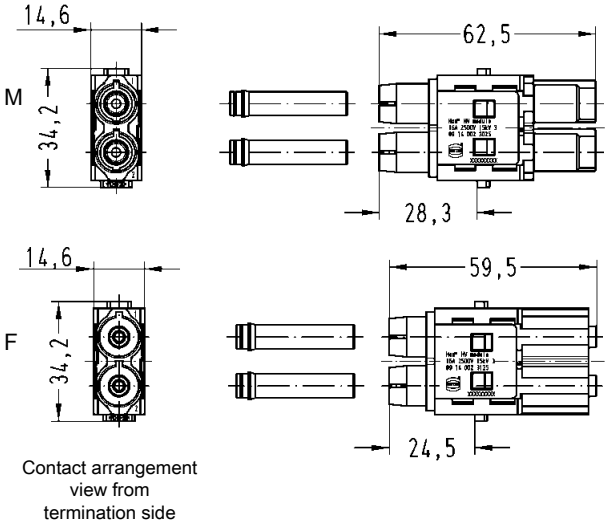
Contacts

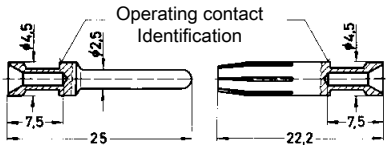
Material	Copper alloy
Surface	
- hard-silver plated	3 µm Ag
- hard gold platet	2 µm Au over 3 µm Ag Ni
Contact resistance	≤ 1 mΩ
Crimp terminal	
- mm²	0.5 ... 4 mm²
- AWG	20 ... 12

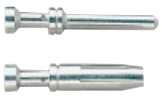
Number of contacts

2



Identification	Part number Male insert (M)	Part number Female insert (F)	Drawing	Dimensions in mm
Crimp terminal Order crimp contacts separately	09 14 002 3025	09 14 002 3125	 Contact arrangement view from termination side	

Identification	Wire gauge (mm²)	Part number Male contact	Part number Female contact	Drawing	Dimensions in mm
Crimp contacts Han E® Power contacts silver plated	0.14-0.37	09 33 000 6127	09 33 000 6227		
	0.5	09 33 000 6121	09 33 000 6220		
	0.75	09 33 000 6114	09 33 000 6214		
	1.0	09 33 000 6105	09 33 000 6205		
	1.5	09 33 000 6104	09 33 000 6204		
	2.5	09 33 000 6102	09 33 000 6202		
	3.0	09 33 000 6106	09 33 000 6206		
	4.0	09 33 000 6107	09 33 000 6207		



Wire gauge		Identification	Stripping length
4.0-0.37 mm²	AWG 26-22	no groove	7.5 mm
0.5 mm²	AWG 20	no groove	7.5 mm
0.75 mm²	AWG 18	1 groove*	7.5 mm
1.0 mm²	AWG 18	1 groove	7.5 mm
1.5 mm²	AWG 16	2 grooves	7.5 mm
2.5 mm²	AWG 14	3 grooves	7.5 mm
3.0 mm²	AWG 12	wide groove	7.5 mm
4.0 mm²	AWG 12	no groove	7.5 mm

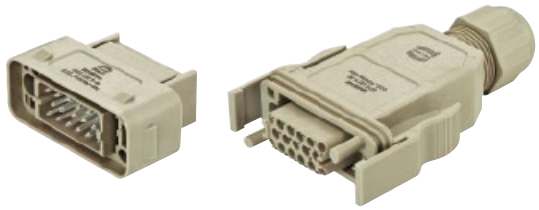
* on the back crimp collar

Features

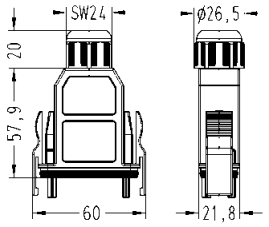
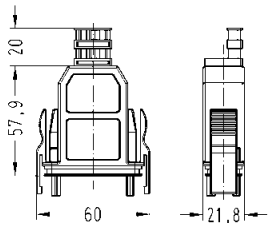
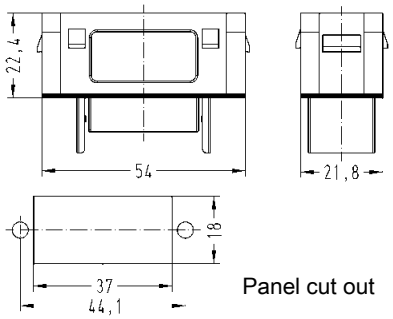
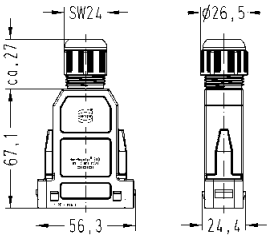
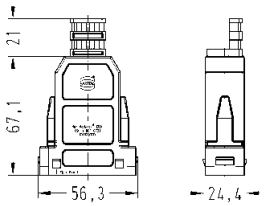
- Suitable for all Han-Modular® single modules
- The variant with PE connection uses pin 1 of the module as PE
- Slim, space saving design
- Low cost plastic hoods and housings

Technical characteristics

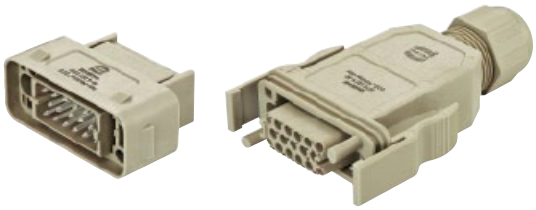
Specifications	DIN EN 60 664-1 DIN EN 61 984
Hoods/Housings	
Material	
- hoods/Housings	polycarbonate
- seal	NBR
- cable seal	Polyamide
Limiting temperatures	-40 °C ... +85 °C
Flammability acc. to UL 94	V 0
Degree of protection acc. to DIN EN 60 529 for coupled connector	IP 20 / IP 65
Mechanical working life	
- mating cycles	≥ 500



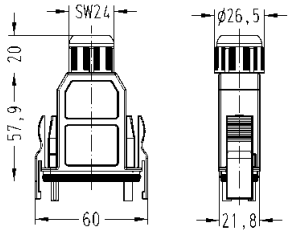
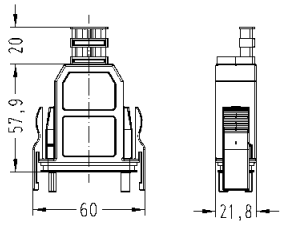
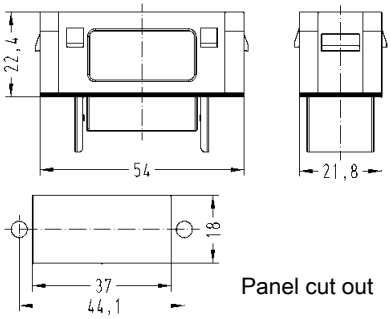
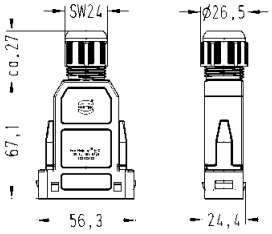
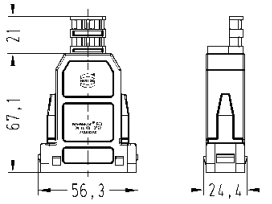
Plastic hoods/housings with PE marking

Identification	Part number	Drawing	Dimensions in mm
Hoods with PE marking (pin 1 = PE) IP 65 top entry 	**09 14 001 0421**		
Hoods with PE marking (pin 1 = PE) IP 20 top entry 	**09 14 001 0423**		
Hoods with PE marking (pin 1 = PE) IP 20 / IP 65 top entry 	**09 14 001 0321**	 Panel cut out	
Cable to cable hoods with PE marking (Pin 1 = PE) top entry IP 20 	**09 14 001 0721**		
IP 65 	**09 14 001 0723**		
Coding pin 	**09 14 000 9929**		Range of delivery: 8 pieces per frame

Stock items in bold type



Plastic hoods/housings without PE

Identification	Part number	Drawing	Dimensions in mm
Hoods without PE IP 65 top entry 	**09 14 001 0420**		
Hoods without PE IP 20 top entry 	**09 14 001 0422**		
Hoods without PE IP 20 / IP 65 top entry 	**09 14 001 0320**		Panel cut out
Cable to cable hoods without PE top entry IP 20 	**09 14 001 0720**		
IP 65 	**09 14 001 0722**		
Coding pin 	**09 14 000 9929**		Range of delivery: 8 pieces per frame

Stock items in bold type

Notes

PCB Adapter for Han® DDD module

Features

- Modular construction
- Robust design
- Suitable for standard Han® and EMC hoods and housings
- Low wiring costs

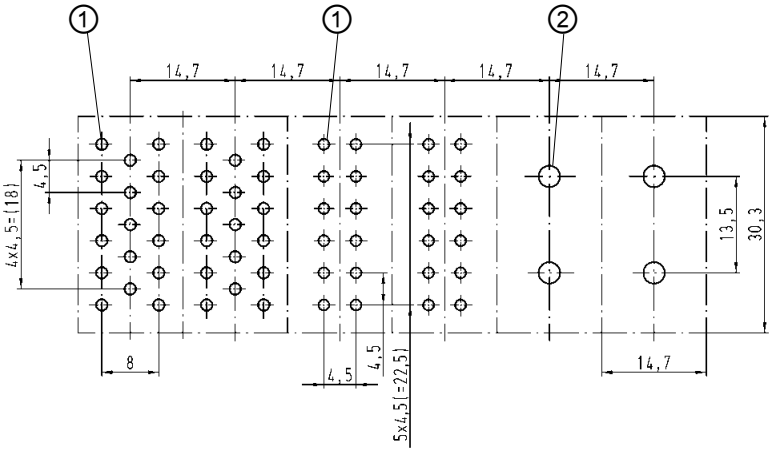
Technical characteristics

Han® DDD module with PCB adapter

Electrical data	
acc. to DIN EN 61 984	**7.5 A 160 V 2.5 kV 3**
Rated current	7.5 A
Rated voltage	160 V
Rated impulse voltage	2.5 kV
Pollution degree	3
Wire gauge	0.14 ... 2.5 mm²

Layout of PCB

Dimensions in mm

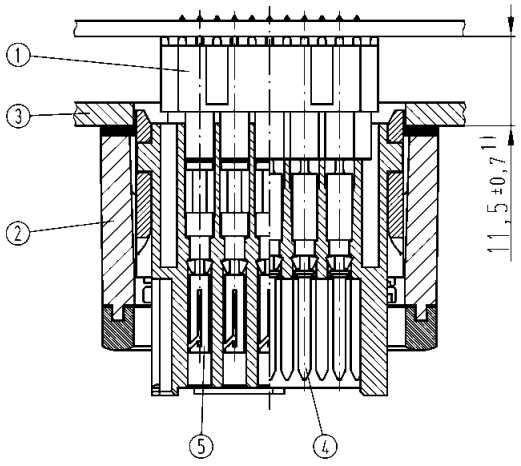


① Recommended hole diameter: 0.8 mm
② Recommended hole diameter: 3.2 mm

Han® DDD module Han® DD module Han® 70 A module

Assembly situation

Dimensions in mm



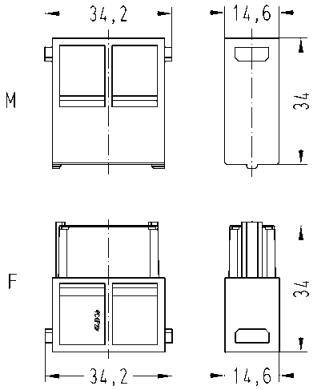
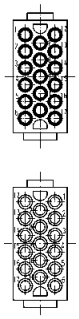
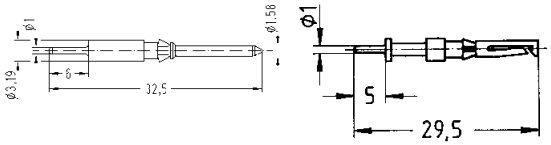
① Han DDD® PCB adapter 5 pins
② Han® B bulkhead mounted housing
③ Switch board panel
④ Han D® double male contact, 09 15 000 6197
⑤ Han D® double female contact, 09 15 000 6291

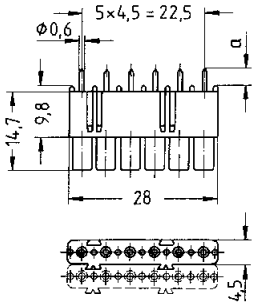
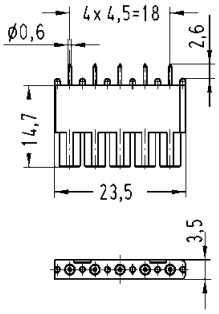
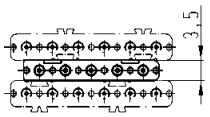
1) for Han® B EMV hood and housing spacing of 12.5 ±0.7 mm is necessary as no flange seal is used.

For further information and Han-Modular® frames please refer to chapter 06 (Han-Modular®) in the main catalogue Industrial Connectors Han®

PCB Adapter for Han® DDD module

5 pin PCB adapter

Identification	Part number Male insert (M)	Part number Female insert (F)	Drawing	Dimensions in mm
Han® DDD module PCB termination/ crimp termination Order crimp contacts separately 	09 14 017 3001	09 14 017 3101		 Contact arrangement view from termination side
Han D® double contacts to connect PCB adapter only for Han® DDD male module 	09 15 000 6197	09 15 000 6291		

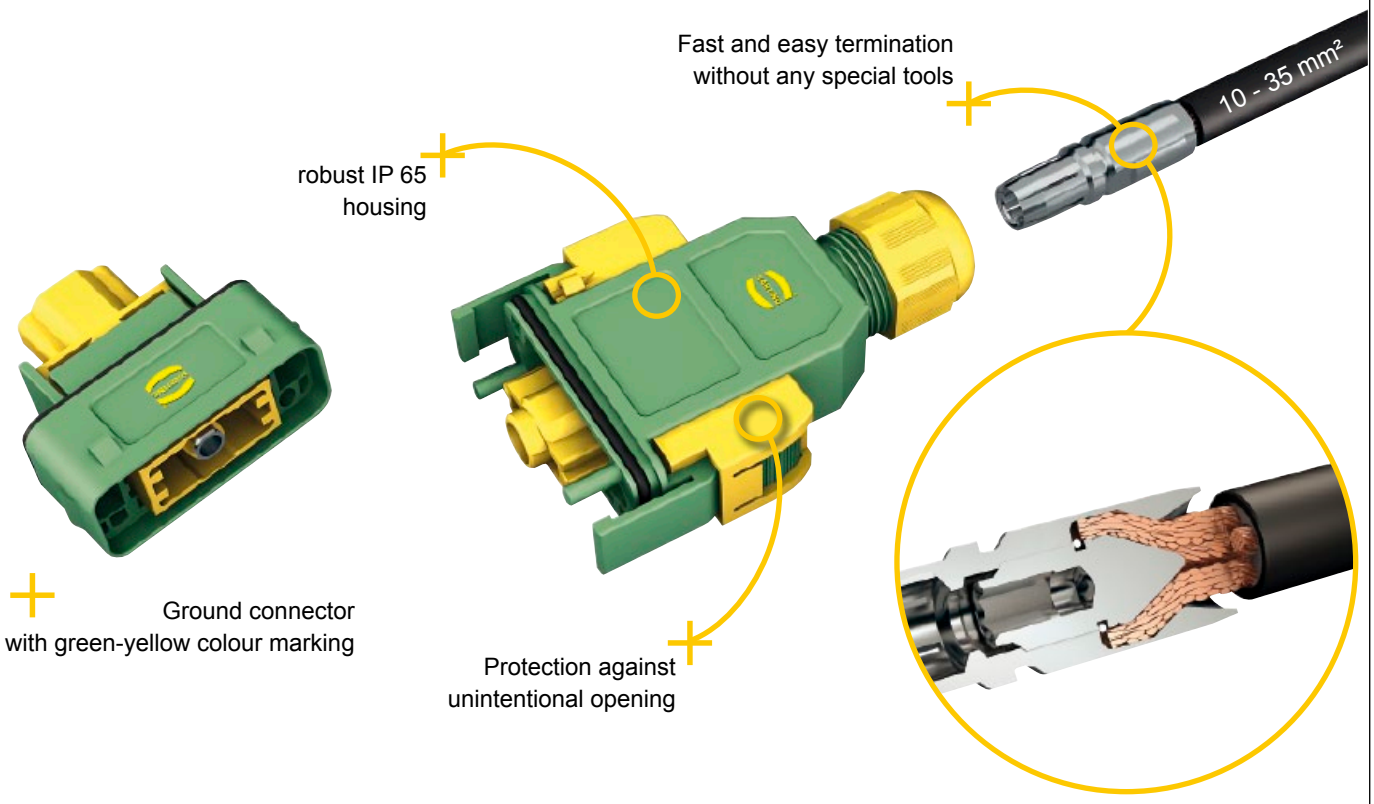
Identification	PCB thickness	Part number	Drawing	Dimensions in mm
PCB adapter 6 pins* 	1.6 mm	09 16 000 9905		
PCB adapter 5 pins* 	1.6 mm	09 16 000 9915	 Contact arrangement for a fully equipped Han® DDD Module 	

* For a 17 pin PCB termination with the Han® DDD module two 6 pin and one 5 pin PCB adapters are necessary.

Han® GND - Mateable Potential Equalization

The new Han® GND series now enables pluggable grounding systems
Han® GND (Han® Ground) is the innovative HARTING solution for potential equalization. The new connector series makes it possible to execute grounding systems in a pluggable design for the first time.

The use of connectors has been well-established in the electrical cabling of machines and systems for many years. The advantage is quick and error-free commissioning. Potential equalization lines are still being permanently connected, which is relatively time-consuming and can be subject to errors. HARTING's remedy: the Han® GND. The single-pole connector in the robust IP 65 plastic housing is designed for stranded wires from 10 - 35 mm² and is optionally available in crimp or axial screw termination. The latter has the advantage that the lines can be connected without a special tool. A simple screwdriver is all it takes to achieve a quick and easy reliable connection. Extra connector mating security can be provided by the use of additional locking elements that prevent unintentional opening.



Features

- New: First connector for potential equalization
- Slim, space saving design
- Low cost plastic hoods and housings
- Colours: green and yellow
- Separate axial screw contacts can be terminated without any special tools directly to the wire.

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984

Hoods/Housings

Material	
- hoods/housings	polycarbonate
- seal	NBR
- cable seal	polyamide
Limiting temperatures	-40 °C ... +85 °C
Flammability acc. to UL 94	V 0
Degree of protection according to DIN EN 60 529 for coupled connectors	IP 65
Mechanical working life	≥ 500 mating cycles
Cable diameter	7.5 - 14 mm

Modules

Number of contacts	1
Material	polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Crimp Contacts

Material	copper alloy
Surface	
- hard-silver plated	3 µm Ag
Contact resistance	≤ 0.3 mΩ
Crimp terminal	
- wire gauge[1)]	10 ... 35 mm²

Axial Screw Contacts

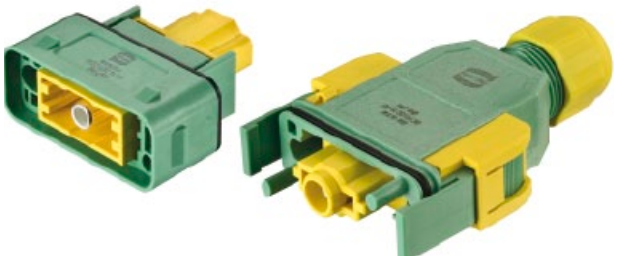
Material	copper alloy
Surface	
- hard-silver plated	3 µm Ag
Contact resistance	≤ 0.3 mΩ
Screw terminal	
- wire gauge[1)]	10 ... 35 mm²
- AWG	6 ... 2
- hexagonal driver	SW 4
- tightening torque	

mm²	10	16	25	35
Nm	6	6	7	8

1) geometric wire gauge

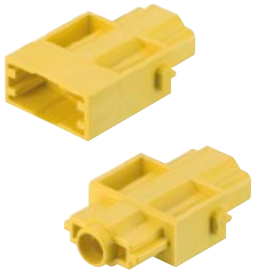
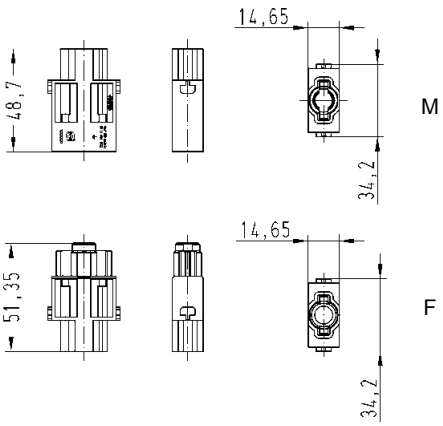
Number of contacts

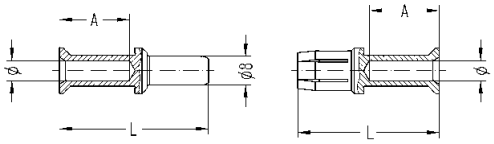
1



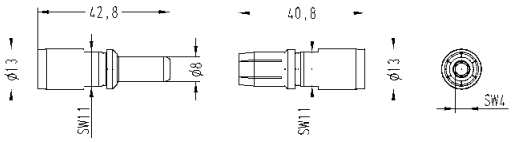
Mateable Potential Equalization

Identification	Part-Number	Drawings	Dimensions in mm
Hood top entry	09 14 001 0430		
Unlocking Protection	09 14 000 9938		
Housing	09 14 001 0330		
Hoods, cable to cable	09 14 001 0730		
Gender changer / coupler male / male	09 14 001 9901		

Identification	Part-Number Male module (M)	Female module (F)	Drawings	Dimensions in mm
Modules order contacts separately 	09 14 001 3032	09 14 001 3132		

Identification	Wire gauge (mm²)	Part number Male contact	Female contact	Drawing	Dimensions in mm
Crimp contacts*					
	10	09 11 000 6114	09 11 000 6214		
	16	09 11 000 6116	09 11 000 6216		
	25	09 11 000 6125	09 11 000 6225		
	35	09 11 000 6135	09 11 000 6235		

Wire gauge	Ø	Stripping length (A)
10 mm²	4.3	19 mm
16 mm²	5.5	19 mm
25 mm²	7.0	19 mm
35 mm²	8.2	16 mm
for stranded wire acc. to IEC 60 228 Class 5		

Axial screw contacts					
	10-25	09 11 000 6112	09 11 000 6212		
	16-35	09 11 000 6113	09 11 000 6213	Stripping length 13 mm	

Identification	Part number	Drawing	Dimensions in mm
Hex key SW 4 for axial setscrew			
with grip 	09 99 000 0363		
Bit 3/8“ 	09 99 000 0370		

* Crimp zone acc. to DIN EN 46 235

For further information see chapter 99 (Tools) in the main catalogue „Industrial Connectors Han®“

Han-Power® S with functional LED Display and on/off Switch

Features

- 4 IDC's + PE for 10 mm² wires
- Energy supply can be switched off
- Lockable switch in null position
- 3 fuses for energy supply 5.3 x 20 mm.
  Not included with product.

Advantages

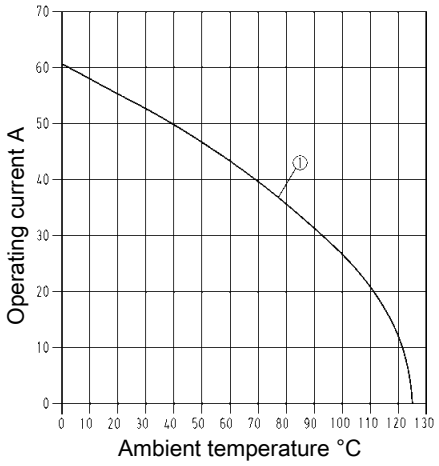
- No interruption of energy supply
- Space-saving and compact design
- Functional LED display

Assembly details

The Han-Power® S connector is suitable for the assembly of serial power bus. Having assembled the energy supply Han-Power® S can be inserted at any place along the power cable. The cable outer sheath has to be removed, the conductor is placed without interruption in the IDC.
Han-Power® S is suitable for cables with single strands manufactured acc. to DIN VDE 0281/ DIN EN 60 228 with wire gauges of 10.0 mm². For the distribution of the device Han-Compact® cable to cable hoods are used.
This power supply can be used with Han-Compact® hood.

Current carrying capacity

The current carrying capacity of the connectors is limited by the thermal load capability of the contact element material including the connections and the insulating parts. The derating curve is therefore valid for currents which flow constantly (non-intermittent) through each contact element of the connector evenly, without exceeding the allowed maximum temperature.
Measuring and testing techniques according to DIN EN 60 512-5.

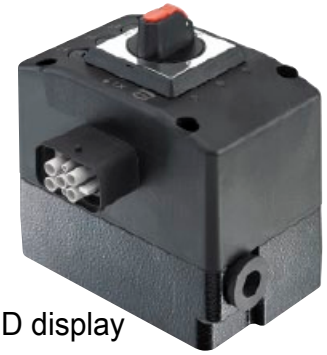


① Energy supply Wire gauge: 10 mm²

Technical characteristics

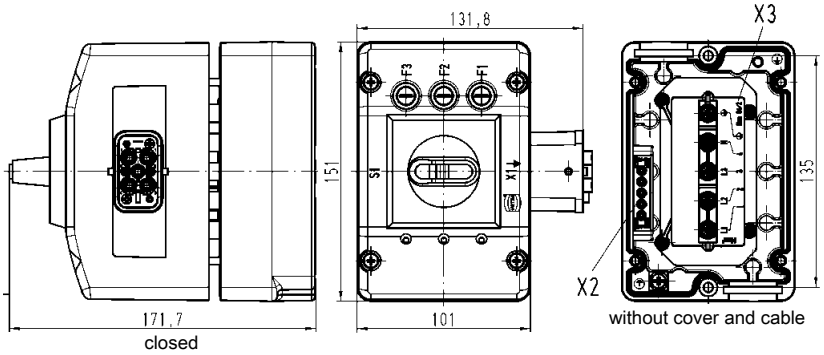
Specifications	DIN EN 61 984 DIN EN 60 664-1 IEC 61 439-2
Han-Power® S	
Number of contacts	
- Power contacts	4 + PE
Power side	
Electrical data acc. to EN 61 984	
Interface to connector	**10 A 230/400 V 4 kV 3**
Rated current	10 A
Rated voltage conductor - ground	230 V
Rated voltage conductor - conductor	400 V
Rated impulse voltage	4 kV
Rated short-circuit current	0.5 kA
Pollution degree	3
Frequency	50 Hz
Energy bus	**50 A 230/400 V 4 kV 3**
Max. operating temperature	-5°C … 60°C
Degree of protection acc. to DIN EN 60 529	IP 65
Mechanical working life	≥ 500 mating cycles
Security fixing	
nach IEC 60 127-1; nach UL 4248-1 / UL 512 nach CSA C22.2 no. 39	
Rated current$_{Ina}$	10 A
Rated voltage$_{Un}$	250 V
Technical data of switches	
Electrical data acc. to IEC/EN 60 947	**16 A 750 V 0.5 kA**
Rated current$_{Ina}$	16 A
Rated voltage$_{Un}$	750 V
Rated short-circuit current$_{Icc}$	0.5 kA
Mechanical working life	10 000 operations

Han-Power® S with functional LED Display and on/off Switch

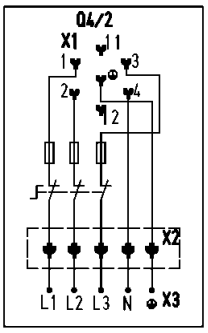


Han-Power® S with 1 x Han® Q 4/2, on/off switch, fuses and functional LED display

Identification	Part-Number	Drawings	Dimensions in mm
Han-Power® S with 1 x Han® Q 4/2 with on/off switch, fuses and functional LED display Fuses are not included with product	09 12 008 4650		



Wiring plan



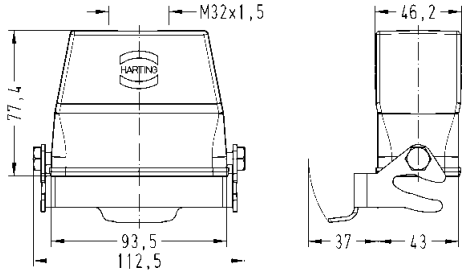
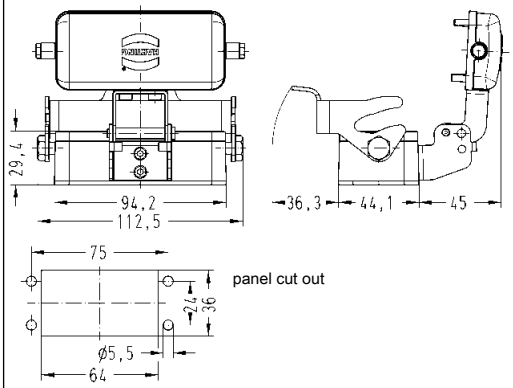
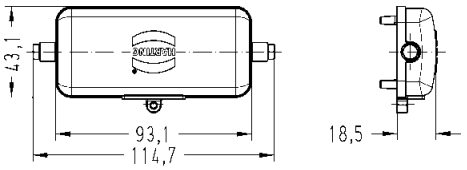
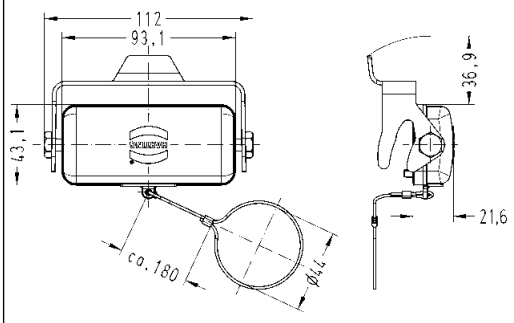
Han-INOX® 10 B

Features

- Hoods and housings as well as locking elements out of stainless steel
- Resistant against aggressive detergents
- Fields of application
  - Food and beverage industry
  - Water and sewage industry
  - Pharmaceutical industry
  - Chemical industry
  - Offshore and shipbuilding

Technical Characteristics

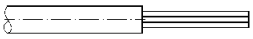
Material	Stainless steel
Seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Protection degree acc. to DIN EN 60 529 in locked position	IP 65
Locking lever	Stainless steel

Identification	Part-Number	Cable entry	Drawing	Dimensions in mm
Cable to cable housing M 32 	19 44 310 0757	M32		
Bulkhead mounted housing with ingetrated cover 	19 44 310 0303			
Cover for bulkhead mounted housing 	19 44 310 5421			
Cover for hood 	19 44 310 5422			

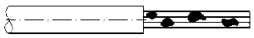
Features

- Crimp termination
- Plug compatible with Han® HC module 650 axial screw termination
- Single piece contact

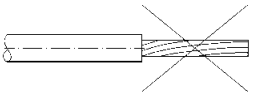
Assembly details



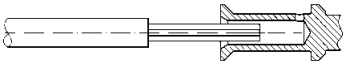
Cut the cable head square and strip the insulation



The copper strands must be cleaned from dirt and oxide film



Copper strands must not be twisted



Insert the cable strands completely into the crimp ferrule.
Insertion check via inspection hole

Special note

1) Using Han® 6 B HPR hoods and housings, it is compulsory to use the adapter, in order to guarantee an electrical strength of 4000 V. Otherwise an electrical strength of only 2000 V and 12 kV can be guaranteed.

   The crimp contact with wire gauge of 240 mm² must be used with a shrink tube.

2) Using Han® 24 B HPR enlarged hoods and housings the allowed insulation diameter must not be larger than 22 mm. Otherwise an electrical strength of only 2000 V and 12 kV can be guaranteed.

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984

Inserts

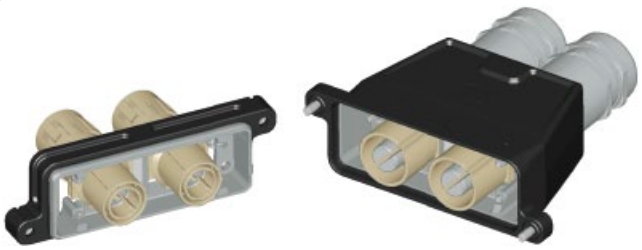
Electrical data acc. to DIN EN 61 984	**650 A 4000 V 18 kV 3**
Rated current	650 A
Rated voltage	4000 V
Rated impulse voltage	18 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ω
Material	Polyamide
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Contacts

Power contacts	
Material	Copper alloy
Surface	
- hard-silver plated	3 µm Ag
Contact resistance	≤ 0.3 mΩ
Crimp terminal	
- mm²	70 - 240 mm²
Max. insulation diameter	up tp 185 mm² 27 mm up to 240 mm² 32 mm
Pressing force requirement	130 kN

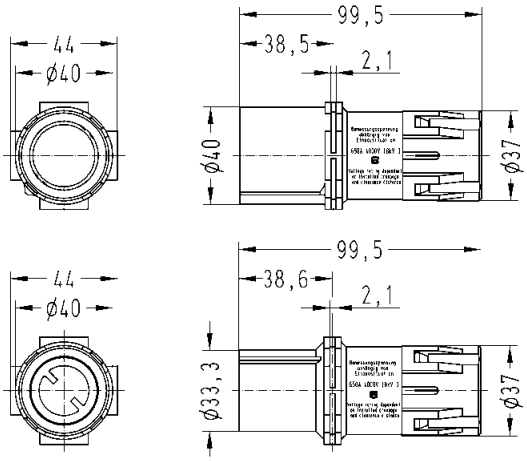
Frames

Tightening torque of fixing screws	0.5 Nm
Material	Stainless steel



Modular High Current Connector System

Identification	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Han® HC module 650 Crimp terminal	09 11 001 3011	09 11 001 3111	M F	



Identification	Wire gauge mm²	Part-Number Male contacts (M)	Part-Number Female contacts (F)	Drawings	Dimensions in mm
Crimp contacts* Silver plated	70	09 11 000 6161	09 11 000 6261	1 crimp Crimp area	
	95	09 11 000 6162	09 11 000 6262	1 crimp Crimp area	
	120	09 11 000 6163	09 11 000 6263	1 crimp Crimp area	
	150	09 11 000 6164	09 11 000 6264	1 crimp Crimp area	
	185	09 11 000 6165	09 11 000 6265	2 crimps Crimp area	
	240	09 11 000 6167	09 11 000 6267	2 crimps Crimp area	

Wire gauge	ø in mm	Stripping length
70 mm²	11.5	42 mm
95 mm²	13.5	42 mm
120 mm²	15.5	42 mm
150 mm²	17	42 mm
185 mm²	19	42 mm
240 mm²	21.5	46 mm

* for stranded wire acc. to IEC 60 228 class 5

* Crimp area acc. to DIN EN 46 235

Tools for Han® High Current Contacts

For crimp contacts: TC 70, TC 100, TC 200, TC 250, TC 350, TC 650

Identification	Part number	Drawing	Dimensions in mm

Crimp tool

Hydraulic handtool
Pressing force 130 kN

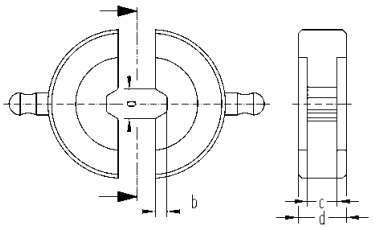
09 99 000 0385

- fast foreward action
- storage box
- weight 6.4 kg
- length 620 mm

Crimp dies

DIN 46 235
(supplied as apair)
use in combination
with die holder

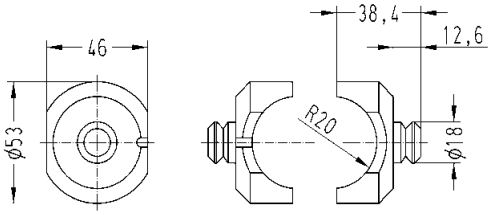
09 99 000 0398
09 99 000 0386
09 99 000 0387
09 99 000 0388
09 99 000 0391
09 99 000 0392
09 99 000 0393
09 99 000 0394
09 99 000 0399



Part-Number	Wire gauge	acc. to DIN 46 235	a	b	c	d
09 99 000 0398	10 mm²	B6 DIN	5.5	2.1	8	13
09 99 000 0386	16 mm²	B8 DIN	8	3.2	8	13
09 99 000 0387	25 mm²	B10 DIN	10	3.8	10	13
09 99 000 0388	35 mm²	B12 DIN	12	4.7	10	13
09 99 000 0391	50 mm²	B14 DIN	14	5.5	10	13
09 99 000 0392	70 mm²	B16 DIN	16	6	13	13
09 99 000 0393	95 mm²	B18 DIN	18	7.3	15	15
09 99 000 0394	120 mm²	B20 DIN	20	8	15	15
09 99 000 0399	150 mm²	B22 DIN	22	9.1	15	15

Die holder

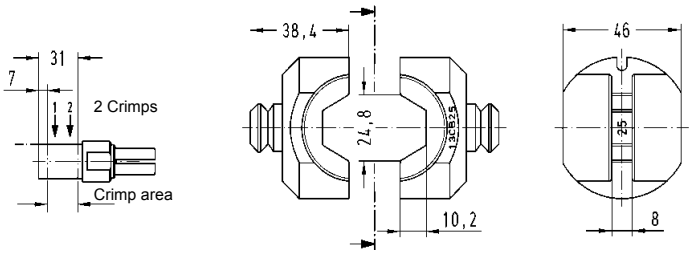
09 99 000 0389



Crimp die

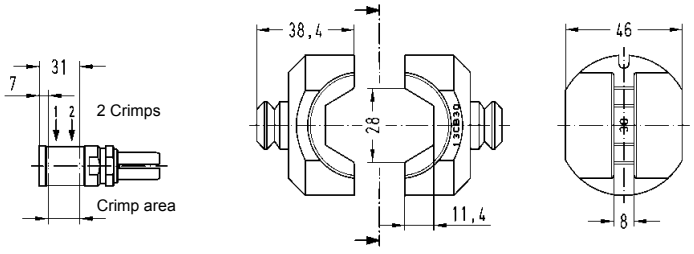
Wire gauge 185 mm²

09 99 000 0802



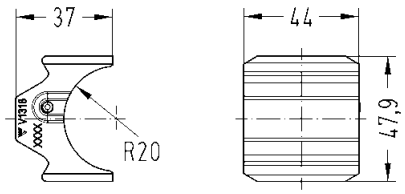
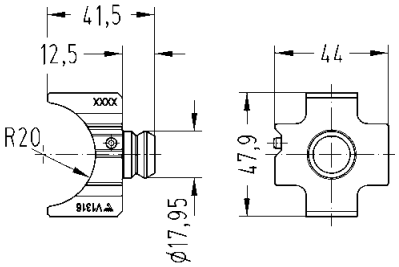
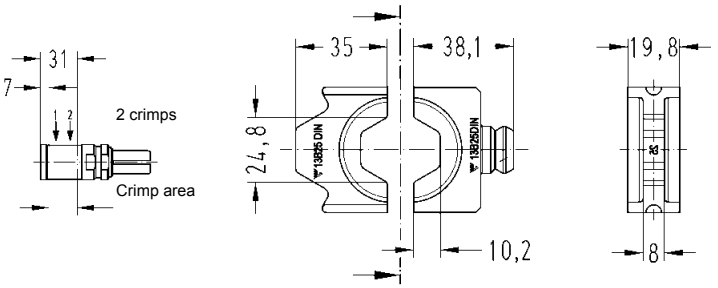
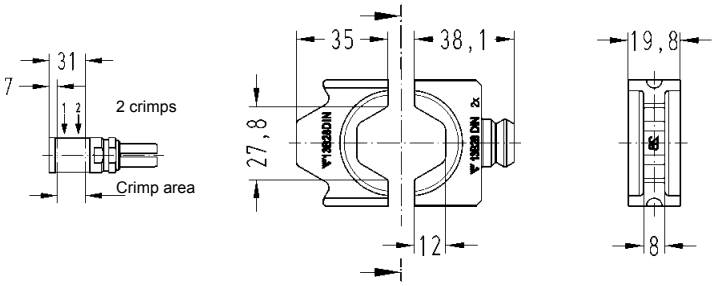
Wire gauge 240 mm²

09 99 000 0801



Tools for Han® High Current Contacts

For crimp contacts: TC 70, TC 100, TC 200, TC 250, TC 350, TC 650

Identification	Part number	Drawing	Dimensions in mm
Crimp tool Battery hydraulic handtool Pressing force 130 kN	09 99 000 0815	 • Weight 5.4 kg, incl. battery • LED indication of charge status • Supplied with 2 batteries • Battery charger Li-Ion Makita, charging time 22 min.	
Die holder upper die holder	09 99 000 0817		
 lower die holder	09 99 000 0816		
Crimp die acc. to DIN 46 235 (supplied as apair) use only without die holder Wire gauge 185 mm²	09 99 000 0818		
Wire gauge 240 mm²	09 99 000 0819		

Remark: Die holder is only compatible with battery hydraulic hand crimp tool.

Han® 3 HPR Cover

Features

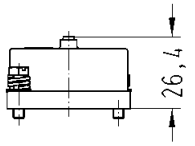
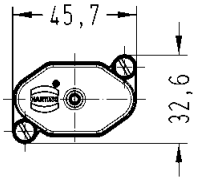
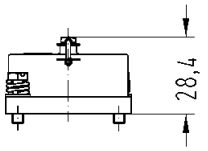
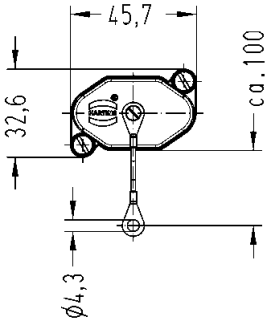
- Suitable for extreme environmental conditions
- For interfaces, that have to be protected and shielded
- Captive fixing screws
- Captive cover due to fixing cord

Technical characteristics

Material	Zinc die-cast
Colour	RAL 9005 (black)
Surface	
- Top coat	Powder-coated / chromated
Locking element	
- Screw locking	M4
- Material	Stainless steel
- Tightening torque	2 Nm
- Toggle locking	
- Material	Stainless steel
- Fixing cord	
- Material	Stainless steel
Limiting temperatures	-40 °C ... +125 °C
Corrosion resistance	ASTM B117-09 (500 h)
Degree of protection acc. to EN 60 529 in locked position	IP 68

Han® 3 HPR Cover

Cover for surface and bulkhead mounted housings

Identification	Part-Number Toggle locking	Screw	Size	Drawing	Dimensions in mm
Cover for surface and bulkhead mounted housing					
					26,4
without fixing cord, powder coated	09 40 703 5401	09 40 703 5411	3 A		45,7 / 32,6
without fixing cord, cromated	09 40 003 5401	09 40 003 5411	3 A		
					28,4
with fixing cord, powder coated	09 40 703 5402	09 40 703 5412	3 A		45,7 / 32,6 / ca.100 / ⌀4,3
with fixing cord, cromated	09 40 003 5402	09 40 003 5412	3 A		

Han® 24 HPR EasyCon

General description

- High current connector for motor applications in the field of Railway rolling stock
- Robust and compact design
- Easy assembly due to split hood and surface mounted housing
- High EMC resistance
- Large space for cables

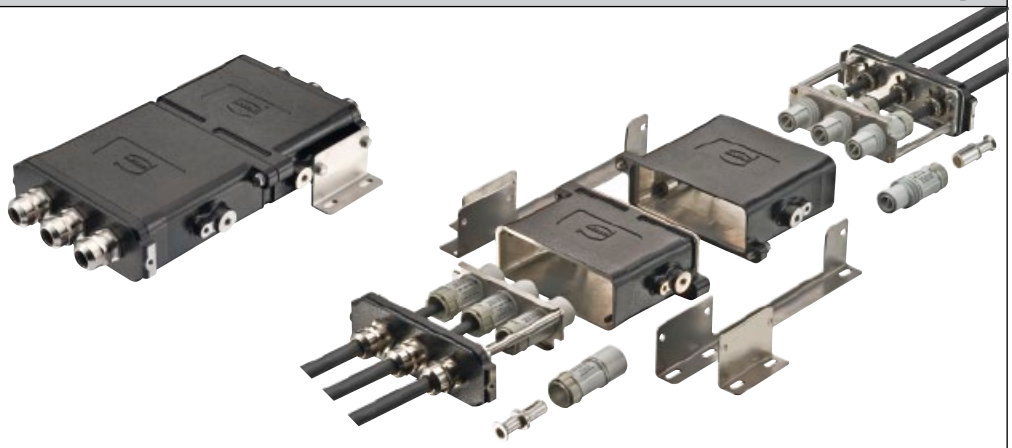
Features

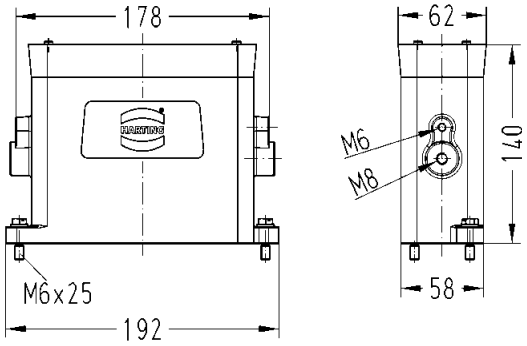
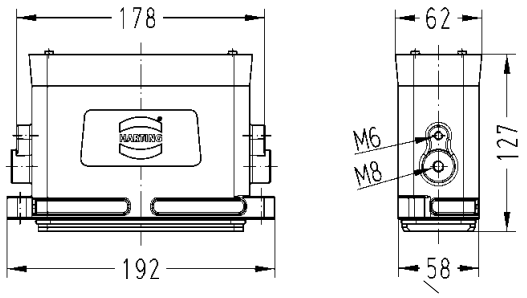
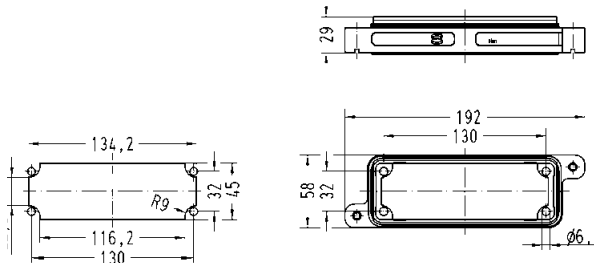
- Suitable for extreme environmental conditions
- Many assembly possibilities due to separate assembly panels
- External termination of PE termination on hood and surface mounted housing
- New cable gland for secure and a visible connection of screening braid of shielded cables.

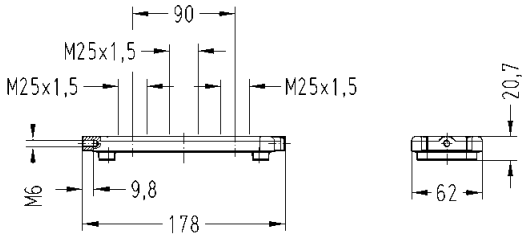
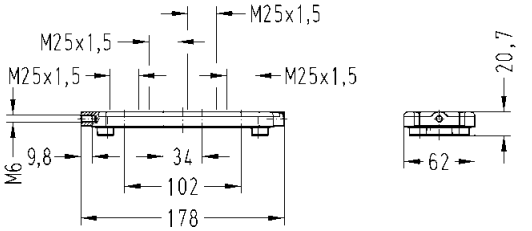
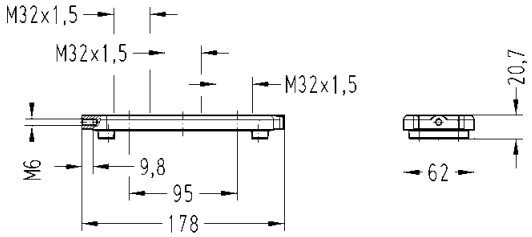
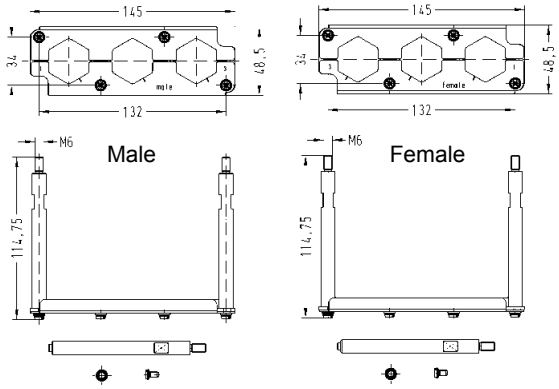
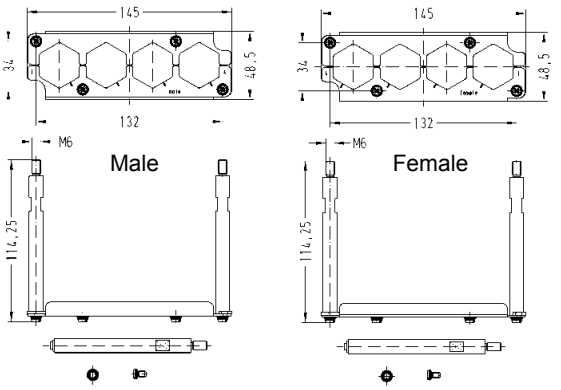
Technical characteristics

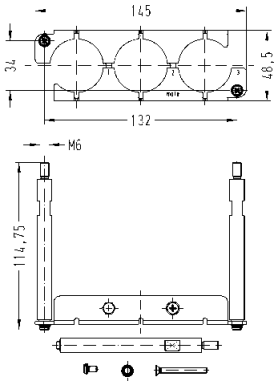
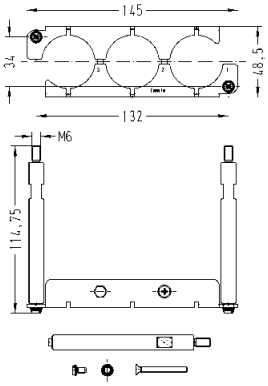
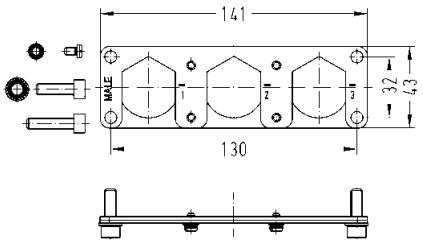
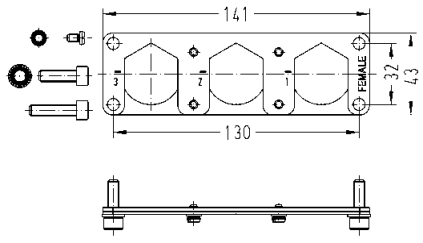
Material	Aluminium die-cast
Surface	Powder-coated, RAL 9005 (black)
Limiting temperatures	-40 °C ... 125 °C
Locking	Screw locking, M6 stainless steel
Frame	3 and 4 contacts for Han® HC Modular 350 stainless steel
	3 contacts for Han® HC Modular 650 stainless steel
Frames	Short and long version stainless steel
Cable gland	Special cable gland with self tightening clamp for shielded cables
Degree of protection acc. to EN 60 529 in locked position	IP 68

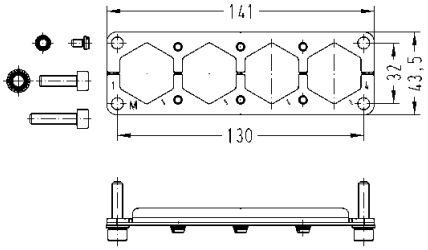
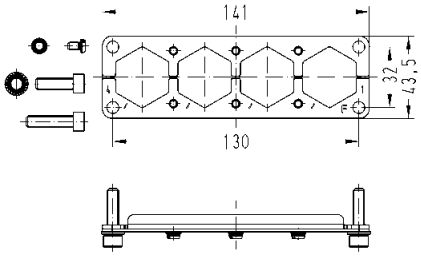
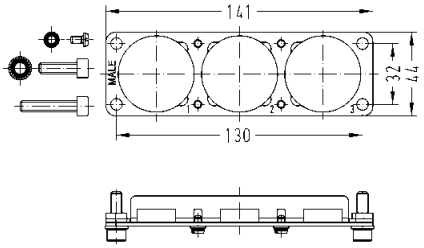
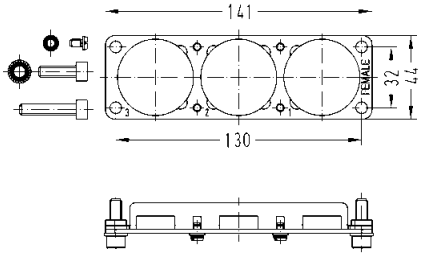
Han® 24 HPR EasyCon

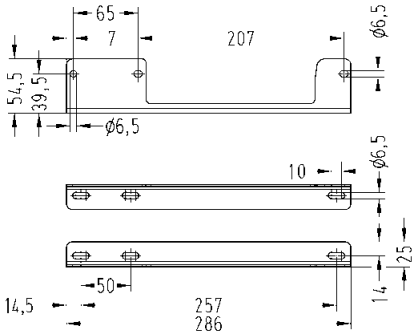
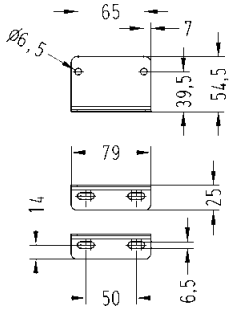


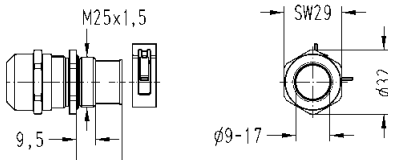
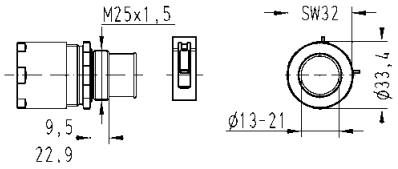
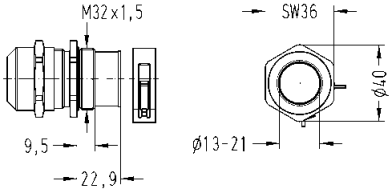
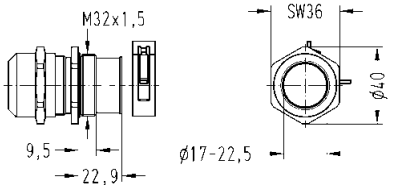
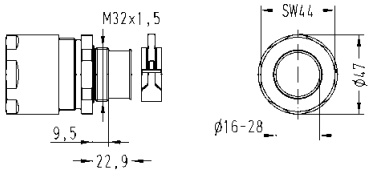
Identification	Part-Number	Drawing	Dimensions in mm
Hood 	09 40 024 0451		
Housing, surface mounting 	09 40 024 0951		
Housing, bulkhead mounting Han® HPR enlarged 	09 40 024 0368		

Identification	Part-Number	Drawing	Dimensions in mm
Covers for Han® 24 HPR EasyCon hood and surface mounting housing			
 3 x M25	19 40 024 9901		
 4 x M25	19 40 024 9902		
 3 x M32	19 40 024 9903		
Frames for 3 x Han® HC Modular 350 in Han® 24 HPR EasyCon hood and surface mounting housing		Included in kit: 2 x distance bolt (SW 7) 4 x M4 screw 4 x washer SK S4	
 Male	09 40 024 9911		
 Female	09 40 024 9912		
for 4 x Han® HC Modular 350 in Han® 24 HPR EasyCon hood and surface mounting housing		Included in kit: 2 x distance bolt (SW 7) 4 x M4 screw 4 x washer SK S4 4 x heat shrink tube	
 Male	09 40 024 9913		
 Female	09 40 024 9914		

Identification		Part-Number	Drawing	Dimensions in mm
Frames for 3 x Han® HC Modular 650 in Han® 24 HPR EasyCon hood and surface mounting housing			Included in kit: 2 x distance bolt (SW 7) 2 x M4 screw 2 x washer SK S4 2 x M4 Countersunk screw	
	Male	09 40 024 9921	Male 	
	Female	09 40 024 9922	Female 	
Frames for 3 x Han® HC Modular 350 in Han® 24 HPR enlarged bulkhead mounting housing			Included in kit: 4 x M4 screw 4 x washer SK S4 4 x washer SK S6 4 x cheese-head screw M6 x 20 4 x cheese-head screw M6 x 25	
	Male	09 11 000 9957		
	Female	09 11 000 9958		

Identification		Part-Number	Drawing	Dimensions in mm
Frames for 4 x Han® HC Modular 350 in Han® 24 HPR enlarged bulkhead mounting housing			Included in kit: 4 x M4 screw 4 x washer SK SK S4 4 x washer SK SK S6 4 x cheese-head screw M6 x 20 4 x cheese-head screw M6 x 35 4 x heat shrink tube	
	Male	09 11 000 9964		
	Female	09 11 000 9965		
Frames for 3 x Han® HC Modular 650 in Han® 24 HPR enlarged bulkhead mounting housing			Included in kit: 4 x M4 screw 4 x washer SK SK S4 4 x washer SK SK S6 4 x cheese-head screw M6 x 20 4 x cheese-head screw M6 x 35	
	Male	09 11 000 9973		
	Female	09 11 000 9974		

Identification	Part-Number	Drawing	Dimensions in mm
Mounting panels for Han® 24 HPR EasyCon hood and surface mounting housing Long version 	09 40 000 9925	Included in kit: 6 x washer M6 6 x M6 screw 	
Short version 	09 40 000 9926	Included in kit: 4 x washer M6 4 x M6 screw 	

Identification	Part-Number	Drawing	Dimensions in mm
Cable glands M25  For cable Ø 9 - 17 mm	19 00 000 5013		
 For cable Ø 13 - 21 mm	19 00 000 5019		
M32  For cable Ø 13 - 21 mm	19 00 000 5014		
For cable Ø 17 - 22.5 mm	19 00 000 5015		
 For cable Ø 16 - 28 mm	19 00 000 5022		
Assembly tool **for shielding clamp** 	09 99 000 0334		

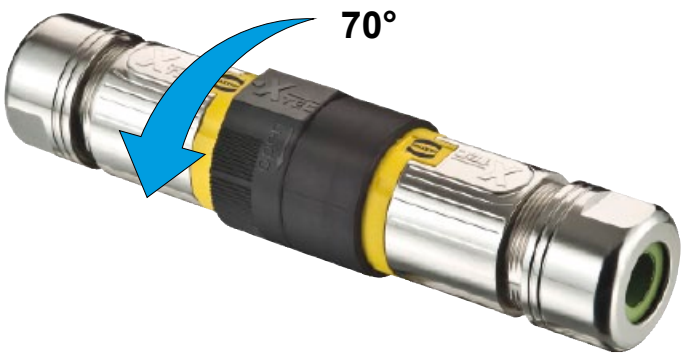
Description of the Han® X-TEC connector

Han® X-TEC - the complete circular connector system

Han® X-TEC is a complete new circular connector system in two sizes

- Han® X-TEC 23
- Han® X-TEC 32

The brand new feature of this connector series offers quick locking of connector and receptacle. Just a 70° turn of the locking element and the system is locked save and tight.



Easy and time saving selection of your favourite connector.

One part number contains insert with housing and if required the suitable cable gland as well. The female connector includes the removable locking element.

Han® X-TEC 23 is available with crimp termination:

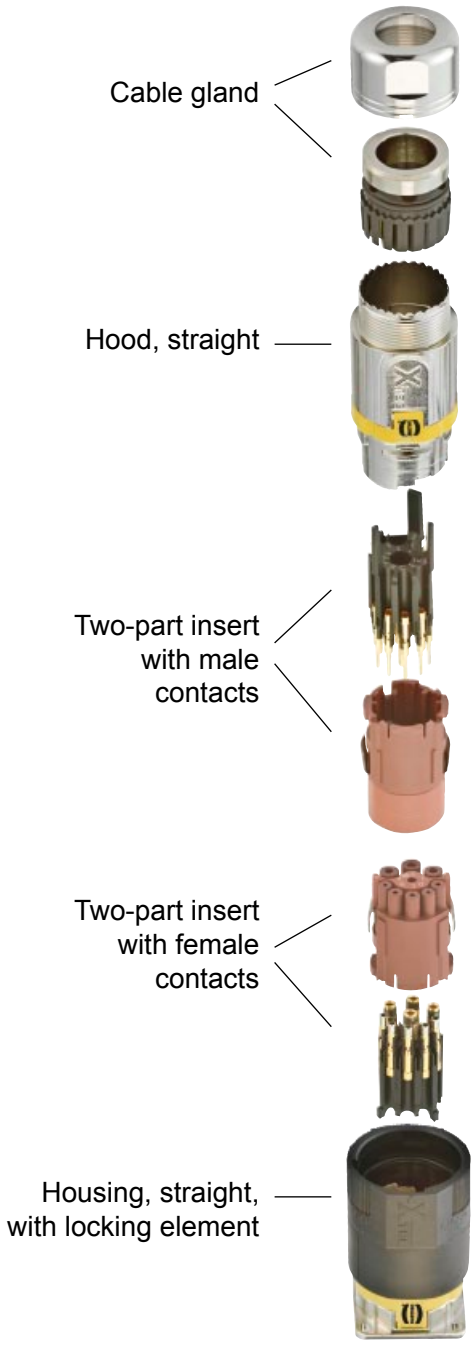
Power connector:
- 3 power contacts plus 5 signal contacts

Signal connector:
- 12 signal contacts
- 17 signal contacts

Han® X-TEC 32 is available with crimp termination:

Power Connector:
- 3 power contacts plus 5 signal contacts
- 6 power contacts plus 4 signal contacts

Assembly details



Features

- Available in metal and plastic housings
- Fast locking system saves time and ensures tight connection
- Easy to operate
- Power and signal connectors suit for Servo and Three-phase drives
- Standardized system cable solutions reduce assembling time and costs
- Power and signal contacts combined in one connector
- Reliable crimp termination

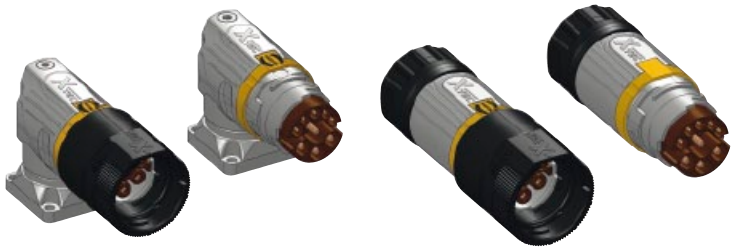
Technical characteristics

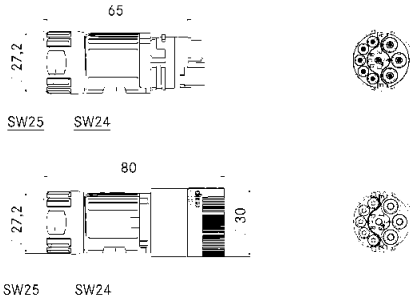
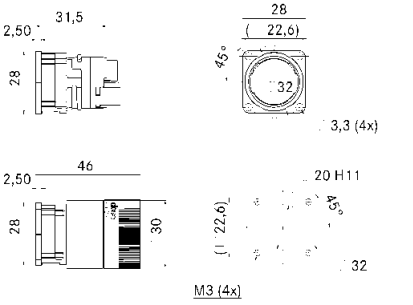
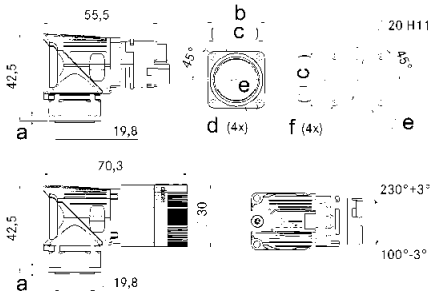
Specifications	DIN EN 60 664-1 DIN EN 61 984	
Inserts		
Number of contacts	3 / 5 + ⏚	
	Power contacts	Signal contacts
Electrical data acc. to DIN EN 61 984	**16 A 630 V 6 kV 3**	**7 A 63 V 0.8 kV 3**
Rated current	16 A	7 A
Rated voltage	630 V	63 V
Rated impulse voltage	6 kV	0.8 kV
Pollution degree	3	3
Rated voltage acc. to UL/CSA	600 V	63 V
Material	Polyamid	
Limiting temperatures	-20 °C ... +125 °C	
Flammability accd. to UL 94	V 0	
Mechanical working life	≥ 500 mating cycles	
Contacts	Power contacts	Signal contacts
Pin diameter	2 mm	1 mm
Material	Copper alloy	Copper alloy
Surface	hard-gold plated	hard-gold plated
Contact resistance	≤ 3 mΩ	≤ 5 mΩ
Crimp terminal		
- mm²	0.35 mm² ... 4 mm²	0.14 mm² ... 1.5 mm²
- AWG	22 ... 12	26 ... 16
Housings	Metal	Plastic
Material	Die cast zinc alloy	Polyamide
Surface	Nickel	-
Locking element	Polyamide	Polyamide
Sealing	FPM	FPM
Limiting temperatures	-20 °C ... +125 °C	-20 °C … +125 °C
Degree of protection acc. to DIN EN 60529 in locked position	IP 67	IP 67
Cable Ø	7.5 mm ... 17 mm	7.5 mm … 17 mm

Han® X-TEC 23 with Metal Hoods/Housings

Number of contacts

3 / 5 + ⏚



Identification	Cable diameter (mm)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Connector straight					
crimp terminal	7.5-12	09 15 408 2101	09 15 408 2201		
	9.5-14	09 15 408 2102	09 15 408 2202		
	14-17	09 15 408 2103	09 15 408 2203		
					M F
Receptacle straight					
crimp terminal	-	09 15 408 2501	09 15 408 2601		
					M F
Receptacle angled					
crimp terminal					
flange 25x25 mm	-	09 15 408 2505	09 15 408 2605		
flange 28x28 mm	-	09 15 408 2506	09 15 408 2606		
					M F
Order crimp contacts separately					

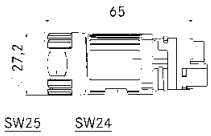
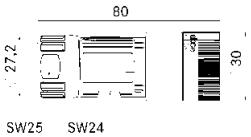
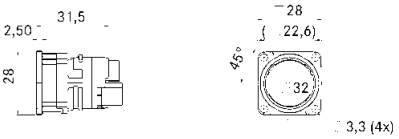
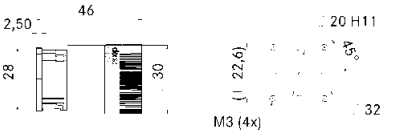
flange	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f
25x25 mm	2.5	25.7	19.8	2.7	28	M2.5
28x28 mm	4.5	28.0	22.6	3.3	32	M3

Identification	Wire gauge (mm²)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Crimp contacts					
gold plated					
contact Ø 1 mm	0.14-1.0	09 15 400 6121	09 15 400 6221		
	0.5-1.5	09 15 400 6122	09 15 400 6222		
					
contact Ø 2 mm	0.35-2.5	09 15 400 6124	09 15 400 6224		
	2.5-4.0	09 15 400 6125	09 15 400 6225		
					

Han® X-TEC 23 with Plastic Hoods/Housings

Number of contacts

3 / 5 + ⏚

Identification	Cable diameter (mm)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Connector straight					
crimp terminal	7.5-12	09 15 408 2301	09 15 408 2401		M
	9.5-14	09 15 408 2302	09 15 408 2402		
	14-17	09 15 408 2303	09 15 408 2403		
					F
Receptacle straight					
crimp terminal	-	09 15 408 2701	09 15 408 2801		M
					F
Order crimp contacts separately					

Identification	Wire gauge (mm²)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Crimp contacts					
gold plated					
contact Ø 1 mm	0.14-1.0	09 15 400 6121	09 15 400 6221		
	0.5-1.5	09 15 400 6122	09 15 400 6222		
					
contact Ø 2 mm	0.35-2.5	09 15 400 6124	09 15 400 6224		
	2.5-4.0	09 15 400 6125	09 15 400 6225		
					

Features

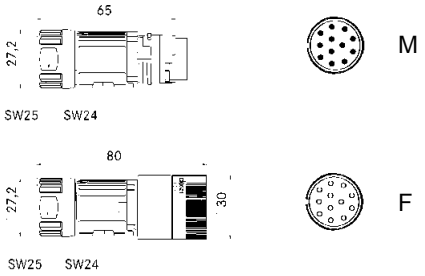
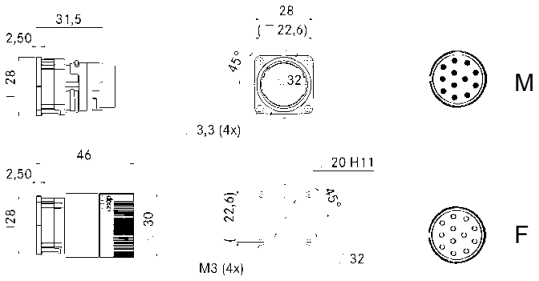
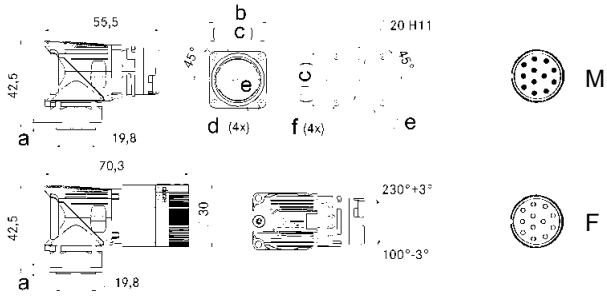
- Available in metal and plastic housings
- Fast locking system saves time and ensures tight connection
- Easy to operate
- Power and signal connectors suit for Servo and Three-phase drives
- Standardized system cable solutions reduce assembling time and costs
- Reliable crimp termination

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984	
Inserts		
Number of contacts	12 / 17 + ⏚	
	12 poles	17 poles
Electrical data acc. to DIN EN 61 984	**7 A 160 V 2 kV 3**	**7 A 125 V 2 kV 3**
Rated current	7 A	7 A
Rated voltage	160 V	125 V
Rated impulse voltage	2 kV	2 kV
Pollution degree	3	3
Rated voltage acc. to UL/CSA	125 V	125 V
Material	Polyamide	
Limiting temperatures	-20 °C ... +125 °C	
Flammability accd. to UL 94	V 0	
Mechanical working life	≥ 500 mating cycles	
Contacts		
Pin diameter	2 mm	
Material	Copper alloy	
Surface	hard-gold plated	
Contact resistance	≤ 5 mΩ	
Crimp terminal		
- mm²	0.14 mm² ... 1.5 mm²	
- AWG	26 ... 16	
Housings		
Material	Die cast zinc alloy	
Surface	Nickel	
Locking element	Polyamide	
Sealing	FPM	
Limiting temperatures	-20 °C ... +125 °C	
Degree of protection acc. to DIN EN 60529 in locked position	IP 67	
Cable Ø	7.5 mm ... 17 mm	

Number of contacts

12 + ⏚

Identification	Cable diameter (mm)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Connector straight crimp terminal	7.5-12 9.5-14.5 14-17	09 15 412 2101 09 15 412 2102 09 15 412 2103	09 15 412 2201 09 15 412 2202 09 15 412 2203		
Receptacle straight crimp terminal	-	09 15 412 2501	09 15 412 2601		
Receptacle angled crimp terminal flange 25x25 mm flange 28x28 mm	- -	09 15 412 2505 09 15 412 2506	09 15 412 2605 09 15 412 2606		

Order crimp contacts separately

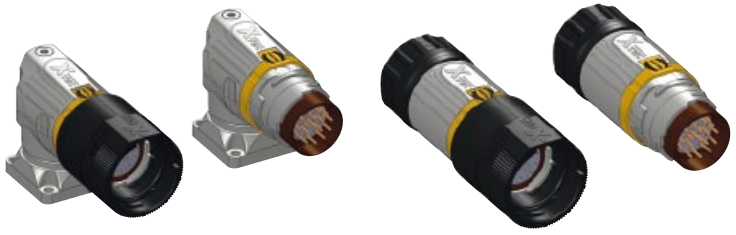
flange	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f
25x25 mm	2.5	25.7	19.8	2.7	28	M2.5
28x28 mm	4.5	28.0	22.6	3.3	32	M3

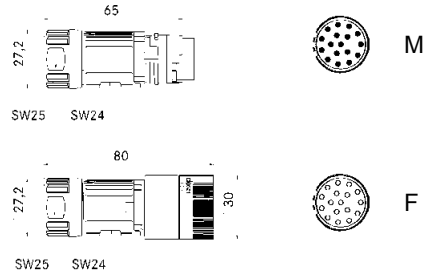
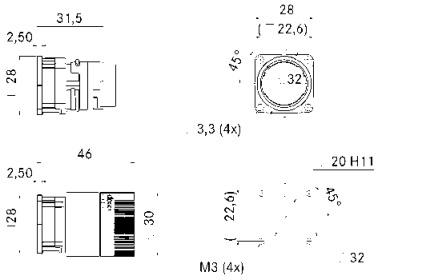
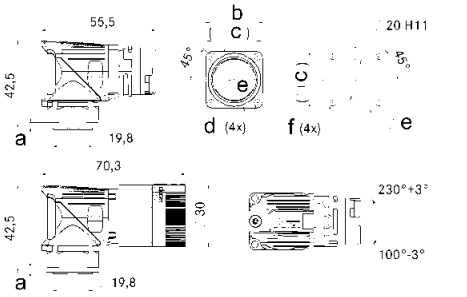
Identification	Wire gauge (mm²)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Crimp contacts gold plated contact Ø 1 mm	0.14-1.0 0.5-1.5	09 15 400 6121 09 15 400 6122	09 15 400 6221 09 15 400 6222		

Han® X-TEC 23 with Metal Hoods/Housings

Number of contacts

17 + ⏚



Identification	Cable diameter (mm)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Connector straight crimp terminal	7.5-12 9.5-14 14-17	09 15 417 2101 09 15 417 2102 09 15 417 2103	09 15 417 2201 09 15 417 2202 09 15 417 2203		M F
Receptacle straight crimp terminal	-	09 15 417 2501	09 15 417 2601		M F
Receptacle angled crimp terminal flange 25x25 mm flange 28x28 mm	- -	09 15 417 2505 09 15 417 2506	09 15 417 2605 09 15 417 2606		M F

Order crimp contacts separately

flange	a (mm)	b (mm)	c (mm)	d (mm)	e (mm)	f
25x25 mm	2.5	25.7	19.8	2.7	28	M2.5
28x28 mm	4.5	28.0	22.6	3.3	32	M3

Identification	Wire gauge (mm²)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Crimp contacts gold plated contact Ø 1 mm	0.14-1.0 0.5-1.5	09 15 400 6121 09 15 400 6122	09 15 400 6221 09 15 400 6222		

Features

- Available in metal and plastic housings
- Fast locking system saves time and ensures tight connection
- Easy to operate
- Power and signal connectors suit for Servo and Three-phase drives
- Standardized system cable solutions reduce assembling time and costs
- Power and signal contacts combined in one connector
- Reliable crimp termination

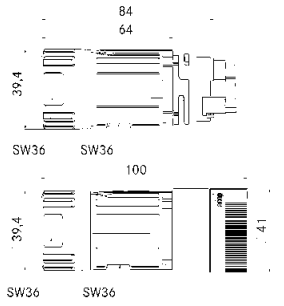
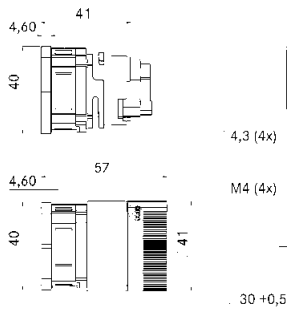
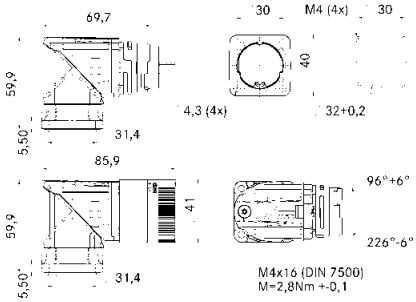
Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984	
Inserts		
Number of contacts	3 / 5 + ⏚	
	Power contacts	Signal contacts
Electrical data acc. to DIN EN 61 984	**40 A 630 V 6 kV 3**	**7 A 220 V 2.5 kV 3**
Rated current	40 A	7 A
Rated voltage	630 V	220 V
Rated impulse voltage	6 kV	2.5 kV
Pollution degree	3	3
Rated voltage acc. to UL/CSA	600 V	220 V
Material	Polyamid	
Limiting temperatures	-20 °C ... +125 °C	
Flammability accd. to UL 94	V 0	
Mechanical working life	≥ 500 mating cycles	
Contacts	Power contacts	Signal contacts
Pin diameter	3 mm	1 mm
Material	Copper alloy	Copper alloy
Surface	hard-gold plated	hard-gold plated
Contact resistance	≤ 1.2 mΩ	≤ 5 mΩ
Crimp terminal		
- mm²	1.5 mm² ... 10 mm²	0.14 mm² ... 1.5 mm²
- AWG	16 ... 8	26 ... 16
Housings	Metal	Plastic
Material	Die cast zinc alloy	Polyamide
Surface	Nickel	-
Locking element	Polyamide	Polyamide
Sealing	FPM	FPM
Limiting temperatures	-20 °C ... +125 °C	-20 °C … +125 °C
Degree of protection acc. to DIN EN 60529 in locked position	IP 67	IP 67
Cable Ø	9 mm ... 20 mm	9 mm ... 20 mm

Han® X-TEC 32 with Metal Hoods/Housings

Number of contacts

3 / 5 + ⏚

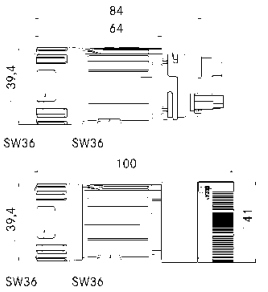
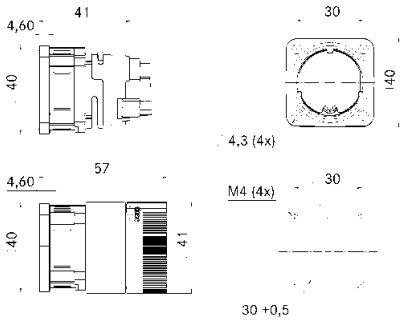
Identification	Cable diameter (mm)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Connector straight crimp terminal	9-14 12-20	09 15 408 3101 09 15 408 3102	09 15 408 3201 09 15 408 3202		M F
Receptacle straight crimp terminal	-	09 15 408 3501	09 15 408 3601		M F
Receptacle angled crimp terminal Order crimp contacts separately	-	09 15 408 3505	09 15 408 3605		M F

Identification	Wire gauge (mm²)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Crimp contacts gold plated contact Ø 1 mm	0.14-1.0 0.5-1.5	09 15 400 6121 09 15 400 6122	09 15 400 6221 09 15 400 6222		
contact Ø 3 mm	6-10	09 15 400 6127	09 15 400 6227		

Han® X-TEC 32 with Plastic Hoods/Housings

Number of contacts

3 / 5 + ⏚

Identification	Cable diameter (mm)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Connector straight					
crimp terminal	9-14	09 15 408 3301	09 15 408 3401		M
	12-20	09 15 408 3302	09 15 408 3402		
	12-20*	09 15 408 3303	09 15 408 3403		F
Receptacle straight					
crimp terminal	-	09 15 408 3701	09 15 408 3801		M
					F
Order crimp contacts separately					

Identification	Wire gauge (mm²)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Crimp contacts					
gold plated					
contact Ø 1 mm	0.14-1.0	09 15 400 6121	09 15 400 6221		
	0.5-1.5	09 15 400 6122	09 15 400 6222		
					
contact Ø 3 mm	6-10	09 15 400 6127	09 15 400 6227		
					

* cable entry for flexible conduits

Features

- Available in metal and plastic housings
- Fast locking system saves time and ensures tight connection
- Easy to operate
- Power and signal connectors suit for Servo and Three-phase drives
- Standardized system cable solutions reduce assembling time and costs
- Power and signal contacts combined in one connector
- Reliable crimp termination

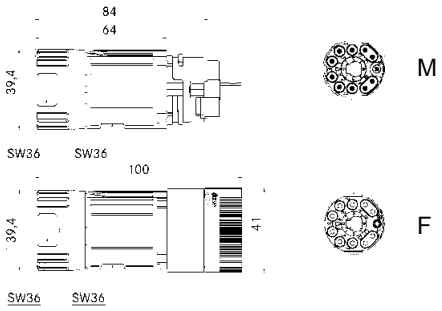
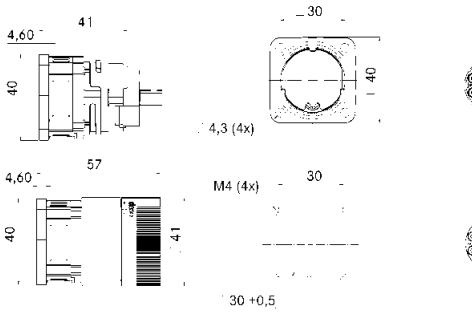
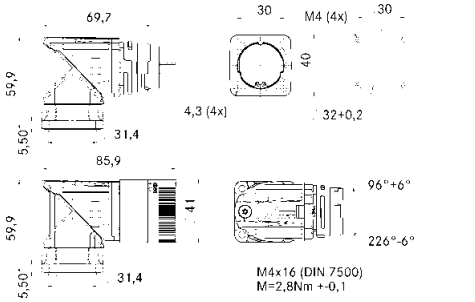
Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984	
Inserts		
Number of contacts	6 / 4 + ⏚	
	Power contacts	Signal contacts
Electrical data acc. to DIN EN 61 984	**16 A 630 V 6 kV 3**	**7 A 220 V 2.5 kV 3**
Rated current	16 A	7 A
Rated voltage	630 V	220 V
Rated impulse voltage	6 kV	2.5 kV
Pollution degree	3	3
Rated voltage acc. to UL/CSA	600 V	220 V
Material	Polyamid	
Limiting temperatures	-20 °C ... +125 °C	
Flammability accd. to UL 94	V 0	
Mechanical working life	≥ 500 mating cycles	
Contacts	Power contacts	
Pin diameter	2 mm	
Material	Copper alloy	
Surface	hard-gold plated	
Contact resistance	≤ 3 mΩ	
Crimp terminal		
- mm²	0.35 mm² ... 4 mm²	
- AWG	22 ... 12	
Housings	Metal	Plastic
Material	Die cast zinc alloy	Polyamide
Surface	Nickel	-
Locking element	Polyamide	Polyamide
Sealing	FPM	FPM
Limiting temperatures	-20 °C ... +125 °C	-20 °C … +125 °C
Degree of protection acc. to DIN EN 60529 in locked position	IP 67	IP 67
Cable Ø	9 mm ... 20 mm	9 mm ... 20 mm

Han® X-TEC 32 with Metal Hoods/Housings

Number of contacts

6 / 4 + ⏚

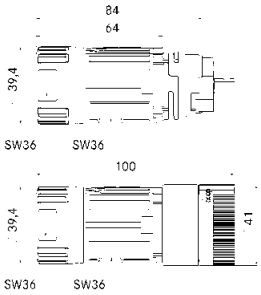
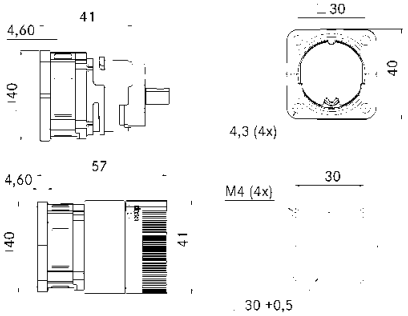
Identification	Cable diameter (mm)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Connector straight crimp terminal	9-14 12-20	09 15 410 3101 09 15 410 3102	09 15 410 3201 09 15 410 3202		M F
Receptacle straight crimp terminal	-	09 15 410 3501	09 15 410 3601		M F
Receptacle angled crimp terminal Order crimp contacts separately	-	09 15 410 3505	09 15 410 3605		M F

Identification	Wire gauge (mm²)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Crimp contacts gold plated contact Ø 2 mm	0.35-2.5 2.5-4	09 15 400 6124 09 15 400 6125	09 15 400 6224 09 15 400 6225		

Han® X-TEC 32 with Plastic Hoods/Housings

Number of contacts

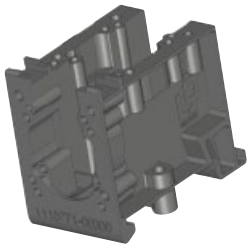
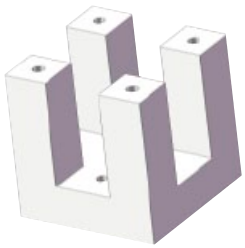
6 / 4 + ⏚

Identification	Cable diameter (mm)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Connector straight crimp terminal	9-14 12-20 12-20*	09 15 410 3301 09 15 410 3302 09 15 410 3303	09 15 410 3401 09 15 410 3402 09 15 410 3403		M F
Receptacle straight crimp terminal	-	09 15 410 3701	09 15 410 3801		M F
Order crimp contacts separately					

Identification	Wire gauge (mm²)	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Crimp contacts gold plated contact Ø 2 mm	0.35-2.5 2.5-4	09 15 400 6124 09 15 400 6125	09 15 400 6224 09 15 400 6225		

* cable entry for flexible conduits

Han® X-TEC 32 Accessories

Identification	Part-Number	Drawings	Dimensions in mm
Top-hat rail adapter 90°			
for Han® X-TEC 23	09 15 400 9901		
for Han® X-TEC 32	09 15 400 9903		
Top-hat rail adapter 45°			
for Han® X-TEC 23	09 15 400 9902		
Locking element			
for Han® X-TEC 23	09 15 400 9905		
for Han® X-TEC 32	09 15 400 9906		

Identification	Part Number	Drawings	Dimensions in mm

Crimping tool

contact Ø 1 mm — 09 99 000 0821

Part Number		Wire gauge		Tool adjustment
Male insert (M)	Female insert (F)	(mm²)	AWG	
09 15 400 6121	09 15 400 6221	0.14	26	4
		0.25	24	5
		0.34	22	6
		0.50	20	6
		0.75	18	7
		1.00	18	8
09 15 400 6122	09 15 400 6222	0.50	20	6
		0.75	18	5
		1.00	18	6
		1.50	16	7

Crimping tool

contact Ø 2 mm — 09 99 000 0822

Locator contact Ø 2 mm — 09 99 000 0823

Part Number		Wire gauge		Tool adjustment
Male insert (M)	Female insert (F)	(mm²)	AWG	
09 15 400 6124	09 15 400 6224	0.35	22	5
		0.50	20	5
		0.75	18	6
		1.00	18	6
		1.50	16	7
		2.50	14	8
09 15 400 6125	09 15 400 6225	2.50	14	4
		4.00	12	5

Crimping tool

contact Ø 3 mm — 09 99 000 0824

Locator contact Ø 3 mm — 09 99 000 0825

Part Number		Wire gauge		Tool adjustment
Male insert (M)	Female insert (F)	(mm²)	AWG	
09 15 400 6127	09 15 400 6227	6	10	4
		10	8	6

Crimping machine TK-M

Features

- ❏ Fast stripping and crimping in one operation
- ❏ Basic unit in compact construction
- ❏ Simple handling because of well-arranged construction with touchscreen controlling
- ❏ For individual, turned male and female contacts (for the HARTING series Han D®, Han E®)
- ❏ Selective processing of male and female contacts (Wire gauge from 0.34 mm² to 4.0 mm², AWG 22 to AWG 12)
- ❏ Contact magazine with filling control
- ❏ Reproducible, top quality gas-tight crimp connections
- ❏ Infinitely variable adjustment parameters
  – Stripping depth
  – Stripping length
  – Crimping depth
  – Crimp contact feed rate
- ❏ Rotatable vibration feeder and actuator in basic unit
- ❏ Low noise level
- ❏ For oil-free compressed air
- ❏ Very low setup effort
- ❏ Low maintenance costs of the modular construction

Technical characteristics

Dimensions:	
Height	580 mm
Width	470 mm
Depth	470 mm
Total weight:	Approx. 60 kg
Local noise level:	< 75 dB (A)
Drive:	Electro-pneumatic
Electrical connection:	230 V, 50 Hz
Power rating:	Approx. 0.75 kW
Pneumatic pressure:	6 bar
Compressed air connection:	3 dm³ / work cycle
Control system:	PLC
Work cycle trigger:	Sensor
Machine work cycle:	2 seconds (stripping and crimping)
Crimp type:	Four-notch crimping
Contact feed:	Vibratory bowl feed
Stroke counters:	Resettable daily counter and quantity preselection

Crimping machine TK-M

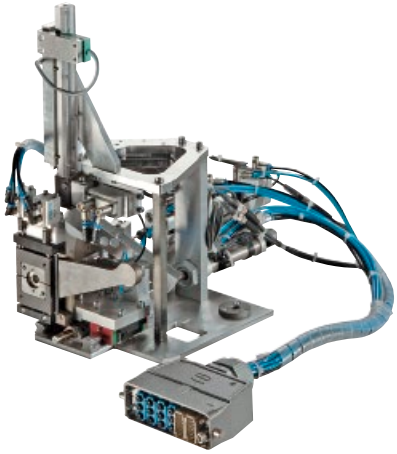
Identification	Part No.
Crimping machine TK-M (Basic machine without interchangeable unit)	09 98 000 6900
Interchangeable units for Han D® Han E®	09 98 000 6901 09 98 000 6902

Pack contents

- ❏ Crimping machine TK-M
  - – with one mounted interchangeable unit
  - – with 2.0 m connection cable and grounding plug
  - – with 2.0 m pneumatic hose with plug-in nipple N6
- ❏ Plug gauges for setting the crimping
- ❏ Centering bush for positioning the plug gauges
- ❏ Drawer for holding the contacts when the magazine is emptied
- ❏ Draw for insulation remains
- ❏ Tool set for setting
- ❏ 1 set of stripping blades
- ❏ Operating instructions
- ❏ Declaration of conformity

Options

Interchangeable unit



Stock items in bold type

Crimping machine TC-SC

Features

- ❏ Fast stripping and crimping in one operation
- ❏ Basic unit in compact construction
- ❏ Simple handling because of well-arranged construction with touchscreen controlling
- ❏ For individual, turned male and female contacts
  (for the HARTING series Han D®, Han E®, Han® C, Han P®, Han-Yellock®, D- Sub)
- ❏ Selective processing of male and female contacts
  (Wire gauge from 0.14 mm² to 10.0 mm², AWG 28 to AWG 8)
- ❏ Contact magazine with filling control
- ❏ Reproducible, top quality gas-tight crimp connections
- ❏ Motor-driven variable adjustment parameters
  – Stripping depth
  – Stripping length
  – Crimping depth
  – Wire position
- ❏ Infinitely variable adjustment parameters
  – Wire retention force
  – Crimp contact feed rate
- ❏ Low noise level
- ❏ For oil-free compressed air
- ❏ Very low setup effort
- ❏ Low maintenance costs of the modular construction

Technical characteristics

Dimensions:	
Height	480 mm
Width	650 mm
Depth	560 mm
Total weight:	Approx. 75 kg
Local noise level:	< 75 dB (A)
Drive:	Electro-pneumatic
Electrical connection:	230 V, 50 Hz
Power rating:	1.0 kW
Pneumatic pressure:	6 bar
Compressed air connection:	3 dm³ / work cycle
Control system:	PLC
Work cycle trigger:	Sensor
Machine work cycle:	2 seconds (stripping and crimping)
Crimp type:	Four-notch crimping
Contact feed:	Vibratory bowl feed
Stroke counters:	Resettable daily counter and quantity preselection

Crimping machine TC-SC

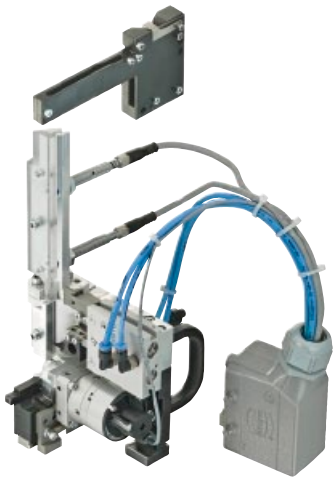
Identification	Part No.
Crimping machine TC-SC	
(Basic machine without interchangeable unit)	09 98 000 8000
Interchangeable units for Han D®	09 98 000 8101
Han E®	09 98 000 8102
Han® C	09 98 000 8103
D-Sub	09 98 000 8104
D-Sub	09 98 000 8105
Han P®	09 98 000 8106
Han-Yellock®	09 98 000 8107

Pack contents

- ❏ Crimping machine TC-SC
  - – with one mounted interchangeable unit
  - – with 2.0 m connection cable and grounding plug
  - – with 2.0 m pneumatic hose with plug-in nipple N6
- ❏ Tool set for adjustments
- ❏ 1 set of stripping blades
- ❏ Operating instructions
- ❏ Declaration of conformity

Options

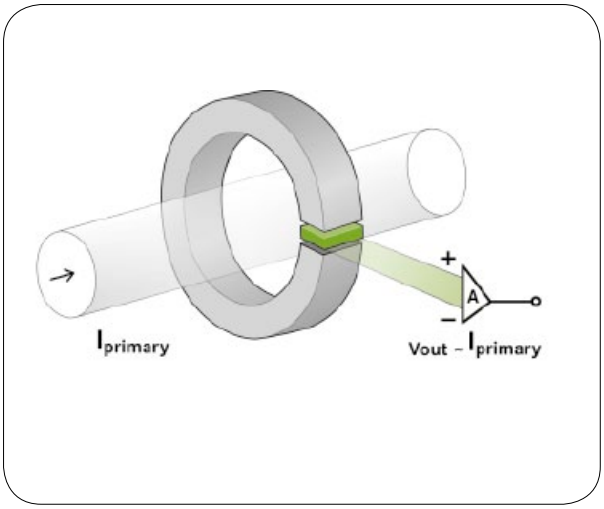
Interchangeable unit



Stock items in bold type

HARTING Hall effect current sensors measurement principles

Direct current sensor



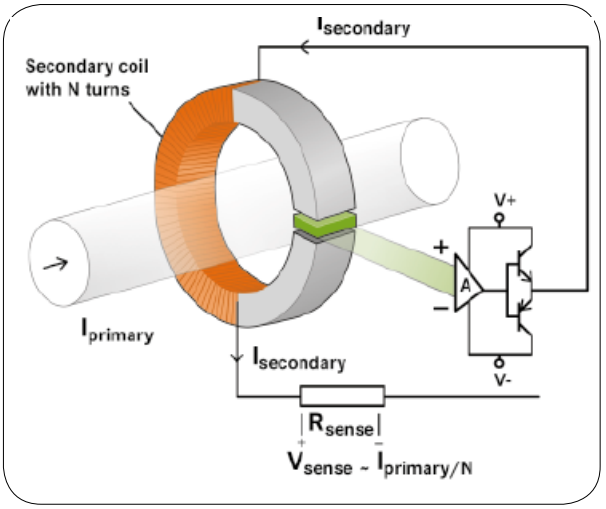
Characteristics

- Accuracy ~ 1 % of I_{Pn} at 25 °C
- Accuracy ~ 5 % at -40 … 85 °C (Max. error)
- Linearity < 0.5 %
- Delay time ~ 3 µs
- Frequency range 0 ... 25 kHz
- Nominal power supply ±15 V
- Output 4 V at I_{Pn}

Description

For open loop sensors, the primary current's magnetic field is concentrated in a magnetically soft toroid. A Hall element that generates a voltage proportional to the magnetic field or to the current is positioned in the toroid's air gap. The Hall voltage is amplified and delivers a mapping of the primary current as an output signal. One advantage of these sensors is the simple design. The temperature dependency of the Hall element and the amplification (Offset and gain drift) influence the precision, however.

Compensated current sensor



Characteristics

- Accuracy ~ 0.5 % of I_{Pn} at 25 °C
- Accuracy ~ 1 % at -40 … 85 °C (Max. error)
- Linearity < 0.1 %
- Delay time ~ 1 µs
- Frequency range 0 ... 150 kHz
- Nominal power supply ±15 V ... 24 V
- Output 100 mA at I_{Pn} (typisch)

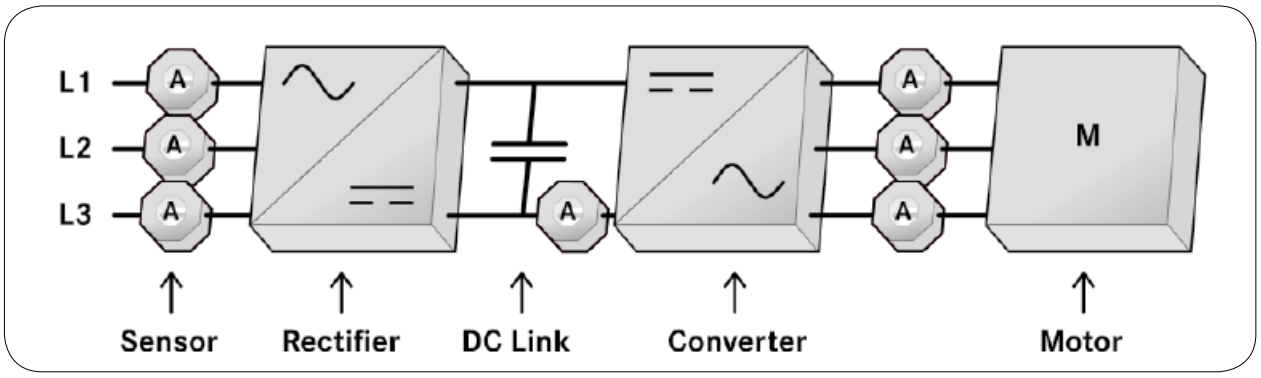
Description

Compensated current sensors (Closed-loop sensors) have a design similar to that of direct sensors. The Hall voltage, however is not used directly as measurement signal instead it is used to regulate a secondary current. The secondary current flows through a coil with N windings and generates a magnetic compensation field in the toroid. If the secondary current x N is exactly the same as the primary current, the two magnetic fields cancel each other in the toroid. The Hall element always regulates the magnetic flux to zero. The secondary current is simultaneously the sensor's output signal (I_{sec} = I_{pri}/N). These sensors consume more power, but work very precisely throughout the entire temperature range.

Application examples

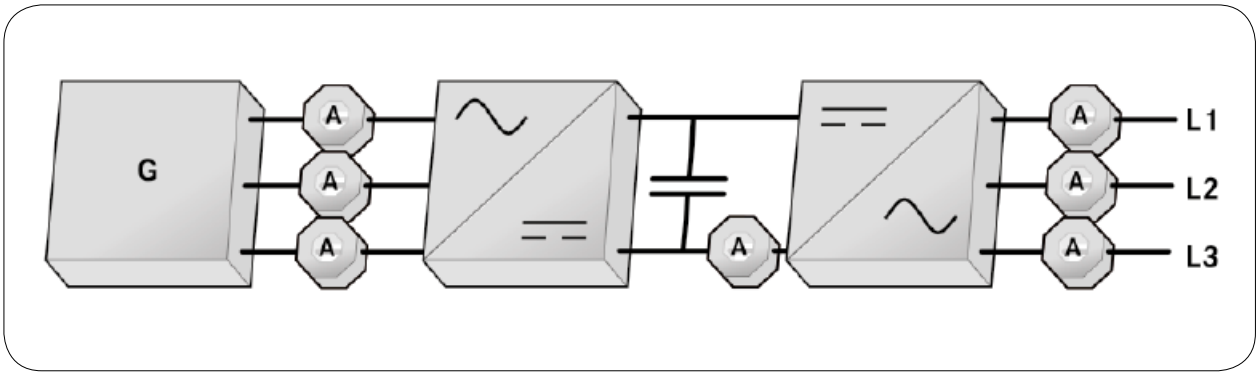
- Frequency converter for drive control

  Measurement of the input currents and motor currents to control the system and for protection of the power semiconducters



- Frequency converter for Generator-Grid connection

  Measurement of the generator currents and output currents to control the system and for protection of the power semiconducters



- Switch mode power supplies
- Uninterruptible power supplies/ Battery systems
- Electrical heating

HARTING Hall effect current sensor HCS 200 A

Features

- Hall effect compensated current sensor
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 178: Electronic equipment for use in power installations

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

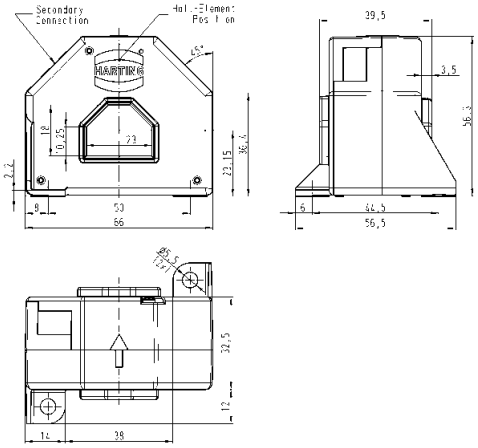
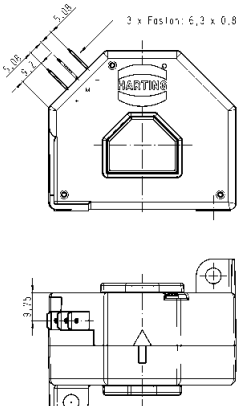
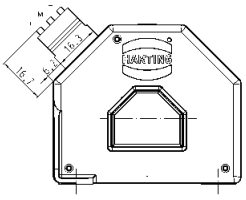
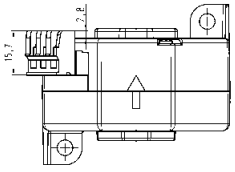
I_{PN}	Nominal primary current	200 A			
I_P	Measuring range	0 ... ±300 A			
R_M	Burden resistance				
	with ±12 V	at ±200 A max	R_M min 0	R_M max	65 Ohm
		at ±300 A max	R_M min 0	R_M max	29 Ohm
	with ±15 V	at ±200 A max	R_M min 5	R_M max	92 Ohm
		at ±300 A max	R_M min 5	R_M max	48 Ohm
I_{SN}	Nominal secondary current	100 mA			
K_N	Turns ratio	1 : 2000			
V_C	Nominal power supply (±5 %)	±12 ... 15 V			
I_C	Supply current @ VC = 15 V	20+ I_S mA			
X	Overall accuracy at I_{PN} T_A = 25 °C	±0.8 %			
E_L	Linearity	< 0.1 %			
I_O	Offset current at I_P = 0, T = 25 °C	max ±0.3 mA			
I_{OT}	Zero offset/temperatur, I_O, -40°C ... 85 °C	max ±0.8 mA			
t_r	Delay time of I_{PN}	< 1 µs			
Di/dt	di/dt correctly following	> 100 A/µs			
f	Bandwidth	DC ...100 kHz			
T_A	Operating temperature range	-40 ... +85 °C			
T_S	Storage temperature range	-45 ... +90 °C			
m	Weight	~ 0.15 kg			
RS	Coil resistance at T_A = 85 °C	38 Ohm			
V_D	Proof stress voltage, effective, 50 Hz, 1 minute	3 kV			
V_{st}	Rated impulse voltage 1.2/50 µs	10 kV			
V_B	Rated voltage [1)]	600 V			

[1)] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with clamp terminal, for other secondary connections are higher values possible

HARTING Hall effect current sensor HCS 200 A

I_{PN}= 200 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCS 200 Sensor fastening: 2 x M5 Steel screws (recommended fastening torque 4 Nm) Tolerances ±0.5 mm			
HCS 200 Connections: Faston 6.3 x 0.8 mm 3pins	**20 31 020 0101**		
HCS 200 Connections: Spring clamp terminal, pluggable Centerline 5.0 mm; 3pins	**20 31 020 0102**		
HCS 200 Clamp terminal, pluggable including signal cable 300 mm, 0.5 mm², stripped with end sleeve white - brown M green + Other secondary connections on request	**20 31 020 0202**		

HARTING Hall effect current sensor HCS 300 A

Features

- Hall effect compensated current sensor
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 178: Electronic equipment for use in power installations

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

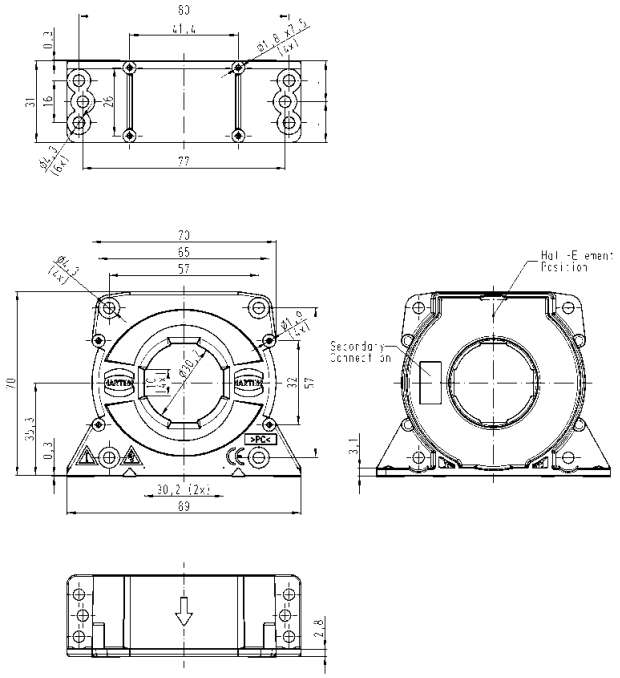
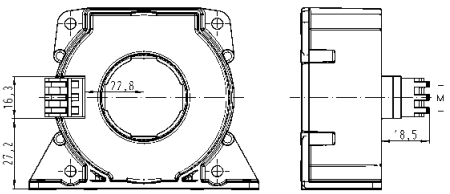
I_{PN}	Nominal primary current	300 A			
I_P	Measuring range	0 ... ±500 A			
R_M	Burden resistance				
	with ±12 V	at ±300 A max	R_M min 0	R_M max	53 Ohm
		at ±500 A max	R_M min 0	R_M max	7 Ohm
	with ±15 V	at ±300 A max	R_M min 5	R_M max	90 Ohm
		at ±500 A max	R_M min 5	R_M max	40 Ohm
I_{SN}	Nominal secondary current	150 mA			
K_N	Turns ratio	1 : 2000			
V_C	Nominal power supply (±5 %)	±12 ... 24 V			
I_C	Supply current @ VC = 15 V	25+ I_S mA			
X	Overall accuracy at I_{PN} T_A = 25°C	±0.5 %			
E_L	Linearity	< 0.1 %			
I_O	Offset current at I_P = 0, T = 25 °C	max ±0.3 mA			
I_{OT}	Zero offset/temperatur, I_O, -40 °C ... 85 °C	max ±0.7 mA			
t_r	Delay time of I_{PN}	<1 µs			
Di/dt	di/dt correctly following	>100 A/µs			
f	Bandwidth	DC ... 100 kHz			
T_A	Operating temperature range	-40 ... +85 °C			
T_S	Storage temperature range	-45 ... +90 °C			
m	Weight	~ 0.25 kg			
RS	Coil resistance at T_A= 85 °C	35 Ohm			
V_D	Proof stress voltage, effective, 50 Hz, 1 minute	3 kV			
V_{st}	Rated impulse voltage 1.2/50 µs	10 kV			
V_B	Rated voltage [1)]	600 V			

[1)] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with clamp terminal, for other secondary connections are higher values possible

HARTING Hall effect current sensor HCS 300 A

I_{PN}= 300 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCS 300 Sensor fastening: 4 x M4 Steel screws (recommended fastening torque 3.2 Nm) Tolerances ±0.5 mm			
HCS 300 Connections: Spring clamp terminal, pluggable Centerline 5.0 mm; 3pins	**20 31 030 0101**		
HCS 300 Clamp terminal, pluggable including signal cable 300 mm, 0.5 mm², stripped with end sleeve white - brown M green + Other secondary connections on request	**20 31 030 0201**		

HARTING Hall effect current sensor HCS 500 A

Features

- Hall effect compensated current sensor
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 178: Electronic equipment for use in power installations

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

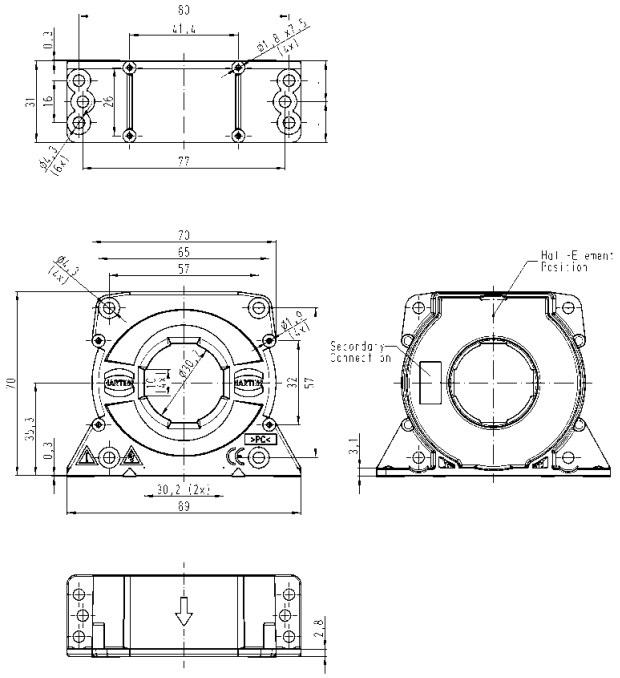
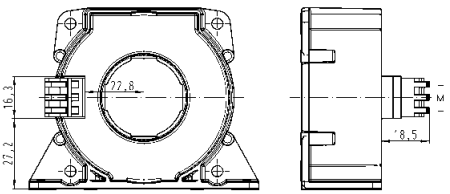
I_{PN}	Nominal primary current	500 A			
I_P	Measuring range	0 ... ±800 A			
R_M	Burden resistance				
	with ±12 V	at ±500 A max	R_M min 0	R_M max	55 Ohm
		at ±800 A max	R_M min 0	R_M max	10 Ohm
	with ±15 V	at ±500 A max	R_M min 5	R_M max	140 Ohm
		at ±800 A max	R_M min 5	R_M max	60 Ohm
I_{SN}	Nominal secondary current	100 mA			
K_N	Turns ratio	1 : 5000			
V_C	Nominal power supply (±5 %)	±15 ... 24 V			
I_C	Supply current @ VC=15 V	24+ I_S mA			
X	Overall accuracy at I_{PN} T_A= 25 °C	±0.6 %			
E_L	Linearity	< 0.1 %			
I_O	Offset current at I_P = 0, T = 25 °C	max ±0.4 mA			
I_{OT}	Zero offset/temperatur, I_O, -40 °C ... 85 °C	max ±0.7 mA			
t_r	Delay time of I_{PN}	< 1 µs			
Di/dt	di/dt correctly following	> 100 A/µs			
f	Bandwidth	DC ...100 kHz			
T_A	Operating temperature range	-40 ... + 85 °C			
T_S	Storage temperature range	-45 ... + 90 °C			
m	Weight	~ 0.25 kg			
RS	Coil resistance at T_A= 85 °C	70 Ohm			
V_D	Proof stress voltage, effective, 50 Hz, 1 minute	3 kV			
V_{st}	Rated impulse voltage 1.2/50 µs	10 kV			
V_B	Rated voltage [1)]	600 V			

[1)] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with clamp terminal, for other secondary connections are higher values possible

HARTING Hall effect current sensor HCS 500 A

I_{PN}= 500 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCS 500 Sensor fastening: 4 x M4 Steel screws (recommended fastening torque 3.2 Nm) Tolerances ±0.5 mm			
HCS 500 Connections: Spring clamp terminal, pluggable Centerline 5.0 mm; 3pins	**20 31 050 0101**		
HCS 500 Clamp terminal, pluggable including signal cable 300 mm, 0.5 mm², stripped with end sleeve white - brown M green + Other secondary connections on request	**20 31 050 0201**		

HARTING Hall effect current sensor HCS 1000 A

Features

- Hall effect compensated current sensor
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 178: Electronic equipment for use in power installations

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

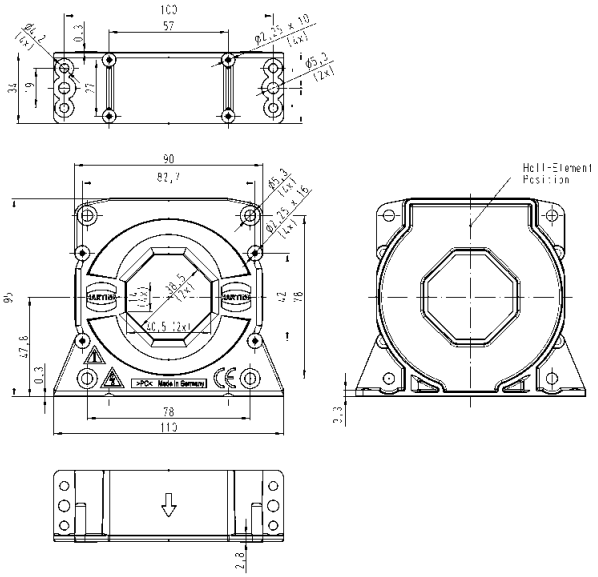
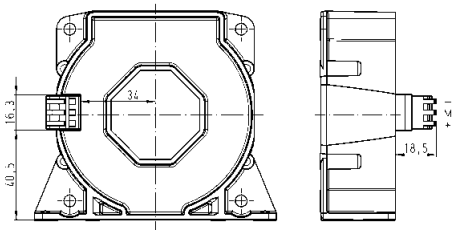
I_{PN}	Nominal primary current	1000 A			
I_P	Measuring range	0 ... ±1500 A			
R_M	Burden resistance				
	with ±15 V	at ±1000 A max	R_M min 0	R_M max	15 Ohm
	with ±24 V	at ±1000 A max	R_M min 10	R_M max	55 Ohm
		at ±1500 A max	R_M min 10	R_M max	20 Ohm
I_{SN}	Nominal secondary current	200 mA			
K_N	Turns ratio	1 : 5000			
V_C	Nominal power supply (±5 %)	±15 ... 24 V			
I_C	Supply current @ VC=15 V	28+ I_S mA			
X	Overall accuracy at I_{PN} TA = 25 °C	±0.4 %			
E_L	Linearity	< 0.1 %			
I_O	Offset current at I_P = 0, T = 25 °C	max ±0.4 mA			
I_{OT}	Zero offset/temperatur, I_O, -40 °C ... 85 °C	max ±0.8 mA			
t_r	Delay time of I_{PN}	< 1 µs			
Di/dt	di/dt correctly following	> 100 A/µs			
f	Bandwidth	DC ...100 kHz			
T_A	Operating temperature range	-40 ... +85 °C			
T_S	Storage temperature range	-45 ... +90 °C			
m	Weight	~ 0.5 kg			
RS	Coil resistance at T_A = 85 °C	44 Ohm			
V_D	Proof stress voltage, effective, 50 Hz, 1 minute	3 kV			
V_{st}	Rated impulse voltage 1.2/50 µs	12 kV			
V_B	Rated voltage [1)]	900 V			

[1)] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with clamp terminal, for other secondary connections are higher values possible

HARTING Hall effect current sensor HCS 1000 A

I_{PN}= 1000 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCS 1000 Sensor fastening: 2 x M5 Steel screws (vertical) (recommended fastening torque 4 Nm) 4 x M4 Steel screws (vertical) (recommended fastening torque 3.2 Nm) 4 x M5 Steel screws (horizontal) (recommended fastening torque 4 Nm) Tolerances ±0.5 mm			
HCS 1000 Connections: Spring clamp terminal, pluggable Centerline 5.0 mm; 3pins	**20 31 100 0101**		
HCS 1000 Clamp terminal, pluggable including signal cable 300 mm, 0.5 mm², stripped with end sleeve white - brown M green + Other secondary connections on request	**20 31 100 0201**		

HARTING Hall effect current sensor HCS 2000 A

Features

- Hall effect compensated current sensor
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 178: Electronic equipment for use in power installations
- Internal Screen between primary and secondary circuit

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

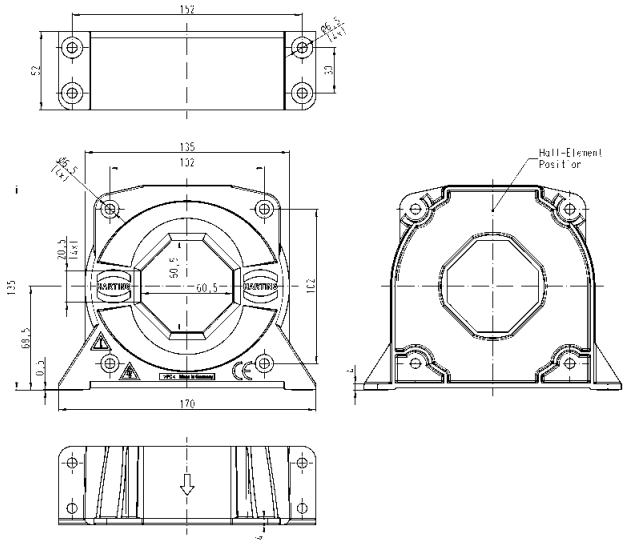
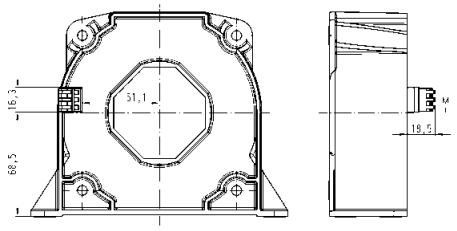
I_{PN}	Nominal primary current	2000 A			
I_P	Measuring range	0 ... ±3000 A			
R_M	Burden resistance				
	with ±15 V	at ±500 A max	R_M min 0	R_M max	7 Ohm
	with ±24 V	at ±2000 A max	R_M min 5	R_M max	27 Ohm
		at ±3000 A max	R_M min 5	R_M max	10 Ohm
I_{SN}	Nominal secondary current	400 mA			
K_N	Turns ratio	1 : 5000			
V_C	Nominal power supply (±5 %)	±15 ... 24 V			
I_C	Supply current @ VC = 15 V	33+ I_S mA			
X	Overall accuracy at I_{PN} TA = 25 °C	±0.3 %			
E_L	Linearity	< 0.1 %			
I_O	Offset current at I_P = 0, T = 25 °C	max ±0.5 mA			
I_{OT}	Zero offset/temperatur, I_O, -40 °C ... 85 °C	max ±1.2 mA			
t_r	Delay time of I_{PN}	< 1 µs			
Di/dt	di/dt correctly following	> 60 A/µs			
f	Bandwidth	DC ...100 kHz			
T_A	Operating temperature range	-40 ... +85 °C			
T_S	Storage temperature range	-45 ... +90 °C			
m	Weight	~ 1.5 kg			
RS	Coil resistance at T_A= 85 °C	24 Ohm			
V_D	Proof stress voltage, effective, 50 Hz, 1 minute	4 kV			
V_{st}	Rated impulse voltage 1.2/50 µs	15 kV			
V_B	Rated voltage [1)]	1500 V			

[1)] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with clamp terminal, for other secondary connections are higher values possible

HARTING Hall effect current sensor HCS 2000 A

I_{PN}= 2000 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCS 2000 Sensor fastening: 4 x M6 Steel screws (recommended fastening torque 4.2 Nm) Tolerances ±0.5 mm			
HCS 2000 Connections: Spring clamp terminal, pluggable Centerline 5.0 mm; 3pins Internal screen connected with minus pole	**20 31 200 0101**		
HCS 2000 Clamp terminal, pluggable including signal cable 300 mm, 0.5 mm², stripped with end sleeve white - brown M green + Other secondary connections on request	**20 31 200 0201**		

HARTING Hall effect current sensor HCSR 500 A Railway equipment

Features

- Hall effect compensated current sensor
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 155: Railway applications – Electronic Devices on Rolling Stock
- Internal Screen between primary and secondary circuit

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

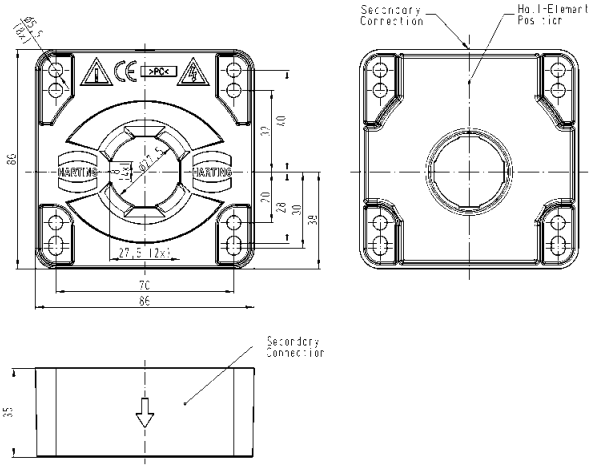
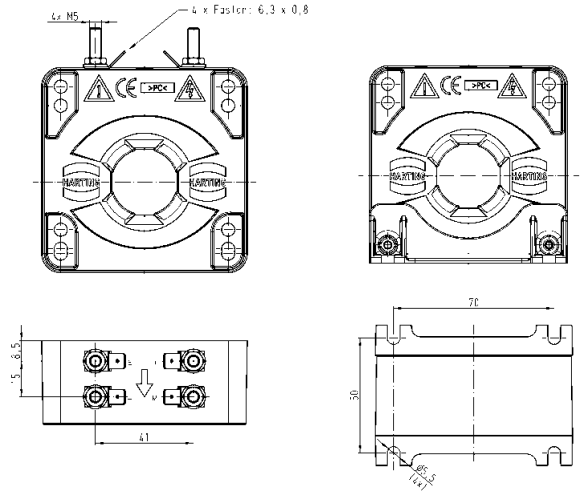
I_{PN}	Nominal primary current	500 A			
I_P	Measuring range	0 ... ±1200 A			
R_M	Burden resistance				
	with ±15 V	at ±500 A max	R_M min 0	R_M max	45 Ohm
	with ±24 V	at ±500 A max	R_M min 0	R_M max	100 Ohm
		at ±1200 A max	R_M min 0	R_M max	20 Ohm
I_{SN}	Nominal secondary current	125 mA			
K_N	Turns ratio	1 : 4000			
V_C	Nominal power supply (±5 %)	±15 ... 24 V			
I_C	Supply current @ VC = 15 V	35+ I_S mA			
X	Overall accuracy at I_{PN} T_A = 25 °C	±0.6 %			
E_L	Linearity	< 0.1 %			
I_O	Offset current at I_P = 0, T = 25 °C	max ±0.5 mA			
I_{OT}	Zero offset/temperatur, I_O, -40 °C ... 85 °C	max ±0.8 mA			
t_r	Delay time of I_{PN}	< 1 µs			
Di/dt	di/dt correctly following	> 100 A/µs			
f	Bandwidth	DC ...100 kHz			
T_A	Operating temperature range	-40 ... +85 °C			
T_S	Storage temperature range	-45 ... +90 °C			
m	Weight	~ 0.4 kg			
RS	Coil resistance at T_A = 85 °C	48 Ohm			
V_D	Proof stress voltage, effective, 50 Hz, 1 minute				
	- primary – secondary / screen	7 kV			
	- secondary / screen	0.5 kV			
V_{st}	Rated impulse voltage 1.2/50 µs	20 kV			
V_B	Rated voltage [1)]	2000 V			

[1)] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with screw terminal, for other secondary connections are other values possible

HARTING Hall effect current sensor HCSR 500 A Railway equipment

I_{PN}= 500 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCSR 500 Sensor fastening: 4x M5 Steel screws (recommended fastening torque 4 Nm) Tolerances ±0.5 mm			
HCSR 500 Connections: Screw terminal with faston; 4pins Screen connected to separate terminal without mounting feet with mounting feet	 **20 31 050 9101** **20 31 050 8101**		
HCSR 500 including shielded cable 1000 mm 0.5 mm², stripped with end sleeve 1 - (numbered white strands) 2 M 3 + Internal screen on separate terminal without mounting feet with mounting feet Other secondary connections on request	 **20 31 050 9201** **20 31 050 8201**		

HARTING Hall effect current sensor HCSR 1000 A Railway equipment

Features

- Hall effect compensated current sensor
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 155: Railway applications – Electronic Devices on Rolling Stock
- Internal Screen between primary and secondary circuit

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

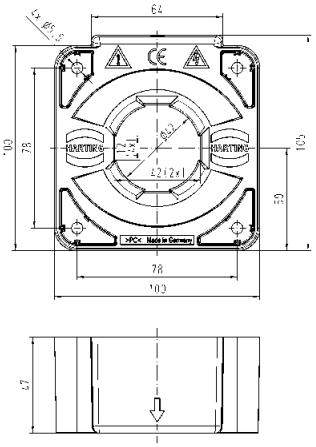
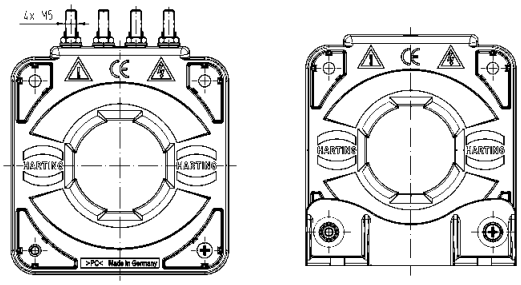
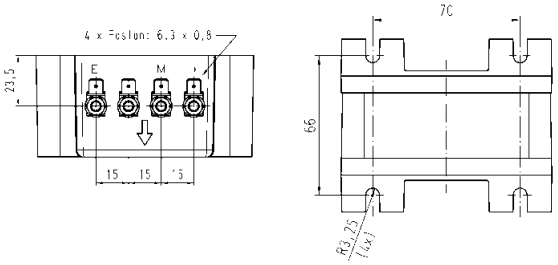
I_{PN}	Nominal primary current	1000 A			
I_P	Measuring range	0 ... ±2400 A			
R_M	Burden resistance				
	with ±15 V	at ±1000 A max	R_M min 0	R_M max	15 Ohm
	with ±24 V	at ±1000 A max	R_M min 0	R_M max	45 Ohm
		at ±2000 A max	R_M min 0	R_M max	5 Ohm
I_{SN}	Nominal secondary current	200 mA			
K_N	Turns ratio	1 : 5000			
V_C	Nominal power supply (±5 %)	±15 ... 24 V			
I_C	Supply current @ VC = 15 V	30+ I_S mA			
X	Overall accuracy at I_{PN} T_A = 25 °C	±0.4 %			
X	Overall accuracy at I_{PN} T_A = – 40 °C ... 85 °C	±1 %			
E_L	Linearity	< 0.1 %			
I_O	Offset current at I_P = 0, T = 25 °C	max ±0.5 mA			
I_{OT}	Zero offset/temperatur, I_O, -40 °C ... 85 °C	max ±0.8 mA			
t_r	Delay time of I_{PN}	< 1 µs			
Di/dt	di/dt correctly following	> 100 A/µs			
f	Bandwidth	DC ... 100 kHz			
T_A	Operating temperature range	-40 ... +85 °C			
T_S	Storage temperature range	-45 ... +90 °C			
m	Weight	~ 0.7 kg			
RS	Coil resistance at T_A = 85 °C	44 Ohm			
V_D	Proof stress voltage, effective, 50 Hz, 1 minute				
	- primary – secondary / screen	12 kV			
	- secondary / screen	1 kV			
V_{st}	Rated impulse voltage 1.2/50 µs	20 kV			
V_B	Rated voltage [1)]	2000 V			

[1)] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with screw terminal, for other secondary connections are other values possible

HARTING Hall effect current sensor HCSR 1000 A Railway equipment

I_{PN}= 1000 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCSR 1000 Sensor fastening: 4 x M5 Steel screws (recommended fastening torque 4 Nm) Tolerances ±0.5 mm			
HCSR 1000 Connections: Screw terminal with faston; 4pins Screen connected to separate terminal			
without mounting feet	**20 31 100 9101**		
with mounting feet	**20 31 100 8101**		
HCSR 1000 including shielded cable 1000 mm 0.5 mm², stripped with end sleeve 1 - (numbered white strands) 2 M 3 + Internal screen on separate terminal			
without mounting feet	**20 31 100 9201**		
with mounting feet	**20 31 100 8201**		
Other secondary connections on request			

HARTING Hall effect current sensor HCSR 2000 A Railway equipment

Features

- Hall effect compensated current sensor
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 155: Railway applications – Electronic Devices on Rolling Stock
- Internal Screen between primary and secondary circuit

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

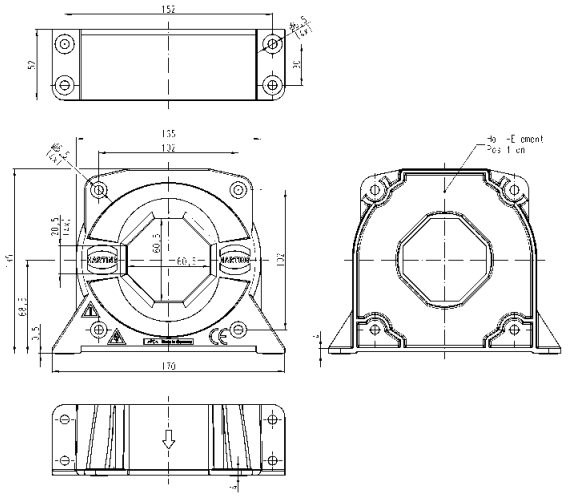
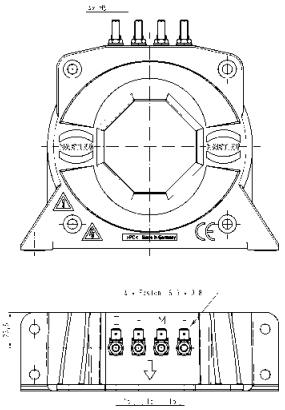
I_{PN}	Nominal primary current	2000 A			
I_P	Measuring range	3600 A			
R_M	Burden resistance				
	with ±15 V	at ±2000 A max	R_M min 0	R_M max	7 Ohm
	with ±24 V	at ±2000 A max	R_M min 3	R_M max	13 Ohm
		at ±3600 A max	R_M min 3	R_M max	3 Ohm
I_{SN}	Nominal secondary current	400 mA			
K_N	Turns ratio	1 : 5000			
V_C	Nominal power supply (±5 %)	±15 ... 24 V			
I_C	Supply current @ VC = 15 V	33+ I_S mA			
X	Overall accuracy at I_{PN} TA = 25 °C	±0.3 %			
E_L	Linearity	< 0.1 %			
I_O	Offset current at I_P = 0, T = 25 °C	max ±0.5 mA			
I_{OT}	Zero offset/temperatur, I_O, -40 °C ... 85 °C	max ±1 mA			
t_r	Delay time of I_{PN}	< 1 µs			
Di/dt	di/dt correctly following	> 100 A/µs			
f	Bandwidth	DC ...100 kHz			
T_A	Operating temperature range	-40 ... +85°C			
T_S	Storage temperature range	-45 ... +90°C			
m	Weight	~ 1.5 kg			
RS	Coil resistance at T_A= 85 °C	25 Ohm			
V_D	Proof stress voltage, effective, 50 Hz, 1 minute				
	- primary – secondary / screen	12 kV			
	- secondary / screen	1.5 kV			
V_{st}	Rated impulse voltage 1.2/50 µs	20 kV			
V_B	Rated voltage [1)]	2000 V			

[1)] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with screw terminal, for other secondary connections are other values possible

HARTING Hall effect current sensor HCSR 2000 A Railway equipment

I_{PN}= 2000 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCSR 2000 Sensor fastening: 4 x M6 Steel screws (recommended fastening torque 4.2 Nm) Tolerances ±0.5 mm			
HCSR 2000 Connections: Screw terminal with faston; 4pins Screen connected to separate terminal	**20 31 200 9101**		
HCSR 2000 including shielded cable 1000 mm 0.5 mm², stripped with end sleeve 1 - (numbered white strands) 2 M 3 + Internal screen on separate terminal Other secondary connections on request	**20 31 200 9201**		

HARTING Hall effect current sensor Eco Series 100 A ... 800 A

Features

- Direct hall effect current sensor
- I_{Pmax} = 300 A … 1000 A
- Galvanic isolation between primary and secondary current.
- Panel mounting
- Housing material and potting mass have a flammability rating UL94 V0
- Standard EN 50 178: Electronic equipment for use in power installations

Advantages

- High accuracy
- Wide measuring range
- High current overload capability
- Very low susceptance to external magnetic fields

Technical characteristics

HCSE 100

I_{PN}	Nominal primary current	100 A
I_P	Measuring range	0 ... ±300 A

HCSE 300

I_{PN}	Nominal primary current	300 A
I_P	Measuring range	0 ... ±900 A

HCSE 500

I_{PN}	Nominal primary current	500 A
I_P	Measuring range	0 ... ±1000 A

HCSE 800

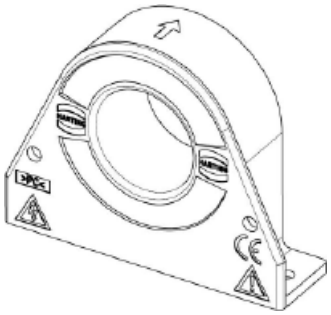
I_{PN}	Nominal primary current	800 A
I_P	Measuring range	0 ... ±1000 A

V_{out}	Output voltage at I_{PN}	4 V
R_L	Load resistance	>1 kOhm
V_C	Nominal power supply (±5 %)	±15 V
I_C	Supply current @ VC = 15 V	< 25 mA
R_{IN}	Insulation Resistance	> 500 MOhm
X	Accuracy at I_{PN} TA= 25°C without Offset	±1 %
E_L	Linearity	< 0.1 %
V_O	Offset Voltage at I_P = 0, T = 25 °C	±10 mV
V_{OOL}	Offset after I_{Pmax}	±10 mV
V_{OT}	Thermal Offset drift, T = -25°C … +85°C	±1 mV/K
V_{outT}	Thermal Gain drift, T = -25 °C … +85 °C	±0.05 %/K
t_r	Delay time of I_{PN}	< 3 µs
Di/dt	di/dt correctly following	> 50 A/µs
f	Bandwidth	DC ...100 kHz

T_A	Operating temperature range	-25 ... +85 °C
T_S	Storage temperature range	-25 ... +90 °C
m	Weight	~ 0.2 kg
V_D	Proof stress voltage, effective, 50 Hz, 1 minute	3.5 kV
V_B	Rated voltage [1]	690 V

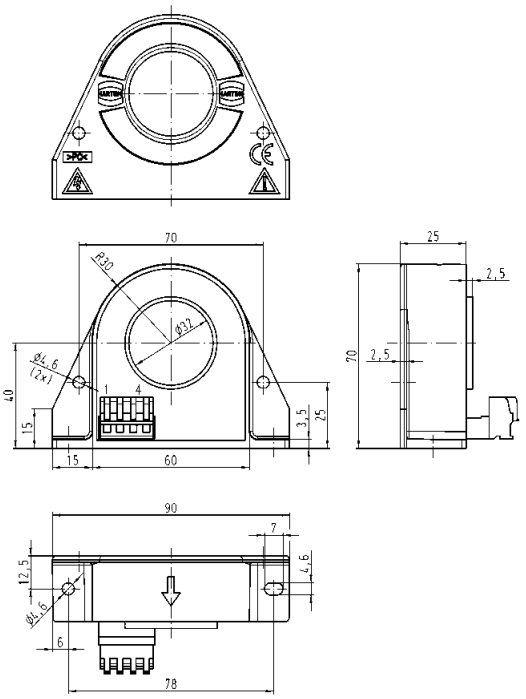
[1] Safe separation (Overvoltage Category III, Polution degree 2). Value applies for sensors with clamp terminal, for other secondary connections are higher values possible

HARTING Hall effect current sensor Eco Series 100 A ... 800 A



I_{PN}= 100 A ... 800 A

Measureable currents are AC, DC, pulsed …

Identification	Part number	Drawing	Dimensions in mm
HCSE 100 – HCSE 800 Sensor fastening: 2 x M4 Steel screws (recommended fastening torque 3.2 Nm) Tolerances ±0.5 mm			
HCSE 100	**20 32 010 0101**		
HCSE 300	**20 32 030 0101**		
HCSE 500	**20 32 050 0101**		
HCSE 800	**20 32 080 0101**		
Connections: Spring clamp terminal, pluggable Centerline 5.0 mm; 4pins Pin output: 1 +15 V 2 -15 V 3 Signal 4 0 V			

Definitions

	Definitions	
I_{PN}	Nominal primary current	RMS Value for AC Currents
I_P	Primary current, measuring range	Maximum measureable Current, Overloads <5 x I_P do not damage the Sensor but will cause an additional Offset. The measurement range depends on the hight of the supply voltage and the burdne resistor. See formular in line R_M
X	Accuracy at I_{PN} T_A = 25°C	Total error in % of I_{PN} at T_A = 25 °C including Offset at 25 °C und Linearity deviation. Compensated current sensor: Total error in % over whole temperature range = X+ (I_{OT} [mA]/I_{SN}[mA] *100) Direct current sensor: Total error in % over whole temperature range = X+ max. Offset drift + max. gain drift = X + (V_{OT}[mV/K]*60K)/V_{out}*100) + V_{outT}*60K
t_r	Response time of I_{PN}	Time difference in which the primary current and the measurement signal reach 90% of the end value
Di/dt	di/dt at optimal magnetic coupling	Maximum current rise rate correcly followed with an optimal magnetic coupling. Optimal magnetic coupling: Primary conductor is positioned in the middle of the sensor opening, no magnetic interference fields in the proximity of the sensor
f	Frequency range (-1dB)	Small signal bandwidth of the sensor electronic, measureable harmonic waves. At higher frequencies of the primary current (>5 kHz, dependig on the sensor type) I_P has to be reduced to avoid overheating of the transducer. Maximum allowed temperature of the sensor is 120 °C.
R_M	Burden resistance	Compensated current sensors: The larger the burden resistor R_M the lower the measuring range I_P $I_P = (V_C - V_A)/(Rm + Rs) \times N$ V_A = Voltage drop internal amplifier

V_A in V	200 A	300 A	500 A	1000 A	2000 A
HCS	1.5	1.5	1	1	1
HCSR			1.5	1.5	1.5

Remarks

- If I_P flows in the direction of the Arrow I_{Sek} is positive
- Over currents (»I_{PN}) or the missing of the supply voltage can cause an additional remaining magnetic offset
- The temperature of the primary conductor may not exceed 100 °C

- This Sensors may only be used in electrical or electronic systems which fulfill the relevant regulations (Standards, EMC Requirements,…)

- Pay attention to protect non-isolated high-voltage current carrying parts against direct contact (e.g. with a protective housing)
- When installing this sensor you must ensure that the safe separation (between primary circuit and secondary circuit) is maintained over the whole circuits and their connections
- The Sensor may only be connected to a power supply respecting the SELV/PELV protective regulations acc. to EN 50 178
- Disconnecting the main power must be possible

Ha-VIS FTS 3000

(in preparation)

Ethernet Switch
Ha-VIS FTS 3100s-A

10-port Ethernet Switch with Fast Track Technology
configurable via USB

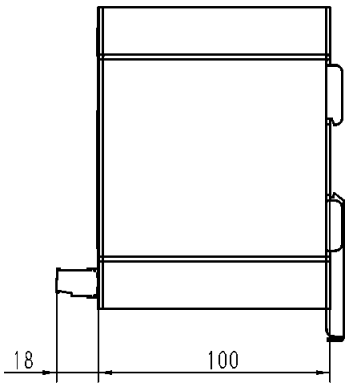
Advantages

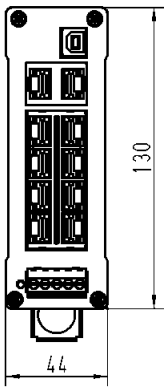
- Identification, acceleration and preference for automation frames
- Deterministic data transfer for selected profiles
- Ethernet Switch acc. IEEE 802.3, individually configurable via USB
- Fast Track Switching Mode, Store and Forward Switching mode
- Robust metal housing, RoHS compliant

General Description

The Fast Ethernet Switches of the product family Ha-VIS FTS 3000 can identifiy automation profiles (e.g PROFINET, EtherNet/IP, Modbus TCP and customized profiles), accelerate their data transmission and prefer them. They are suitable for industrial applications.
The product family enables the connection of up to 10 network devices over shielded Twisted Pair. It supports Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s).
The Ethernet Switch works as an unmanaged switch and can work in Fast Track Switching mode and in Store and Forward mode. It supports Auto-crossing, Auto-negotiation and Auto-polarity.

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS FTS 3100s-A			
FTS Ethernet Switch with 10 ports RJ45	20 78 110 1000		
for top-hat mounting rail			





Technical characteristics

Features	• Auto-crossing • Auto-negotiation • Auto-polarity • Store and Forward Switching mode • Fast Track Switching mode
Ethernet Interface	
Number of ports	• 10x 10/100Base-TX, unmanaged
Cable types acc. to IEEE 802.3	• Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	• 10/100 Mbit/s (RJ45)
Maximum cable length	• 100 m (Twisted Pair; with cable Category 5 acc. to EN 50 173-1)
Terminating method	• RJ45 (Twisted Pair)
Diagnostics (via LED)	• Status Link: Green • Status Data transfer (Act): Green flashing • Data transfer rate (Speed): 100 Mbit/s: Yellow / 10 Mbit/s: Green
Topology	• Line, Star or mixed
Parameterisation via USB	• Auto-negotiation • 10/100 Mbit/s • Full/Half Duplex • Port enable/disable • Port mirroring • Flow Control • FTS Port enable/disable • Industrial Profile (PROFINET, EtherNet/IP, Modbus TCP, customized) • NRT Bandwidth Control
Power Supply	
Power supply	24 V ⎓
Permissible range	9,6 V ... 60 V ⎓
Current consumption	270 mA (at 24 V ⎓)
Diagnostics (via LED)	• Power supply in permissible range: Green • Undervoltage: Red
Terminating Power supply	5-pole pluggable screw contact, for redundant power supply
Design features	
Material of housing	Aluminium, anodized
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN 60 529	IP 30
Mounting	• 35 mm top-hat rail acc. to EN 60 715 • Panel mounting, vertical assembly
Weight	approx. 0.5 kg
Environmental conditions	
Operating temperature	0 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Relative humidity	30 % ... 95 % (non-condensing)

Ha-VIS FTS 3000

(in preparation)

Ethernet Switch
Ha-VIS FTS 3060-A

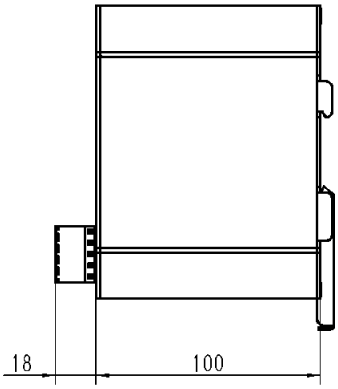
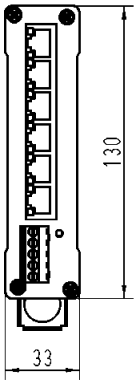
6-port Ethernet Switch with Fast Track Switching Technology
managed

Advantages

- Identification, acceleration and preference for automation frames
- Deterministic data transfer for selected profiles
- Managed Ethernet Switch acc. to IEEE 802.3
- Fast Track Switching Mode, Store and Forward Switching mode
- Robust metal housing, RoHS compliant

General Description

The Fast Ethernet Switches of the product family Ha-VIS FTS 3000 can identifiy automation profiles (e.g PROFINET, EtherNet/IP, Modbus TCP and customized profiles), accelerate their data transmission and prefer them. They are suitable for industrial applications.
The Ha-VIS FTS 3060-A enables the connection of up to 6 network devices over shielded Twisted Pair. It supports Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s).
The Ethernet Switch works as a managed switch and can work in Fast Track Switching Mode and in Store and Forward mode. It supports Auto-crossing, Auto-negotiation and Auto-polarity.

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS FTS 3060-A Ethernet Switch with 6 ports RJ45 for top-hat mounting rail	20 78 106 4000		

Technical characteristics

Features	• Auto-crossing • Auto-negotiation • Auto-polarity • Store and Forward Switching mode • Fast Track Switching mode
Ethernet Interface	
Number of ports	• 6x 10/100Base-TX, managed
Cable types acc. to IEEE 802.3	• Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), min. Category 5
Data rate	• 10 Mbit/s or 100 Mbit/s (RJ45)
Maximum cable length	• 100 m (Twisted Pair; with cable Category 5 acc. to EN 50 173-1)
Terminating method	• RJ45 (Twisted Pair)
Diagnostics (via LED)	• Status Link: Green • Status Data transfer (Act): Green flashing • Data transfer rate (Speed): 100 Mbit/s: Yellow / 10 Mbit/s: Green
Topology	• Line, Ring, Star or mixed
Basic functions	
Port settings	• 10/100 Mbit/s • Full/Half Duplex • Port enable/disable • Port mirroring • Flow Control • Industrial Profile (PROFINET, EtherNet/IP, Modbus TCP, customized) • NRT Bandwidth Control
Management functions	• STP, RSTP • IGMP Snooping with support for querier • Port Based VLANs • Alarm via email, SNMP traps • PROFINET diagnosis • DHCP Option 82 • Plugable Memory Card
Power Supply	
Nominal input voltage range	12 V ... 48 V ⎓
Permissible range	9.6 V ... 60 V ⎓
Current consumption	220 mA (at 24 V ⎓)
Diagnostics (via LED)	• Power supply in permissible range: Green • Undervoltage: Red
Terminating Power supply	5-pole pluggable screw contact, for redundant power supply
Design features	
Material of housing	Aluminium, anodized
Dimensions (W x H x D)	33 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN 60 529	IP 30
Mounting	• 35 mm top-hat rail acc. to EN 60 715 • Panel mounting, vertical assembly
Weight	approx. 0.35 kg
Environmental conditions	
Operating temperature	-40 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Relative humidity	30 % ... 95 % (non-condensing)

Ha-VIS FTS 3000

(in preparation)

Ethernet Switch
Ha-VIS FTS 3100-A

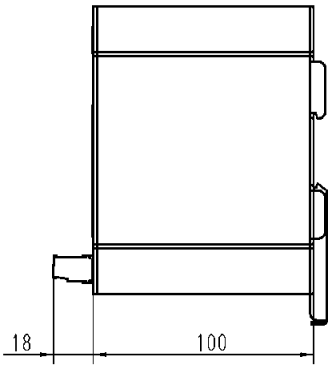
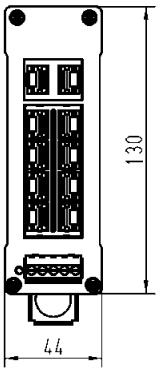
10-port Ethernet Switch with Fast Track Switching Technology
managed

Advantages

- Identification, acceleration and preference for automation frames
- Deterministic data transfer for selected profiles
- Managed Ethernet Switch acc. to IEEE 802.3
- Fast Track Switching Mode, Store and Forward Switching mode
- Robust metal housing, RoHS compliant

General Description

The Fast Ethernet Switches of the product family Ha-VIS FTS 3000 can identifiy automation profiles (e.g PROFINET, EtherNet/IP, Modbus TCP and customized profiles), accelerate their data transmission and prefer them. They are suitable for industrial applications.
The Ha-VIS FTS 3100-A enables the connection of up to 10 network devices over shielded Twisted Pair. It supports Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s).
The Ethernet Switch works as a managed switch and can work in Fast Track Switching Mode and in Store and Forward mode. It supports Auto-crossing, Auto-negotiation and Auto-polarity.

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS FTS 3100-A Ethernet Switch with 10 ports RJ45 for top-hat mounting rail	20 78 110 4000		

Technical characteristics

Features	• Auto-crossing • Auto-negotiation • Auto-polarity • Store and Forward Switching mode • Fast Track Switching mode
Ethernet Interface	
Number of ports	• 10x 10/100Base-TX, managed
Cable types acc. to IEEE 802.3	• Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	• 10/100 Mbit/s (RJ45)
Maximum cable length	• 100 m (Twisted Pair; with cable Category 5 acc. to EN 50 173-1)
Terminating method	• RJ45 (Twisted Pair)
Diagnostics (via LED)	• Status Link: Green • Status Data transfer (Act): Green flashing • Data transfer rate (Speed): 100 Mbit/s: Yellow / 10 Mbit/s: Green
Topology	• Line, Ring, Star or mixed
Basic functions	
Port settings	• 10/100 Mbit/s • Full/Half Duplex • Port enable/disable • Port mirroring • Flow Control • Industrial Profile (PROFINET, EtherNet/IP, Modbus TCP, customized) • NRT Bandwidth Control
Management functions	• STP, RSTP • IGMP Snooping with support for querier • Port Based VLANs • Alarm via email, SNMP traps • PROFINET diagnosis • DHCP Option 82 • Plugable Memory Card
Power Supply	
Nominal input voltage range	12 V ... 48 V ⎓
Permissible range	9.6 V ... 60 V ⎓
Current consumption	270 mA (at 24 V ⎓)
Diagnostics (via LED)	• Power supply in permissible range: Green • Undervoltage: Red
Terminating Power supply	5-pole pluggable screw contact, for redundant power supply
Design features	
Material of housing	Aluminium, anodized
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN 60 529	IP 30
Mounting	• 35 mm top-hat rail acc. to EN 60 715 • Panel mounting, vertical assembly
Weight	approx. 0.5 kg
Environmental conditions	
Operating temperature	0 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Relative humidity	30 % ... 95 % (non-condensing)

(in preparation)

Ethernet Switch
Ha-VIS FTS 3082-ASFP

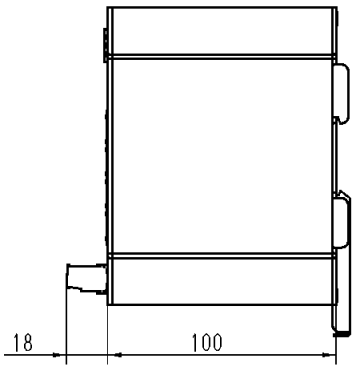
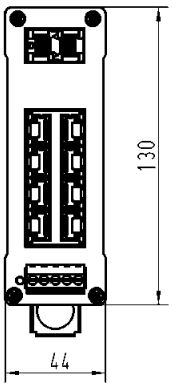
10-port Ethernet Switch with Fast Track Switching Technology, with 2 slots for SFP modules, managed

Advantages

- Identification, acceleration and preference for automation frames
- Deterministic data transfer for selected profiles
- Managed Ethernet Switch acc. to IEEE 802.3
- Fast Track Switching Mode, Store and Forward Switching mode
- Robust metal housing, RoHS compliant

General Description

The Fast Ethernet Switches of the product family Ha-VIS FTS 3000 can identifiy automation profiles (e.g PROFINET, EtherNet/IP, Modbus TCP and customized profiles), accelerate their data transmission and prefer them. They are suitable for industrial applications.
The Ha-VIS FTS 3082-ASFP enables the connection of up to 8 network devices over shielded Twisted Pair and further 2 devices via F.O. ports (depending on chosen SFP modules). It supports Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s).
The Ethernet Switch works as a managed switch and can work in Fast Track Switching Mode and in Store and Forward mode. It supports Auto-crossing, Auto-negotiation and Auto-polarity.

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS FTS 3082-ASFP Ethernet Switch with 8 ports RJ45 2 slots for SFP modules (100 Mbit/s) for top-hat mounting rail	20 78 110 4300		

Technical characteristics

Features	• Auto-crossing • Auto-negotiation • Auto-polarity • Store and Forward Switching mode • Fast Track Switching mode
Ethernet Interface	
Number of ports	• 8x 10/100Base-TX, managed • 2x slots for SFP modules 100Base-FX, managed
Cable types acc. to IEEE 802.3	• Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	• 10/100 Mbit/s (RJ45) / 100 Mbit/s (F.O.)
Maximum cable length	• 100 m (Twisted Pair; with cable Category 5 acc. to EN 50 173-1)
Terminating method	• RJ45 (Twisted Pair) / SFP modules
Diagnostics (via LED)	• Status Link: Green • Status Data transfer (Act): Green flashing • Data transfer rate (Speed): 100 Mbit/s: Yellow / 10 Mbit/s: Green
Topology	• Line, Ring, Star or mixed
Basic functions	
Port settings	• 10/100 Mbit/s • Full/Half Duplex • Port enable/disable • Port mirroring • Flow Control • Industrial Profile (PROFINET, EtherNet/IP, Modbus TCP, customized) • NRT Bandwidth Control
Management functions	• STP, RSTP • IGMP Snooping with support for querier • Port Based VLANs • Alarm via email, SNMP traps • PROFINET diagnosis • DHCP Option 82 • Plugable Memory Card
Power Supply	
Nominal input voltage range	12 V ... 48 V ⎓
Permissible range	9.6 V ... 60 V ⎓
Current consumption	270 mA (at 24 V ⎓)
Diagnostics (via LED)	• Power supply in permissible range: Green • Undervoltage: Red
Terminating Power supply	5-pole pluggable screw contact, for redundant power supply
Design features	
Material of housing	Aluminium, anodized
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN 60 529	IP 30
Mounting	• 35 mm top-hat rail acc. to EN 60 715 • Panel mounting, vertical assembly
Weight	approx. 0.5 kg
Environmental conditions	
Operating temperature	0 °C ... +60 °C
Storage temperature	-40 °C ... +85 °C
Relative humidity	30 % ... 95 % (non-condensing)

Management functions

Basic Functions		
	Store and Forward Switching Mode	IEEE 802.3
	Manual and Dynamic IP Address Assignment	
Port-Settings	Auto-negotiation on / off	
	Port Speed 10 Mbit/s / 100 Mbit/s	
	Half / Full duplex	
	Port disable / enable	
	Link Up/Down Trap disable / enable	
	Flow Control disable / enable	
Network Discovery	Link Layer Discovery Protocol (LLDP)	802.1AB, 2005
Rate Control	Rate Control per port (Broadcast, Multicast, Unicast)	
File Transfer	Firmware import and export via TFTP and HTTP	
	Configuration import and export via TFTP and HTTP	
Time Settings	Manual time setting	
	Simple Network Time Protocol (SNTP)	RFC 1305, RFC 4330
User Management	Admin, Guest and Service Level	
Service	Service Mode via port 1	
PROFINET		
	PROFINET IO Device Stack	
QoS		
	Quality of Service (QoS)	IEEE 802.1p
	Differentiated services (DiffServ)	RFC 2474, 2475
VLAN		
	Port protocol based VLANs VLAN ID Range: 1 – 4094 Max. Anzahl aktiver VLANs: 256	IEEE 802.1Q Rev D5.0, 2005
Redundancy		
	Spanning Tree (STP)	IEEE 802.1D (2004)
	Rapid Spanning Tree (RSTP)	IEEE 802.1D (2004)
	Media redundancy protocol *	DIN EN 62 439-2
Security		
	Port-Based Network Access Control Port Based Authentication with EAP	802.1X (2004)
	RADIUS Client	RFC 2138
	IP authorized manager	
Link Aggregation		
	Link Aggregation (LACP)	IEEE 802.3ad (2005)
Multicast		
	IGMP Snooping (v1, v2, v3) with support for querier	RFC 1112, 2236, 3376
DHCP		
	DHCP Client	RFC 2131
	DHCP relay agent	RFC 2131
	DHCP Option 82	RFC 3046

Management functions

Alarm		
	Alarms via E-mail (SMTP) and SNMP Traps	
	Signalling contact for low voltage detection or Link break	
Diagnostic		
	Port diagnostic	
	Port Mirroring	
	Switch History	
	MAC Address Table	
	RMON (1,2,3 & 9 groups)	RFC 2819
Management		
	Password protected Web-Management interface	
	SNMP (v1, v2c, v3) agent & MIB support	RFC 1155, 1157, 1212, 1213, 1215, 2089, 2578, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3584
	Pluggable SD card for saving of configuration	
	Multifunction button	

* ... Licensing via separately available SD card

Ha-VIS mCon 3000 Next Generation – Introduction and features

Ethernet Switch
Ha-VIS mCon 3000 Next Generation
Ethernet Switches, managed,
for mounting onto top-hat mounting rail
in control cabinets

General Description

The fully Managed Ethernet Switches of the product family Ha-VIS mCon 3000 enable the connection of up to 10 network devices (according to type) over RJ45 ports or SFP modules on lowest area.

Degree of protection, mechanical stability and the comprehensive management software provide for high operation safety and meet highest demands.

The Ha-VIS mCon 3000 Ethernet Switches are designed for an effective, industrial and individual use.

The configuraton via SD card or via the Multifunction button enables an easy and fast commisioning in the field.

Comprehensive possibilities of configuration and diagnostic are provided easy via web interface or standardized via SNMP.

The Ethernet Switches of the Ha-VIS mCon 3000 Next Generation family can be used as PROFINET IO devices.

Features

- Full managed Ethernet Switch acc. to IEEE 802.3
- Up to 10 ports, managed, non-blocking
- Store and Forward Switching Mode
- Gigabit Uplink ports, RJ45 and SFP modules
- Auto-crossing, Auto-negotiation, Auto-polarity
- Temperature range -40 °C ... +70 °C
- PROFINET IO device
- Multifunction button for fast commsioning
- SD card slot for storage of the configuration
- Management functions see page 128

Advantages

- Small, robust metal housing
- External SD card for storage of the configuration
- Individual pre-configuration via Multifunction button
- Fast removable Ethernet data links via SFP „Hot-Swap“
- Optimised DIN rail fitting
- EMC, temperature range and mechanical stability meet the highest demands

Application fields

- Industrial automation
- Automotive industry
- Wind power, Solar Power
- Maritime

Technical characteristics

Ethernet interface RJ45

Number of ports	
Ha-VIS mCon 3080-A	8x 10/100Base-T(X)
Ha-VIS mCon 3102-AASFP	8x 10/100Base-T(X) 2x 10/100/1000Base-T(X) (Combo ports with SFP slot)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s, 100 Mbit/s or 1000 Mbit/s (RJ45)
Maximum cable length	100 m (Twisted Pair; with Category 5 cable acc. to DIN EN 50 173-1)
Termination	RJ45 (Twisted Pair)
Diagnostics (via LED)	• Status Link – Green • Data transfer (Act) – Green flashing • Data transfer rate (Speed) – 1000 Mbit/s: Green 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	Ring, Line, Star or mixed

Ethernet Interface SFP (mini-GBIC) Fibre Optic and copper

Number of ports	
Ha-VIS mCon 3102-AASFP	2x 100/1000Base (Combo ports with SFP slot)
Data rate	100 Mbit/s, 1000 Mbit/s
Termination	SFP modules according to MSA (Multi Source Agreement) (see catalogue „HARTING Ethernet Network Solutions Automation IT“)
Diagnostics	Digital Diagnostics Monitoring (DDM) according to SFF-8472 (available with software release 2.4 or higher)
Diagnostics (via LED)	• Status Link – Green • Data transfer (Act) – Green flashing

Power supply

Nominal input voltage	24 V ⎓
Termination	5-pole screw terminal, pluggable for redundant power supply

Switch

Diagnostics (via LED)	• Devive operates without failures – Green • Power supply in the admissible range – Green • Low voltage – Red • Diagnostics failure – Red • PROFINET failure / diagnosis – Red/Green flashing
Configuration	
Slot for SD cards (back side)	Saving and loading of configuration files
Multifunction button	Individual pre-configuration of software functions

Technical characteristics

Design features

Housing material	Aluminium, anodized
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN 60529	IP 30
Mounting	• 35 mm top-hat rail acc. to EN 60715 • Panel mounting, vertical assembly

Environmental conditions

Operating temperature	–40 °C … +70 °C
Storage temperature	–40 °C … +85 °C
Relative humidity	10 % … 95 % (non-condensing)

Management software

Full managed via web interface and SNMP

Range of functions and detailed description see page 128

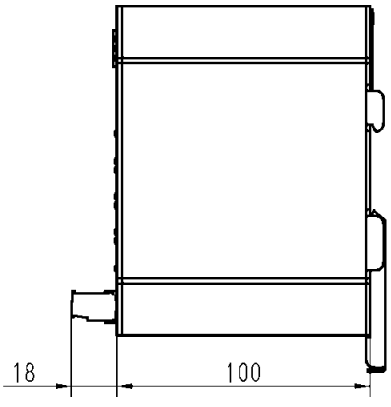
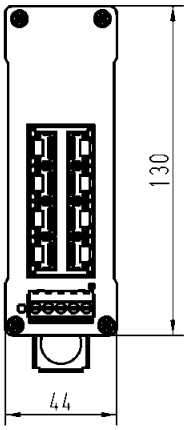
Ha-VIS mCon 3080-A

Ethernet Switch
Ha-VIS mCon 3080-A

8-port Ethernet Switch, full managed
for mounting onto top-hat mounting rail in control cabinets

Managed	IP 30	PROFINET compatible [X]	EtherNet/IP compatible [X]

Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair)
Nominal input voltage range	12 V ... 48 V ⎓
Permissible range (min/max)	9.6 V … 60 V ⎓
Termination	5-pole screw terminal, pluggable redundant power supply
Input current	approx. 130 mA (at 24 V ⎓)
Housing material	Aluminium, anodized
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
Weight	approx. 0.450 kg
Operating temperature	–40 °C … +70 °C
Approvals (in preparation)	UL 508; UL 60 950-1; DNV
Management	fully Managed via Web interface and SNMP Functions see page 128

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3080-A Ethernet Switch, full managed 8 RJ45 ports including Set for assembly on standard rail	20 76 108 4000		

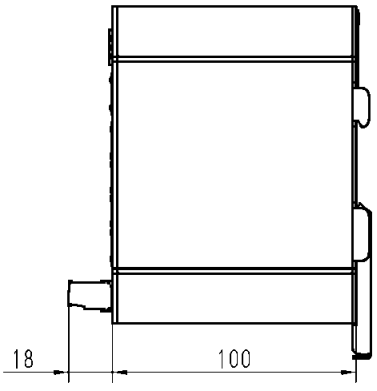
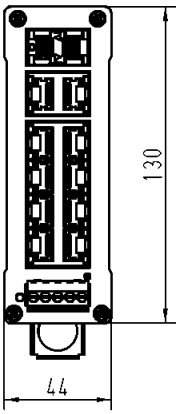
Ha-VIS mCon 3102-AASFP

Ethernet Switch
Ha-VIS mCon 3102-AASFP

10-port Ethernet Switch with 2 ports Gigabit Ethernet, full managed
for mounting onto top-hat mounting rail in control cabinets

Managed	IP 30	PROFINET compatible [X]	EtherNet/IP compatible [X]

Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair) 2x 10/100/1000Base-T(X) / RJ45 (Twisted Pair)
Number of slots SFP / Termination	2x 100/1000Base / Combo ports
Nominal input voltage range	12 V ... 48 V ⎓
Permissible range (min/max)	9.6 V … 60 V ⎓
Termination	5-pole screw terminal, pluggable redundant power supply
Input current	approx. 250 mA (at 24 V ⎓)
Housing material	Aluminium, eloxiert
Dimensions (W x H x D)	44 x 130 x 100 mm (incl. cap, without connectors)
Weight	approx. 0.485 kg
Operating temperature	–40 °C … +70 °C
Approvals (in preparation)	UL 508; UL 60 950-1; DNV
Management	fully Managed via Web interface and SNMP Functions see page 128

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3102-AASFP Ethernet Switch, full managed 8 ports Fast Ethernet RJ45 2 ports Gigabit Ethernet (combo SFP) including Set for assembly on standard rail	20 76 112 4300		

Ha-VIS Memory Cards

Accessories
Ha-VIS Memory cards

The HARTING SD cards are used for saving the switch configuration. The web interface can be used to save the current configuration to the SD card.

If an SD card is inserted in the back of the switch, the switch will use the configuration saved on the card when it boots.

So it‘s quite easy when replacing a switch to transfer the entire configuration to the new switch. The old SD card with your current configuration is simply pushed into the new switch which then boots with these settings. No special network expertise is required.

Note: The HARTING Ethernet Switches are not compatible with conventional memory cards.

MRP memory cards allow you to activate the MRP functionality (media redundancy protocol) when using switches from the FTS 3000 and mCon 3000 series (with firmware ver. 3.0.0.1 and later). For example, in order to operate the device as an MRP slave, you need only have the corresponding MRP slave card inserted during operations.

Operating temperature	-40 °C ... +70 °C
Memory space	128 MB

Identification	Part number	Drawing	Dimensions in mm
SD Memory cards			
Configuration memory	20 89 900 1000		
MRP Slave	20 89 900 1001		
MRP Master	20 89 900 1002		

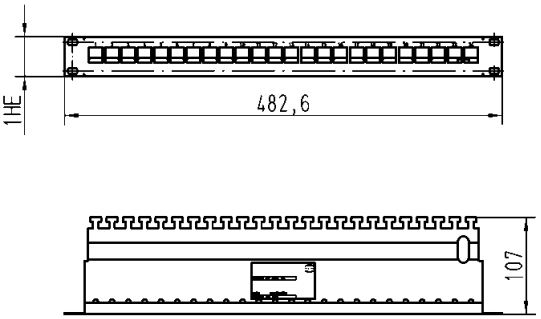
Ha-VIS preLink®
19“ Patch panel, Keystone

Advantages

- Suitable for Ha-VIS preLink® RJ45 module in Keystone size
- Economic due to easy design
- Safety, additional strain-relief, fully shielded modules connected through metal holding fixture, earth bolt
- Future proof, Cat 6 Class E_A 500 MHz transmission performance, transmission rate up to 10 Gbit/s

Applications

- Structured cabling for industrial premises
- IP 20 installation for distributors and switch cabinets
- Assembly in 19“ racks acc. to IEC/DIN EN 60 297-3-100 (DIN 41 494-1)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS preLink® 19“ patch panel, Keystone Number of modules: 24 Module design: Keystone size acc. to EN 60 603-7:2009 Dimensions: 19“, 1 U, depth 107 mm Design: sheet steel, coated RAL 7035 (light grey) Range of delivery: 24 pieces of Ha-VIS preLink® RJ45 Keystone jack, terminal modules for AWG 22 / 23 and strain relief	20 82 405 0001		

HARTING PROFINET Type C Torsional Stress Cable 4-wire Cat. 5 PUR

PROFINET Type C Torsional cable 4-wire, Cat. 5, PUR

Advantages

- Suitable for PROFINET cabling Category 5 / Class D according to ISO/IEC 11 801 respectively EN 50 173 and ISO/IEC 24 702 respectively EN 50 173-3
- Applicable for industrial premises
- Applicable for torsional stress
- RoHS conform, UL recognized, flame retardant, halogen free

General

This data cable is suitable for PROFINET cabling according to type C torsional stress in industrial premises and areas. It is usable for flexible cords especially e.g. for industrial robot application. The core is fitted with 4 wires twisted to quad that allows the transmission of Fast Ethernet 10/100Mbit/s.
Can be assembled with all HARTING 4-pole RJ45 connectors.

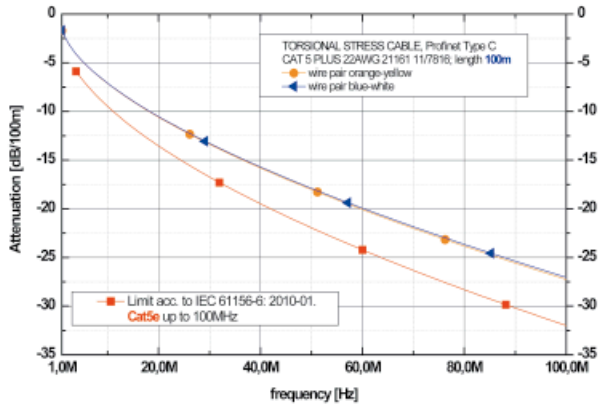
Identification	Part number	Drawing
PROFINET Type C Torsional cable 4-wire, Cat. 5, PUR		
		• Wire: Stranded tinned copper AWG 22/19 • Foamed: : PE Ø1.52 mm (+/- 0.03) • Plastic Tape, overlapped • Overall screen: tinned copper wire braid, braid coverage about 85 % • Outer sheath: Polyurethane (PUR), flame retardant
20 m ring	09 45 600 1110	Color code: wh, ye, bu, or Color of outer sheath: green, RAL 6018 Overall diameter: 6.3 mm ... 6.7 mm
50 m ring	09 45 600 1120	
100 m ring	09 45 600 1130	
500 m reel	09 45 600 1140	

Technical Characteristics

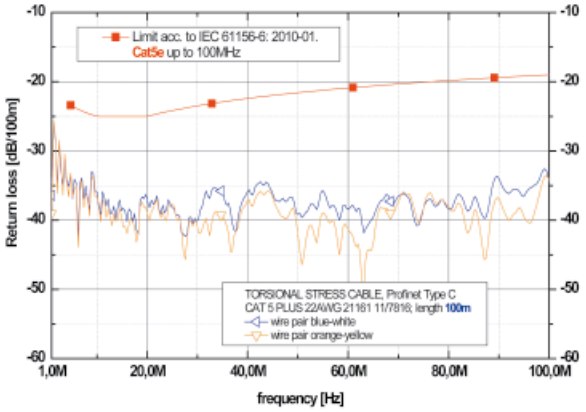
Performance	Category 5 according to EN 50 288-2-2:2003, IEC 61 156-6:2002
Mechanical Characteristics	
Minimal bending radius	Single bending: 5 x diameter max. 150 N
Torsional strength	+/-180° on 1 m, 1 Mil. cycles
Electrical Characteristics at 20 °C	
Conductor resistance	max. 120 Ohm/km
Insulation resistance	min. 500 MOhm*km
Velocity of propagation	4,7 ns/m
Characteristic impedance at 100 MHz	100 Ohm +/- 15 Ohm
Test voltage (wire/wire/screen rms 50 Hz 1 min)	700 V
Chemical Characteristics	
Halogen free	
Flame retardant	IEC 60 332-1-2
UL-Style 21161 (80 °C)	
Thermal Characteristics	
Permissible temperature range	-40 °C ... +80 °C
Printing	HARTING INDUSTRIAL ETHERNET TORSIONAL STRESS CABLE CAT 5 PLUS * 22AWG * E 333435 AWM STYLE 21161 80°C * 094560001010300 „sequential length in meters“ * „year/internal order number“ „HARTING-LOGO“
Weight about	54 kg/km

Technical Characteristics, Transmission performance

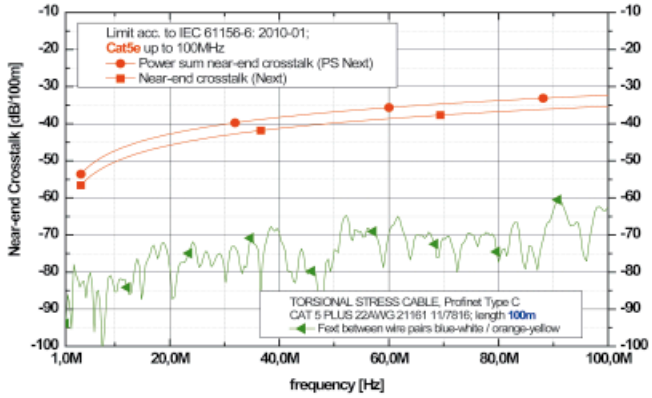
Attenuation



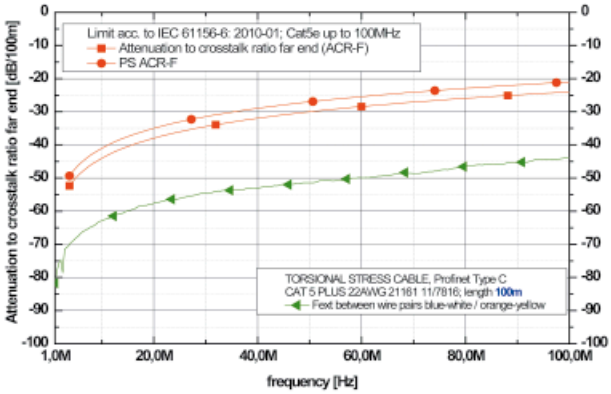
Return loss



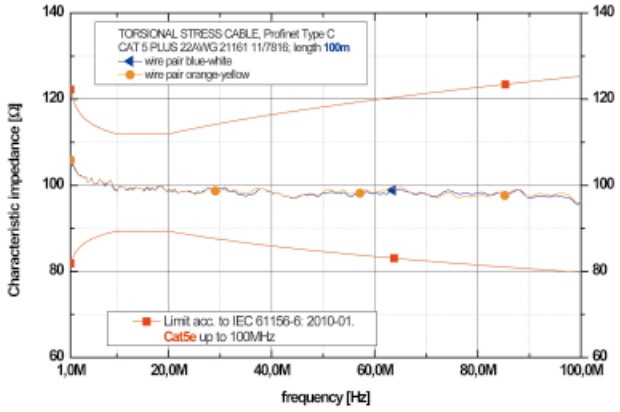
NEXT



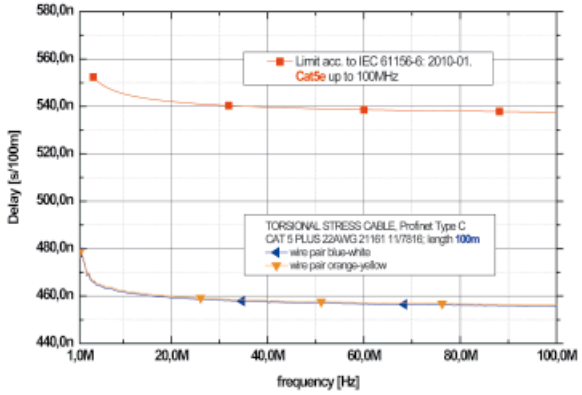
Attenuation to Crosstalk Radio fa-end (ACR)



Characteristic Impedance



Propagation Delay



Available by 3rd quarter 2012

Ha-VIS RFID Handheld RF-M3000
mobile Long Range Reader

Advantages

- Robust
- Flexible
- For industrial applications

General Description

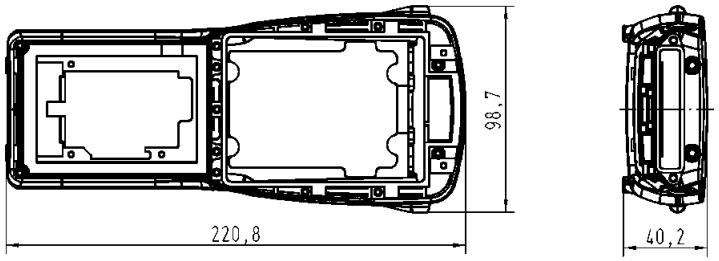
The Ha-VIS RF-M3000 is a powerful mobile Long Range Reader approved acc. to ETSI, FCC und IC.

Properties:
- Highly sensitive receiver for extended reading range
- Robuste housing
- High protection class IP 65
- WLAN, Bluetooth and RFID in one handheld
- Large, very bright display
- Very long battery life
- Highly modular

Identification	Part number
Ha-VIS RFID Handheld RF-M3000 (no barcode scanner)	20 91 211 1011
Ha-VIS RFID Handheld RF-M3001 1D Laser Scanner	20 91 211 1111
Ha-VIS RFID Handheld RF-M3002 2D Imager	20 91 211 1311
Recommended accessories:	
High capacity battery	20 93 405 0101
Docking Station Desktop	20 93 305 0101
Docking Station Quad	20 93 305 0102

Drawing

Dimensions in mm



Technical characteristics

Processor and memory	PXA270 624 MHz Processor 1 GB FLASH ROM 256 MB RAM
Operating system	Windows(R) CE 5
Wireless communikation	WLAN 802.11 b/g Compact Flash Bluetooth ® Class II, V 2.0 + EDR
Barcode scanner	1D Laser Scanner Long Range or 2D Area Imager Optional pistol grip
RFID module	UHF module Frequency 868 MHz or 915 MHz Tag supported: EPC Class 1 Gen 2; other protocols on depending on region Reading-Writing distance up to 250 cm
External connections	Tether-Port for RS 232 and USB On-The-Go (USB 1.1) Docking-connector DC power jack
User interface	VGA colour touchscreen 3,6“, resolution 480x640, TFT Sunlight readable (for outdoor use), highly reliable LED backlight Touch screen pencil (stylus) or finger operation Keyboard (alphanumeric ABCDEF); alternatives on request Audio: 90 dB speaker, microfon, beeper
Programming environment	HTML, XML Mobile Devices SDK .NET and C++ via Microsoft Visual Studio® 2005 Java progamming support JDK 1.2. or higher Standard Protocol APIs Windows sockets (CE.net)
Expansion slots	SD/MMC memory card slot End-cap USB interface supports GPS expansion module 100-pin Expansion interface supports PCMCIA (Type II), GPRS/EDGE One Type II CF card slot
Power management	4400 mAh High capacity Accu (3,7 V) Advanced Smart Battery System Built-in Charger
Environmental	Withstands several drops from 1,8 m to polished concrete while powered on and configured with accessories Rain/Dust: IP 65, IEC 60 629 Operating temperature: -20 °C ... +50 °C Storage temperature: -40 °C ... +60 °C Relative humidity: 5 % ... 95 % (non-condensing) ESD +/- 8 kV DC air discharge; +/- 4 kV DC contact
Dimensions (W x H x D)	223 mm x 75/100 mm x 31/42 mm
Approvals	Safety CSA/UL60950-1, IEC 60950-1, EN 60950-1 EMC FCC Part15 Class B EN 55022; EN 55024; EN 301 489 Laser IEC 60825-1, Class 2 FDA 21 CFR 1040.10, 1040.11 Class II Bluetooth 1.2 In-vehicle cradle: e Mark

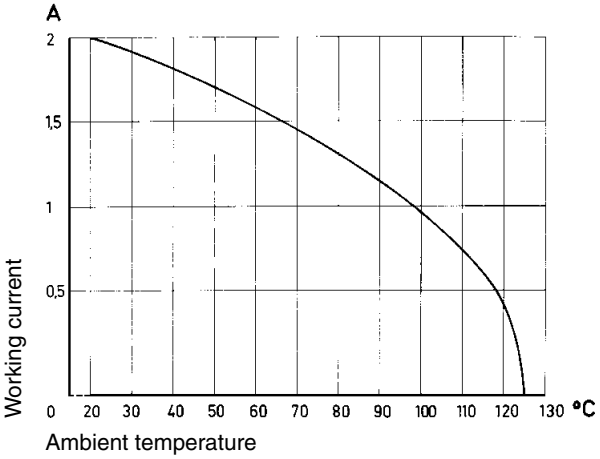
Notes

Number of contacts	max. 30
Contact spacing (mm)	2.54
Working current see current carrying capacity chart	2 A max.
Clearance	≥ 1.2 mm
Creepage	≥ 1.2 mm
Working voltage The working voltage also depends on the clearance and creepage dimensions of the pcb itself, and the associated wiring	according to the safety regulations of the equipment
Test voltage $U_{r.m.s.}$	1 kV
Contact resistance	≤ 20 mΩ
Insulation resistance	≥ 10^{12} Ω
Temperature range The higher temperature limit includes the local ambient and heating effects of the contacts under load	– 55 °C … + 125 °C
Degree of protection for crimp terminal according to DIN 40 050	IP 20
Electrical termination	Crimp terminal 0.09-0.5 mm²
Insertion and withdrawal force	16way ≤ 15 N 20way ≤ 20 N 30way ≤ 30 N
Materials	
Mouldings	Thermoplastic resin, glass-fibre filled, UL 94-V0
Contacts	Copper alloy
Contact surface	
Contact zone	Selectively plated according to performance level

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

Control and test procedures according to DIN IEC 60 512

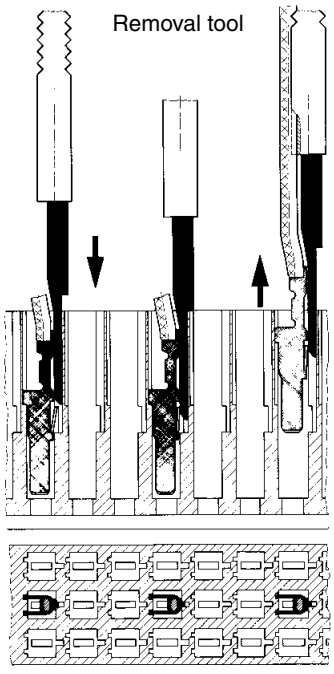


Fitting the crimp contacts

After crimping the wires onto the contacts with the help of a crimping tool or an automatic crimping machine the contacts should be correctly oriented and inserted into the cavities of the connector moulding in the required configuration. They snap into position and are firmly held in place. A light pull on the wire assures the correct tensile strength of the contact. When using stranded wires with a gauge below 0.37 mm² an insertion tool is necessary.

Removing the crimp contacts

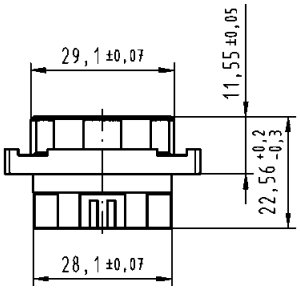
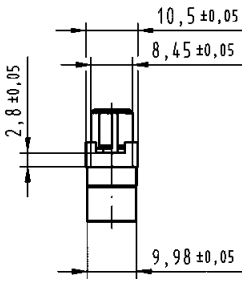
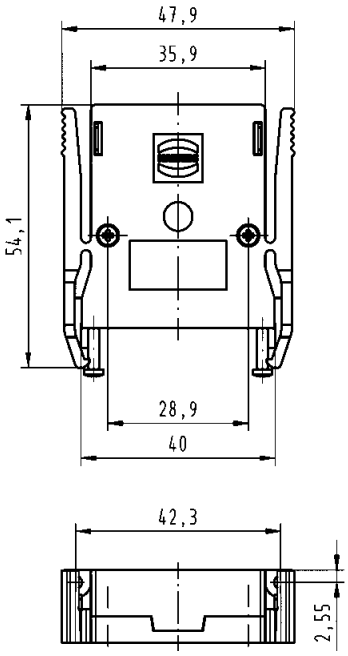
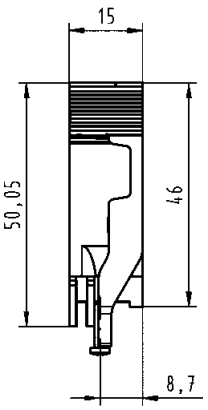
The removal tool is inserted into a slot on the side of the respective crimp cavity. This action compresses the contact retaining spring therefore the contact can then be easily withdrawn using a light pull on the wire. This action will cause no damage to the contact/wire which can be repositioned/refitted as necessary. The drawing demonstrates the crimp removal procedure (max. 5x).



Number of contacts

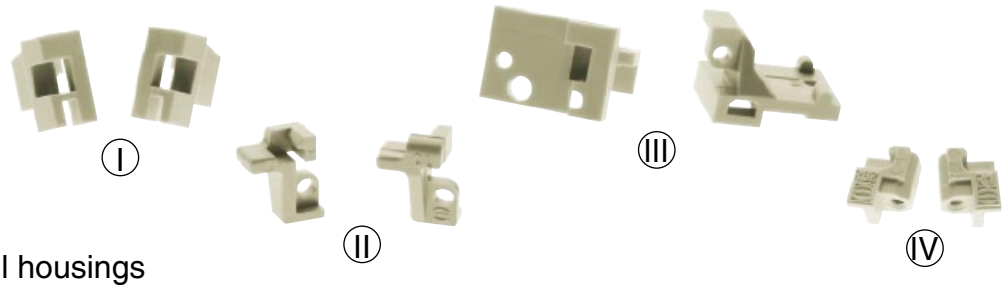
max. 30

Female connectors and shell housings

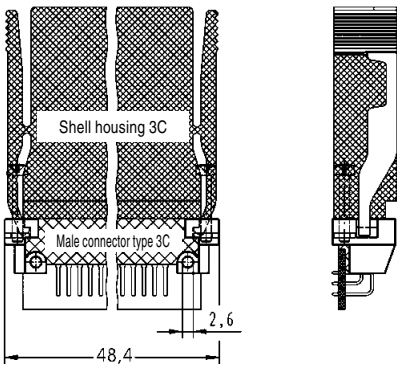
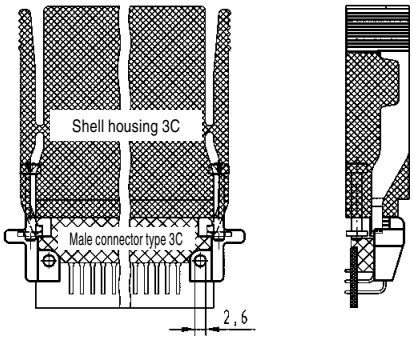
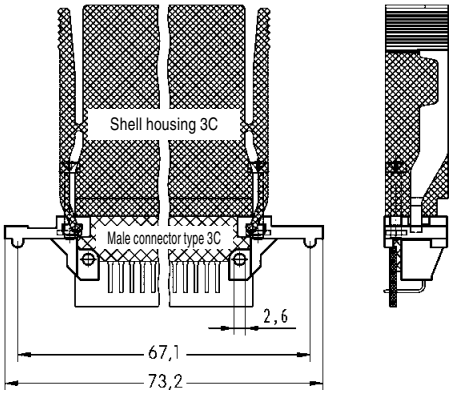
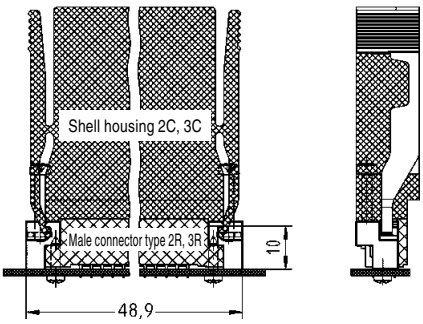
Identification	Number of contacts	Part No.	Drawing	Dimensions in mm
Female connector for crimp contacts Order contacts separately	30	09 25 030 3214[f)]		
Shell housing 3C for female connectors type 3C Supplied with: Shell 1x Cover with 2 locking levers 1x Cable tie 1x Screw 2.2 x 9.5 4x (09 06 001 9974)		09 25 030 0501		

Identification	Part No. 2	Performance levels according to IEC 60603-2. 1
Female crimp contacts BC		
Bandoliered contacts (approx. 5 ,000 pieces)	09 02 000 6484	09 02 000 6474
Bandoliered contacts (approx. 500 pieces)	09 02 000 8434	09 02 000 8444
Individual contacts[1)]	09 02 000 8484	09 02 000 8474

[1)] Packaging unit 1,000 pieces
[f)] Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2



Accessories for shell housings

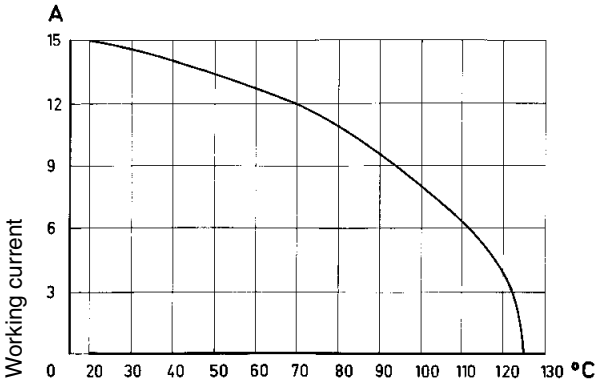
Identification	Part No.	Drawing	Dimensions in mm
Fixing brackets C for angled male connectors on pcb without fixing possibility in 19" racks Ⓘ	left 09 02 000 9926 right 09 02 000 9927		
Fixing brackets C for male connectors for 19“ racks according to DIN EN 60 297, part 3-101 Multiple fixing Ⓘⓘ	left 09 02 000 9919 right 09 02 000 9920		
Single fixing Ⓘⓘⓘ	left 09 02 000 9921 right 09 02 000 9922		
Fixing brackets R for inverse male connectors on pcb's Ⓘⓥ	R 1 09 02 000 9953 R 32 09 02 000 9954		

Number of contacts	15
Working current see current carrying capacity chart	15 A max.
Clearance	≥ 4.5 mm
Creepage	≥ 8.0 mm
Working voltage The working voltage also depends on the clearance and creepage dimensions of the pcb itself and the associated wiring	according to the safety regulations of the equipment Connectors should not be mated under voltage
Test voltage $U_{r.m.s.}$	≥ 3.1 kV
Contact resistance	≤ 8 mΩ
Insulation resistance	≥ 10^{12} Ω for standard articles ≥ 10^{11} Ω for special NFF articles (with part-no. ending 222)
Temperature range The higher temperature limit includes the local ambient and heating effects of the contacts under load	– 55 °C … + 125 °C
Insertion and withdrawal force	≤ 90 N
Materials	
Mouldings	Thermoplastic resin, glass-fibre filled, UL 94-V0
Contacts	Copper alloy
Contact surface	
Contact zone	Hard silver plated

Current carrying capacity

The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the maximum temperature.

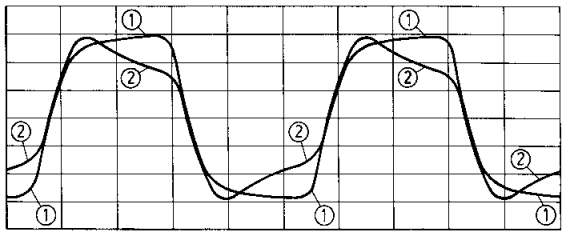
Control and test procedures according to DIN IEC 60 512



Ambient temperature

Low currents and voltages

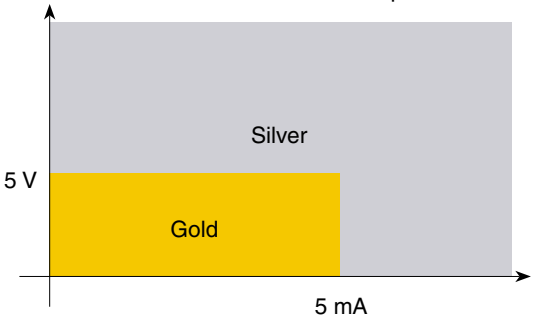
Type H standard contacts have a silver plated surface. This precious metal has excellent conductive properties. In the course of a contact's lifetime, the silver surface generates a black oxide layer due to its affinity to sulphur. This layer is smooth and very thin and is partly interrupted when the contacts are mated and unmated, thus guaranteeing very low contact resistances. In the case of very low currents or voltages small changes to the transmitted signal may be encountered. This is illustrated below where an artifically aged contact representing a twenty year life is compared with a new contact.



Changes to the transmitted signal after artifical ageing
① new contact ② after ageing

In systems where such a change to the transmitted signal could lead to faulty functions and also in extremely aggressive environments, HARTING recommend the use of gold plated contacts.

Below is a table derived from actual experiences.

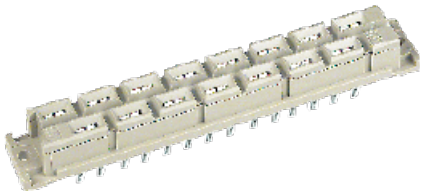


Recommendation

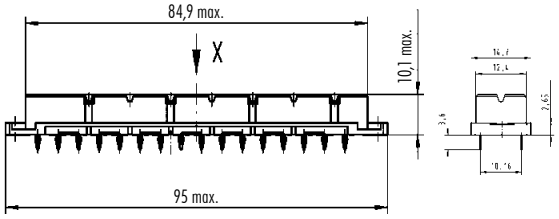
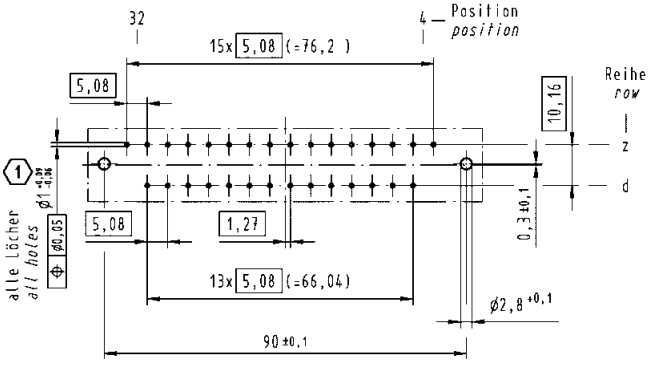
Number of contacts

15

available Q3 / 2012

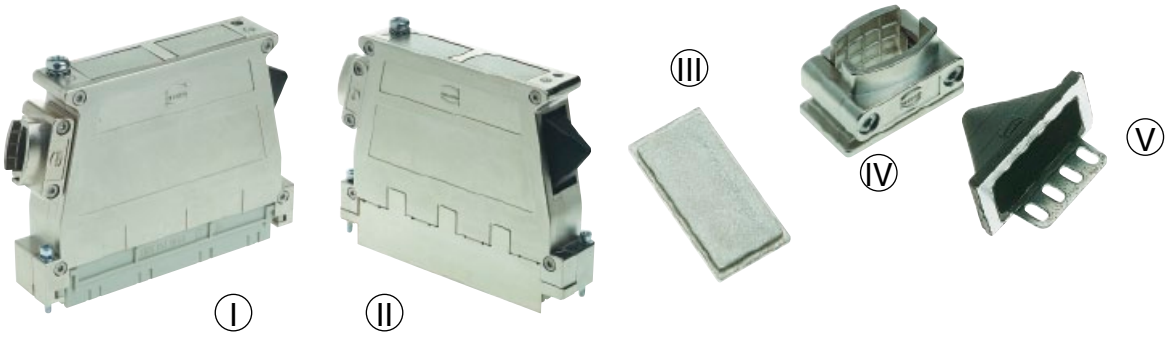


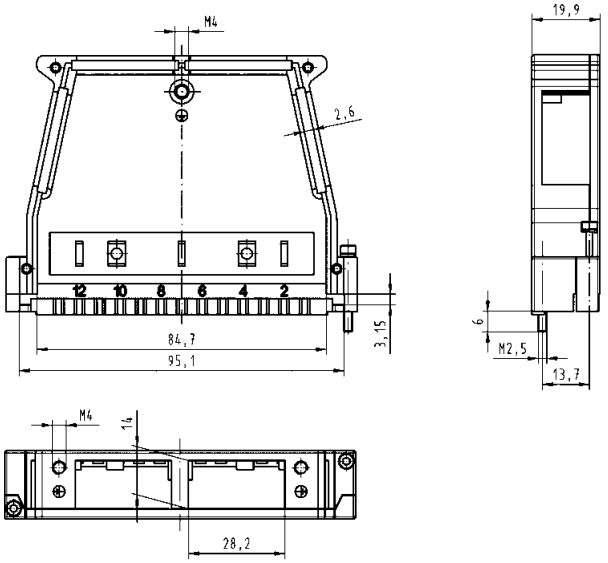
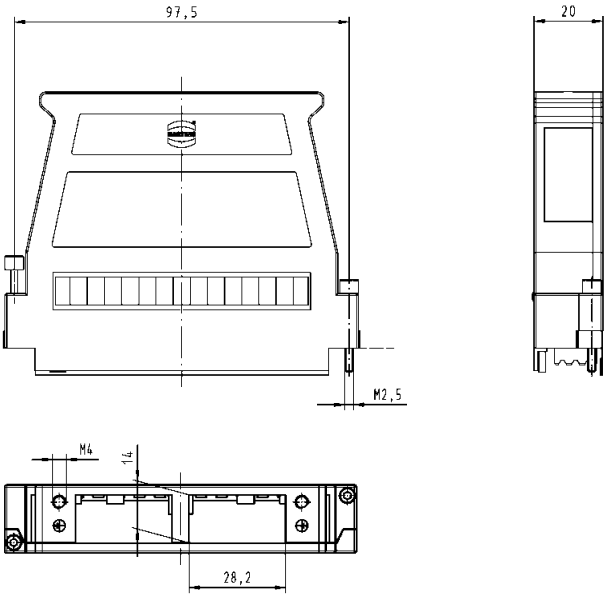
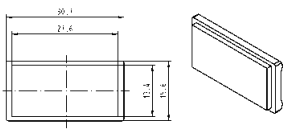
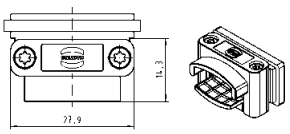
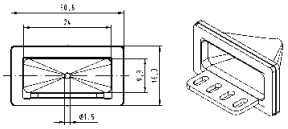
Female connectors

Identification	Number of contacts	Part No.	Drawing	Dimensions in mm
Female connector “low profile“ with press-in pins 3.6 mm		Performance level 1 acc. to IEC 60 603-2		
Position separation termination side 5.08 mm	15	09 06 215 2854 09 06 215 2854 222[f]		
Board drillings Mounting side				

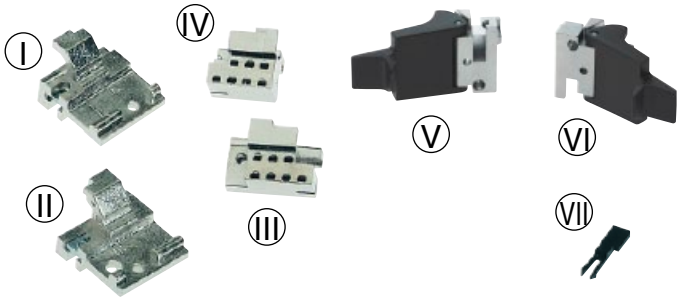
[f] Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

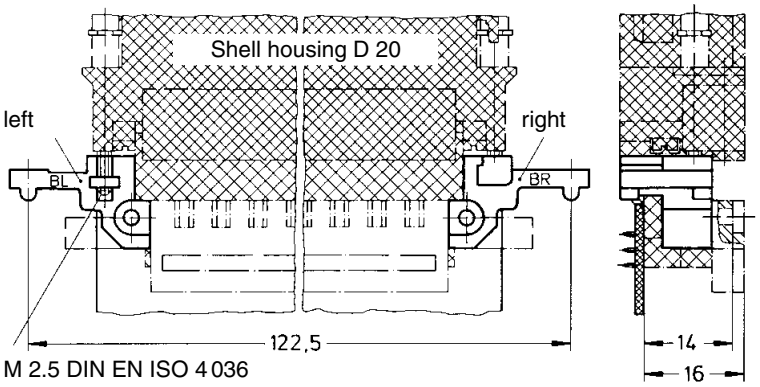
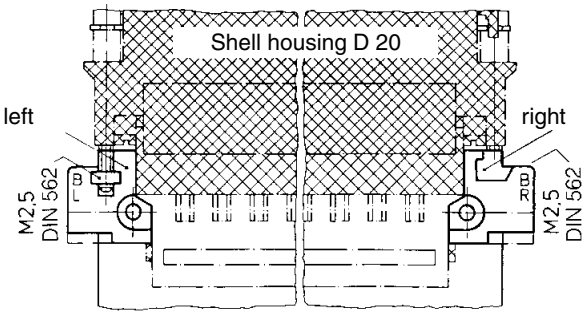
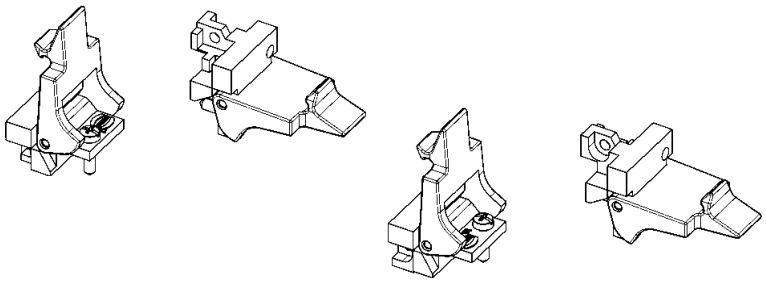
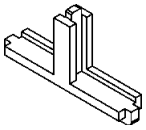
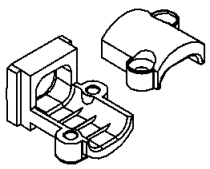
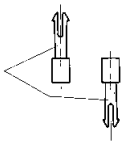
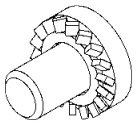
DIN 41612 · Shell housing D 20 metal



Identification	Part No.	Drawing	Dimensions in mm
Shell housing D 20 metal (I) Supplied with: Shell with coding 1x Cover 1x Locking screw (hexagonal) M2.5 x 22 (09 06 800 9953) 2x Screw (torx) M2.5 x 10 (09 06 800 9960) 4x Earth screw M4 x 8 (09 06 800 9958) 2x	09 06 848 0550		
Shell housing D 20 metal HF with nickel-plated surface (II) Supplied with: Shell with coding and HF-sealing spring 1x Cover with shielding plate 1x Locking screw (hexagonal) M2.5 x 22 (09 06 800 9953) 2x Screw (torx) M2.5 x 10 (09 06 800 9960) 4x Earth screw M4 x 8 (09 06 800 9958) 2x	09 06 848 0551		
Blinding piece (III)	09 06 800 9951		
Cable clamp (IV)	09 06 800 9955		
Cable grommet with strain relief (V)	09 06 800 9950		

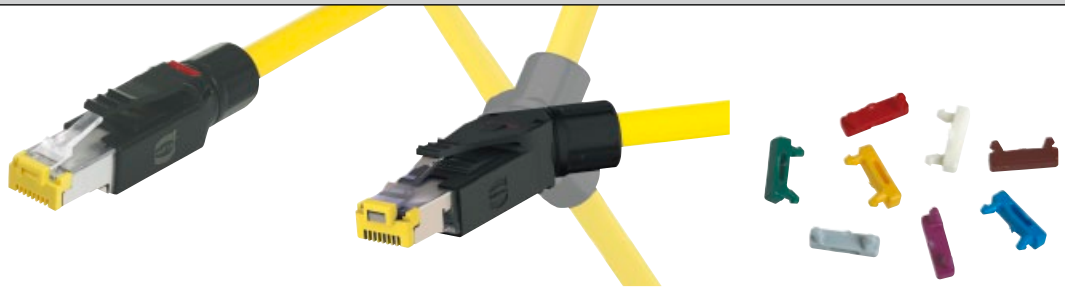
DIN 41 612 · Shell housing D 20 metal



Identification	Part No.	Drawing	Dimensions in mm
Fixing brackets B metallised for male connectors for 19" racks according to DIN EN 60 297, part 3-101 (I) **Single fixing** with nut M 2.5 DIN EN ISO 4 036 (II)	left 20 mm 09 06 901 9924[f)] right 20 mm 09 06 901 9925[f)]		
Multiple fixing with coding at fixing bracket with nut M 2.5 DIN 562 (III) (IV)	left 20 mm 09 06 900 9997[f)] right 15 mm 09 06 900 9996[f)]		
Fixing brackets B metal for male connectors for 19" racks according to DIN EN 60 297, part 3-101 (V) **Single fixing** with ejector handle (VI)	left 09 06 800 9946 right 09 06 800 9948		
Crimp flange insert	09 06 800 9952		
Cable clamp			
cable-Ø appr. 5- 7 mm	61 03 000 0141		
cable-Ø appr. 7-10 mm	61 03 000 0044		
cable-Ø appr. 10-12 mm	61 03 000 0143		
Blanking piece for hoods	61 03 000 0042		
Code pin (VII)	09 06 001 9905	 Order 13 pieces per code comb	
Earth screw M4 x 8	09 06 800 9958		

[f)] Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

HARTING RJ Industrial® 10G



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

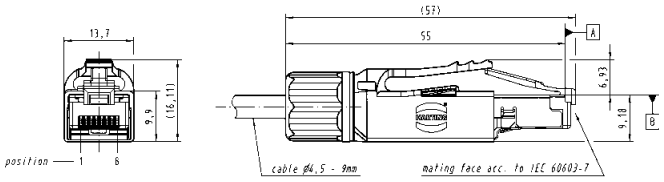
Advantages

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

Technical characteristics

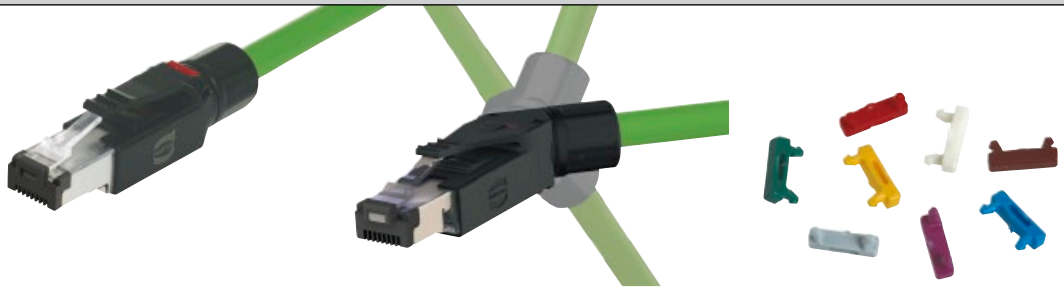
Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	8
Transmission category	Category 6, class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 … AWG 22 (solid / stranded)
- Conductor diameter	max. 1.6 mm (incl. insulation)
- Cable diameter	4.5 ... 9 mm (straight version) 4.5 up to 8 mm (45° angled version)
Mating cycles	min. 750
Degree of protection	IP 20
Temperature range	-40 °C … +70 °C
Housing material	Polyamide, UL 94-V0
Colour	black

Identification	Part No.	Drawing	Dimensions in mm
HARTING RJ Industrial® 10G connector set RJ45, 8-poles			
straight version	09 45 151 1560		
45° angled version (four different cable outlets possible)	09 45 151 1561		



Identification	Colour	Part No.
Colour clips for colour coding the HARTING RJ Industrial® 10G connector If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.	White	09 45 850 0001
	Grey	09 45 850 0002
	Yellow	09 45 850 0003
	Magenta	09 45 850 0005
	Red	09 45 850 0007
	Blue	09 45 850 0008
	Green	09 45 850 0009
	Brown	09 45 850 0010

HARTING RJ Industrial®



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

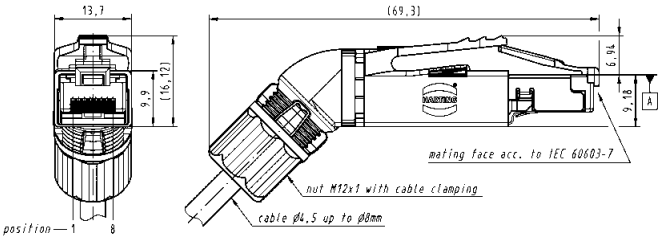
Advantages

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

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	4
Transmission category	Category 5, class D, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 … AWG 22 (solid / stranded)
- Conductor diameter	max. 1.6 mm (incl. insulation)
- Cable diameter	4.5 ... 9 mm (straight version) 4.5 up to 8 mm (45° angled version)
Mating cycles	min. 750
Degree of protection	IP 20
Temperature range	-40 °C … +70 °C
Housing material	Polyamide, UL 94-V0
Colour	black

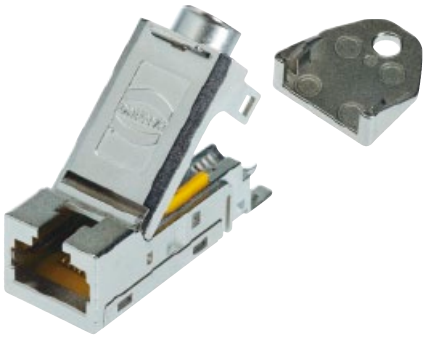
Identification	Part No.	Drawing	Dimensions in mm
HARTING RJ Industrial® PN connector set RJ45, 4-poles			
straight version	09 45 151 1120		
45° angled version (four different cable outlets possible)	09 45 151 1121		



Identification	Colour	Part No.
Colour clips for colour coding the HARTING RJ Industrial® PN connector If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.	White	09 45 850 0001
	Grey	09 45 850 0002
	Yellow	09 45 850 0003
	Magenta	09 45 850 0005
	Red	09 45 850 0007
	Blue	09 45 850 0008
	Green	09 45 850 0009
	Brown	09 45 850 0010

HARTING RJ Industrial® 10G

available Q3 / 2012



HARTING RJ Industrial® cable jack

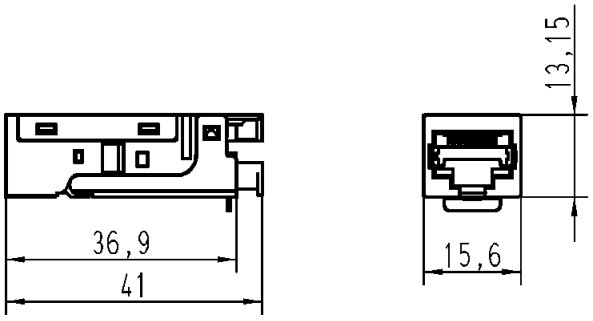
Advantages

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

Technical characteristics

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

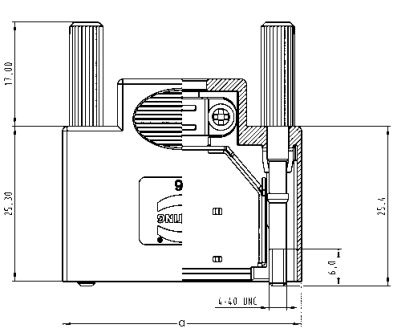
Identification	Part No.	Drawing	Dimensions in mm
HARTING RJ Industrial® 10G cable jack, 8-poles			
AWG 28 … 24	09 45 545 1561		
AWG 24 … 22	09 45 545 1562		
HARTING RJ Industrial® PN cable jack, 4-poles, Cat. 5			
AWG 24 … 22	09 45 545 1120		
Unlocking tool for opening of the HARTING RJ Industrial® cable jacks	20 82 000 9916		



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

Top entry hoods

Identification	No. of contacts	Part No.	Drawing	Dimensions in mm
Plastic hood with internal screen and knurled screws				
Colour: Beige	14	60 13 014 0146 351[1)]		
	26	60 13 026 0146 351[1)]		
	36	60 13 036 0146 351[1)]		
Colour: Black	14	60 13 014 0146 110[1)]		
	26	60 13 026 0146 110[1)]		
	36	60 13 036 0146 110[1)]		



	a	b	c	d
14	31.40	37.00	23.64	7.2
26	39.00	33.00	31.26	8.0
36	45.40	33.00	37.61	9.2

[1)] Temperature range: - 55 °C ... + 85 °C

har-port coupler

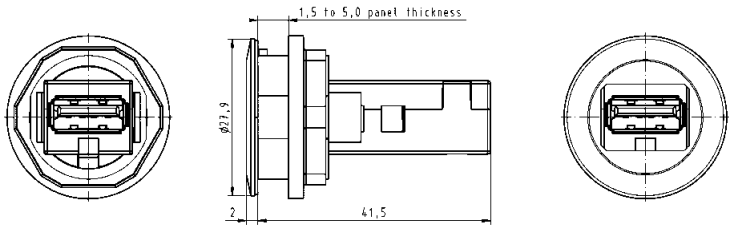
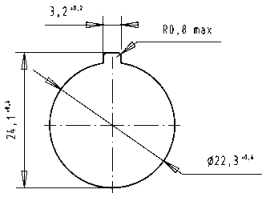
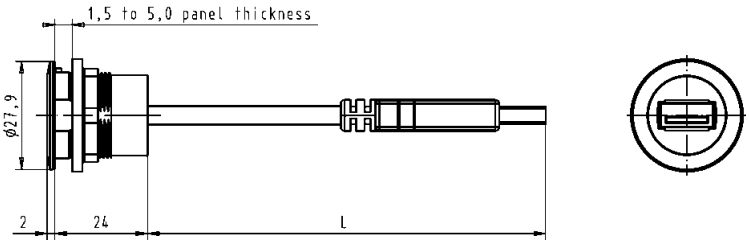
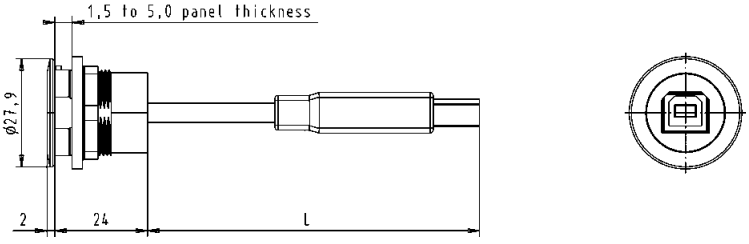
har-port USB coupler

Advantages

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

Technical characteristics

Number of ports	2x USB Typ A
Mounting	Screwable in cover plates
Degree of protection	IP 20
Mating cycles	min. 1500
Temperature range	-25 °C ... +70 °C
Housing material	Polyamide

Identification	Part No.	Drawing	Dimensions in mm
har-port USB 2.0 A-A coupler	09 45 452 1901		
har-port USB 3.0 A-A coupler	09 45 452 1902		
har-port USB 2.0 A-A coupler with cable			
Length: 0.5 m	09 45 452 1920		
1.0 m	09 45 452 1921		
1.5 m	09 45 452 1922		
2.0 m	09 45 452 1923		
3.0 m	09 45 452 1924		
5.0 m	09 45 452 1925		
har-port USB 2.0 B-B coupler with cable			
Length: 0.5 m	09 45 452 1910		
1.5 m	09 45 452 1912		
2.0 m	09 45 452 1913		
3.0 m	09 45 452 1914		

har-port coupler

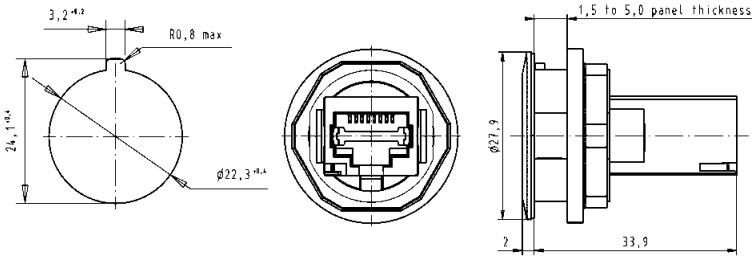
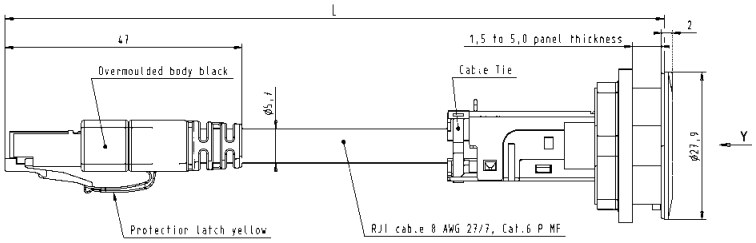
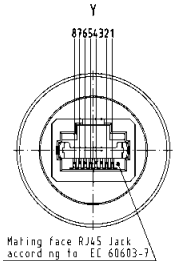
har-port RJ45 coupler

Advantages

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

Technical characteristics

Number of ports	2x RJ45
Transmission performance	Category 6 / class E_A acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Mounting	Screwable in cover plates
Degree of protection	IP 20
Mating cycles	min. 750
Temperature range	-25 °C ... +70 °C
Housing material	Polyamide

Identification	Part No.	Drawing	Dimensions in mm
har-port RJ45 Cat. 6 coupler	09 45 452 1560		
har-port RJ45 Cat. 6 coupler with cable			
Length: 0.2 m	09 45 452 1501		
0.5 m	09 45 452 1504		
1.0 m	09 45 452 1509		
1.5 m	09 45 452 1510		
2.0 m	09 45 452 1511		
3.0 m	09 45 452 1513		
5.0 m	09 45 452 1516		
			
har-port HIFF coupler housing (for all HIFF compatible modules)	09 45 452 0000		

har-port coupler

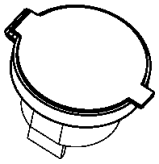
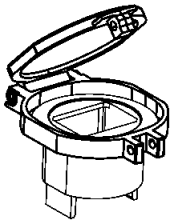
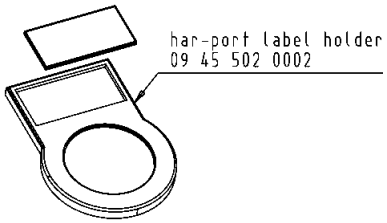
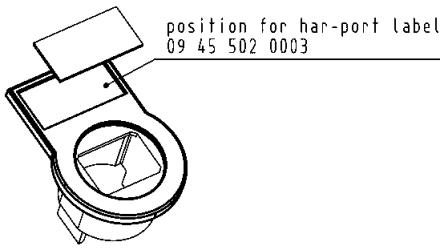
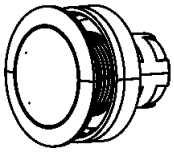
har-port accessories

Advantages

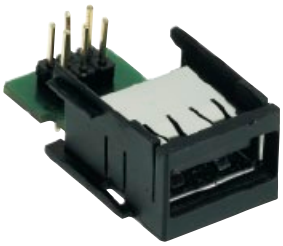
- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Compact and robust design
- Practical accessories

Technical characteristics

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

Identification	Part No.	Drawing	Dimensions in mm
Accessories			
har-port protection cover IP 65 / IP 67 black	09 45 502 0000		
har-port sealing cover	09 45 502 0001		
har-port label holder	09 45 502 0002		
har-port label for label holder 09 45 502 0002	09 45 502 0003		
har-port blind cover IP 65 / 67	09 45 502 0004		

HARTING PushPull USB



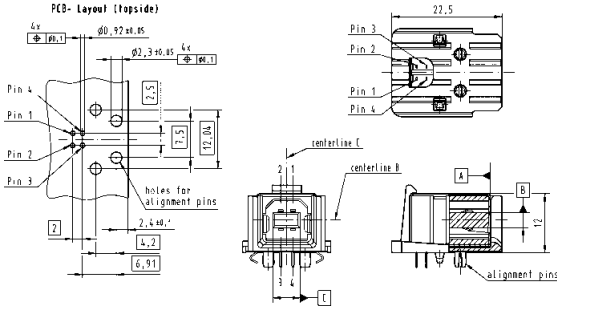
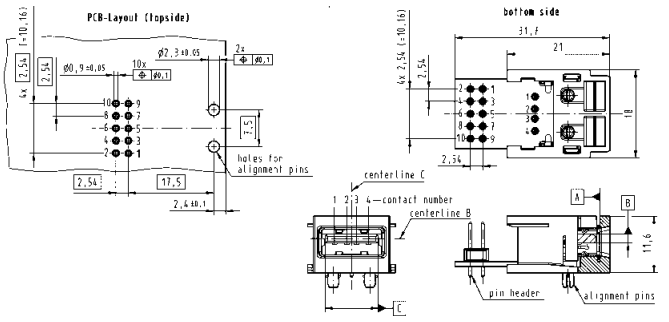
HARTING PushPull USB
Components device side and panel feed-throughs

Advantages

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

Technical characteristics

Mating face	USB 2.0 type B and USB 2.0 / 3.0 type A
Number of contacts	USB 2.0: 4 and USB 3.0: 9
Degree of protection	IP 65 / IP 67
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C

Identification	Part No.	Drawing	Dimensions in mm
Components device side			
USB 2.0 type B Solder jack, angled 90°, THT	09 45 541 1900		
Adapter PCB USB 2.0 type A Jack to pin header	09 45 541 1902		
Adapter PCB USB 3.0 type A Jack to pin header	09 45 541 1905		

All solder jacks and adapter PCB's are suitable for the HARTING PushPull bulkhead mounting housings
09 45 545 0021 / … 0023 / … 0029 / … 0030 / … 0031 / … 0033

HARTING PushPull USB

HARTING PushPull USB
Panel feed-throughs

Advantages

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

Technical characteristics

Mating face	USB 2.0 / 3.0 type A
Number of contacts	USB 2.0: 4 and USB 3.0: 9
Degree of protection	IP 65 / IP 67
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C

Identification	Part No.	Drawing	Dimensions in mm
Panel feed-throughs			
EasyInstall style			
USB 2.0 type A 2 x jack	09 45 245 1903		
USB 3.0 type A 2 x jack	09 45 245 1905		
Compact style			
USB 2.0 type A 2 x jack	09 45 245 1902		
USB 3.0 type A 2 x jack	09 45 245 1904		

HARTING PushPull USB

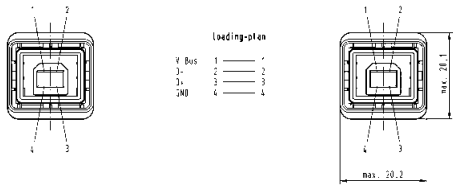
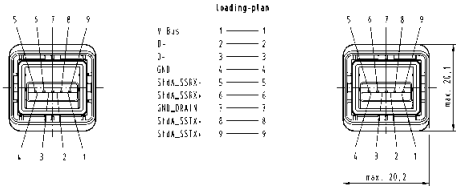
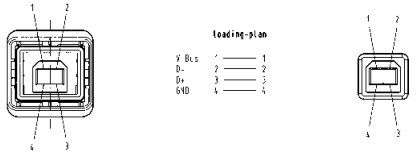
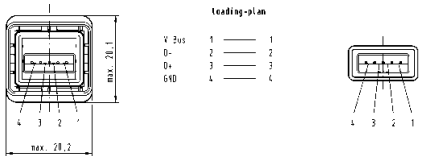
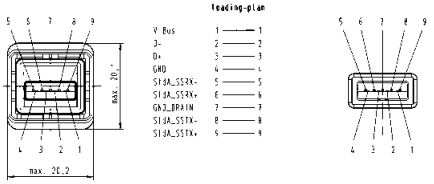
HARTING PushPull USB
System cables

Advantages

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

Technical characteristics

Mating face	USB 2.0 type B and USB 2.0 / 3.0 type A
Number of contacts	USB 2.0: 4 and USB 3.0: 9
Degree of protection	IP 65 / IP 67
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C

Identification	Part No.	Drawing	Dimensions in mm
System cables 2 x PushPull USB Length 1.5 m			
USB 2.0 type B	09 45 145 3902		
USB 2.0 type A	09 45 145 1902		
USB 3.0 type A	09 45 145 2902		
System cables 1 x PushPull USB 1 x IP 20 USB Length 1.5 m			
USB 2.0 type B	09 45 145 3912		
USB 2.0 type A	09 45 145 1912		
USB 3.0 type A	09 45 145 2912		
Other types and lengths on request			

Han® PushPull Signal

available Q3 / 2012

Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
10-poles 100 V / 5 A

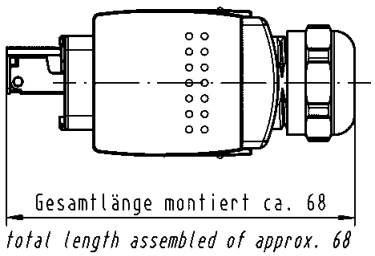
Features

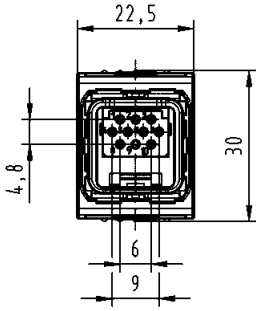
- HARTING PushPull technology
- For the transmission of analog, low voltage and bus signals
- Fully shielded
- 10 contacts
- Touch-proof
- Easy and fast cable installation

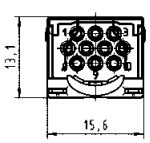
Technical characteristics

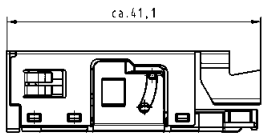
Locking	PushPull technology acc. to IEC 61 076-3-117 variant 14
Degree of protection	IP 65 / IP 67
Mating face	acc. to IEC/PAS 61076-3-11x
Number of contacts	10
Electrical data acc. to DIN EN 61984	5 A 100 V 1.5 kV 3
Contact resistance	10 mΩ
Termination	Crimp
Conductor cross section	AWG 24 … 18; 0.25 … 0.82 mm²
Conductor diameter	max. 2.1 mm
Outer cable diameter	6.5 … 9.5 mm / 4 … 11 mm
Shielding	Fully shielded, 360° shielding contact
Mating cycles	min. 500
Temperature range	-40 °C ... +70 °C
Housing material	Plastic, black Zinc die-cast, nickel-plated
Flammability acc. to UL 94	V 0

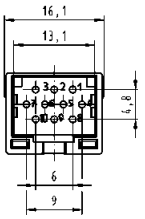
Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull Signal			
Connector set 10-poles incl. metal housing and female insert 4 … 11 mm	09 35 261 0401		
Connector set 10-poles incl. plastic housing and female insert 6.5 … 9.5 mm	09 35 261 0421		
Order D-Sub crimp female contacts separately			
Insert for panel feed-through HIFF, 10-poles incl. male insert	09 45 545 9010		
Order D-Sub crimp male contacts separately			

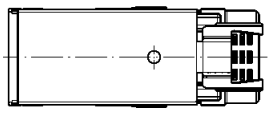


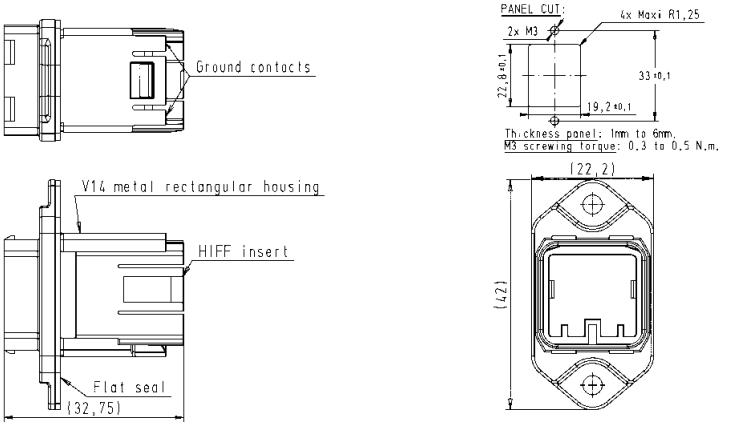
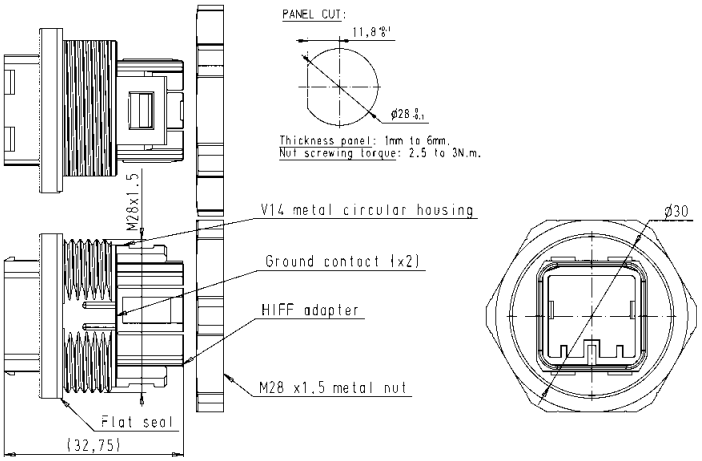
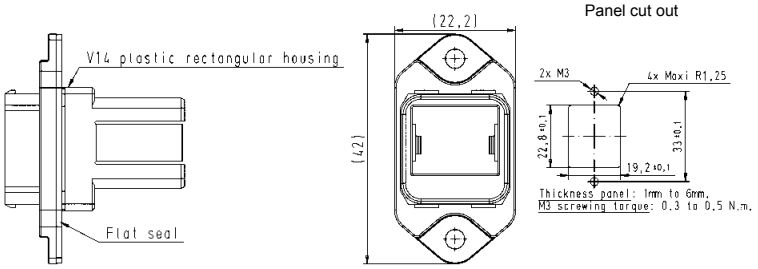










Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull panel feed-through HIFF to hold the 10-poles insert			
Metal rectangular	09 35 012 0311		
Metal circular	09 35 012 0312		
Plastic rectangular	09 35 012 0331		
D-Sub crimp contacts			
(Connector side)			
for AWG 24-20; 0.25-0.56 mm²	09 67 000 8278[1)]		
for AWG 22-18; 0.33-0.82 mm²	09 67 000 3476[2)]		
(Device side)			
for AWG 24-20; 0.25-0.56 mm²	09 67 000 8178[1)]		
for AWG 22-18; 0.33-0.82 mm²	09 67 000 3576[2)]		

[1)] To be used with crimp tool 09 99 000 0175
[2)] To be used with crimp tool 09 99 000 0501. Suitable locator: 61 03 600 0531

HARTING PushPull Signal

available Q3 / 2012

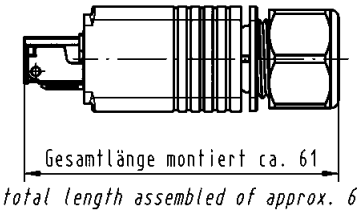
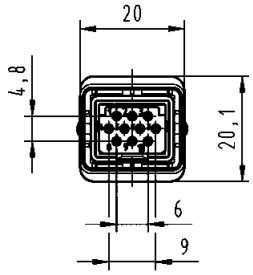
HARTING PushPull, type acc. to IEC 61 076-3-106 variant 4
10-poles 100 V / 5 A

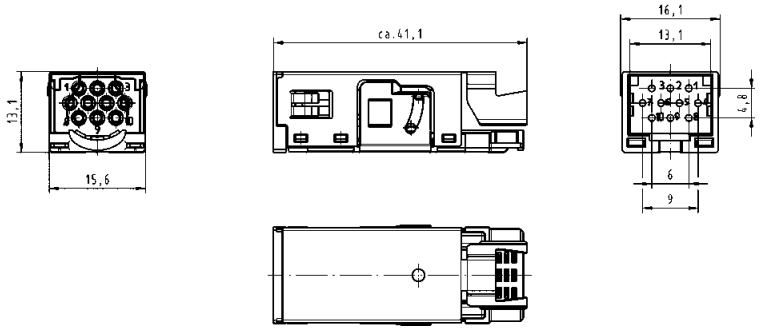
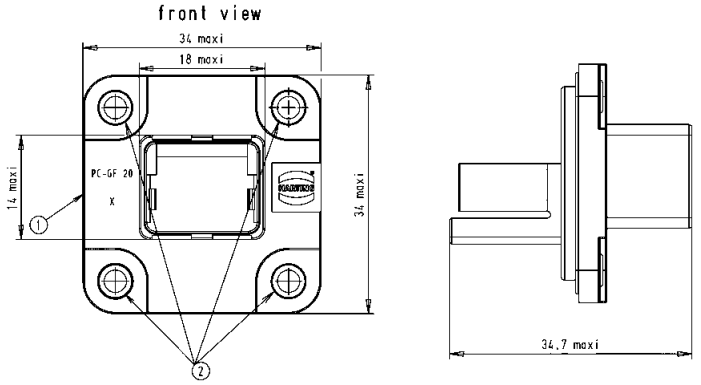
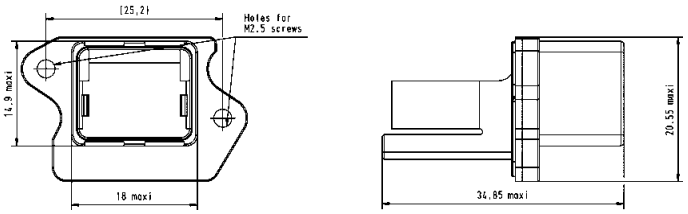
Features

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

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP 65 / IP 67
Mating face	acc. to IEC/PAS 61 076-3-11x
Number of contacts	10
Electrical data acc. to DIN EN 61 984	5 A 100 V 1.5 kV 3
Contact resistance	10 mΩ
Termination	Crimp
Conductor cross section	0.75 mm²
Conductor diameter	max. 2.1 mm
Outer cable diameter	6.5 … 9.5 mm
Shielding	Fully shielded, 360° shielding contact
Mating cycles	min. 500
Temperature range	-40 °C ... +70 °C
Housing material	Plastic, black Zinc die-cast, nickel-plated
Flammability acc. to UL 94	V 0

Identification	Part No.	Drawing	Dimensions in mm
HARTING PushPull Signal Connector set 10-poles incl. plastic housing and female insert Order D-Sub crimp female contacts separately	09 45 145 9010		

Identification	Part No.	Drawing	Dimensions in mm
HARTING PushPull Signal			
Insert for panel feed-through HIFF, 10-poles incl. male insert	09 45 545 9010		
Order D-Sub crimp male contacts separately			
HARTING PushPull housing bulkhead mounting, plastic			
EasyInstall	09 45 545 0032		
Compact	09 45 545 0028		
D-Sub crimp contacts			
(Female)			
for AWG 24-20; 0.25-0.56 mm²	09 67 000 8278[1)]		
for AWG 22-18; 0.33-0.82 mm²	09 67 000 3476[2)]		
(Male)			
for AWG 24-20; 0.25-0.56 mm²	09 67 000 8178[1)]		
for AWG 22-18; 0.33-0.82 mm²	09 67 000 3576[2)]		

1) To be used with crimp tool 09 99 000 0175
2) To be used with crimp tool 09 99 000 0501. Suitable locator: 61 03 600 0531

Han® PushPull V14 cable to cable housing plastic

available Q2 / 2012

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

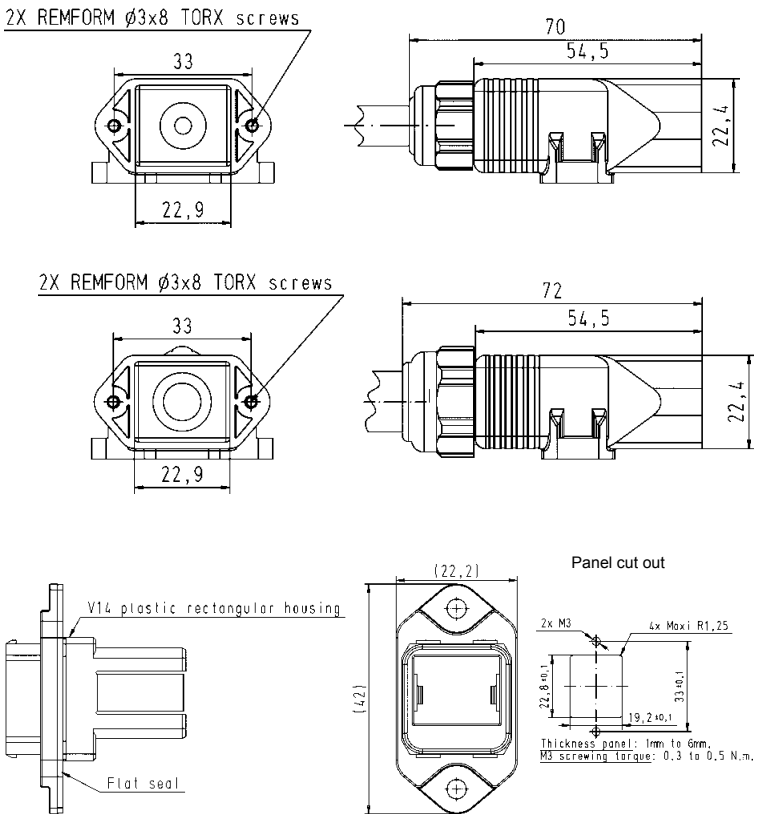
Features

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

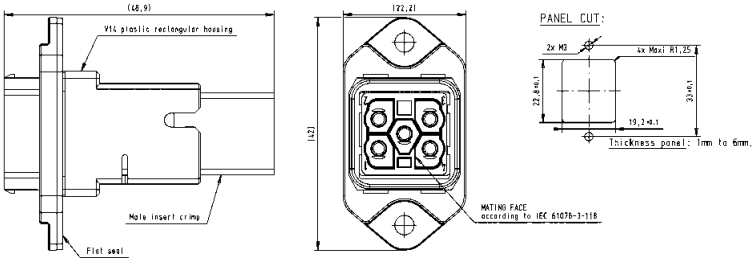
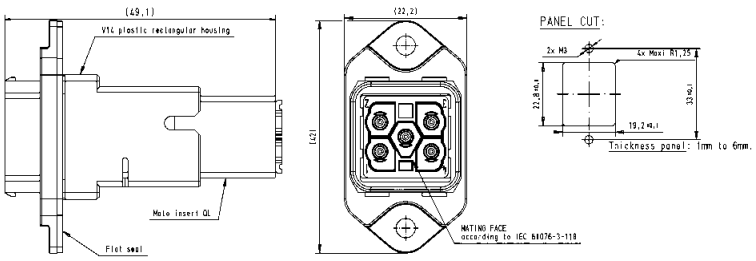
Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117 variant 14
Degree of protection	IP 65 / IP 67
Outer cable diameter	6.5 … 9.5 mm / 9 … 13 mm
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Plastic, black
Flammability acc. to UL 94	V 0

Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull cable to cable housings, plastic (Order housing bulkhead mounting and insert separately)			
for outer cable diameter 6.5 … 9.5 mm	09 35 002 0431		
for outer cable diameter 9 … 13 mm	09 35 002 0433		
Suitable bulkhead housing, plastic			
for RJ45 / Signal	09 35 012 0331		
Inserts for RJ45 / Signal			
RJ 45: 8-poles, Cat. 6 / class E_A			
Ha-Vis preLink® set AWG 22/23	20 82 001 0001		
HARTING RJ Industrial® cable jack with IDC termination			
AWG 22-24, 8-poles	09 45 545 1562		
AWG 24-28, 8-poles	09 45 545 1561		
AWG 22-24, 4-poles, Cat. 5	09 45 545 1120		
Signal: 10-poles, 60 V / 3 A*	09 45 545 9010		



* Order D-Sub crimp male contacts separately (see page 161)

Identification	Part No.	Drawing	Dimensions in mm
Suitable bulkhead housing, plastic			
for power, 5-poles, 690 V / 16 A, incl. housing bulkhead mounting and insert			
with crimp termination (Order Han® P crimp male contacts separately)	09 35 231 0331		
with Han-Quick Lock® termination			
0.5 … 2.5 mm²	09 35 232 0331		
0.25 … 1.5 mm²	09 35 234 0331		
Coding element power			
10 pieces each for device and cable side enables 4 times coding without contact loss	09 35 000 6190		

HARTING PushPull V4 cable to cable housing plastic

available Q2 / 2012

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

Features

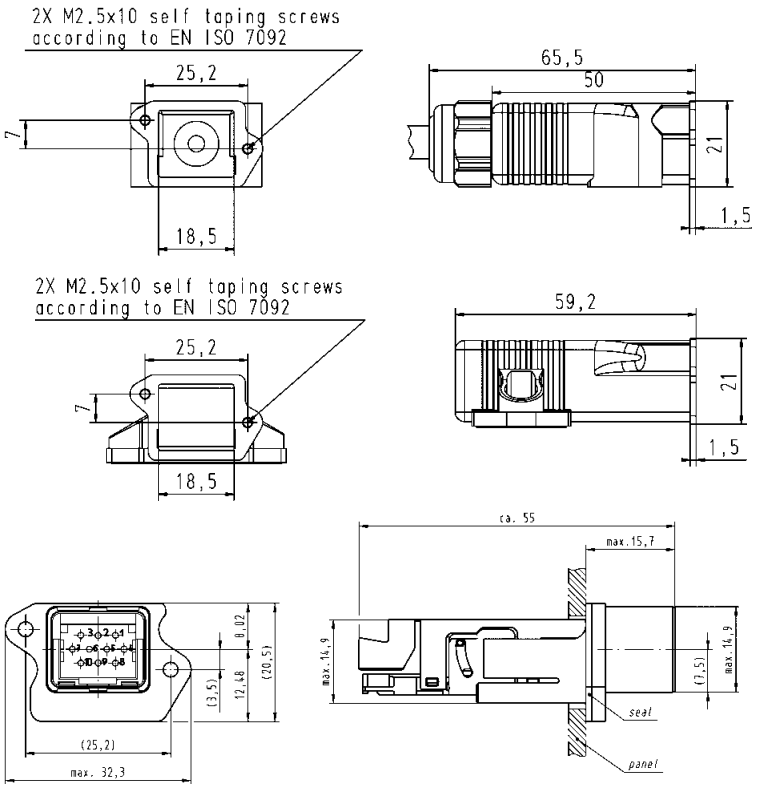
- HARTING PushPull technology
- Ideal for prototyping
- Can be combined with panel feed-throughs for power, data and signal

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP 65 / IP 67
Outer cable diameter	6.5 … 9.5 mm / 9 … 13 mm
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Plastic, black
Flammability acc. to UL 94	V 0

Identification	Part No.
HARTING PushPull cable to cable housings, plastic (Order housing bulkhead mounting and insert separately)	
for outer cable diameter 6.5 … 9.5 mm	09 45 345 0000
HARTING PushPull bulkhead housings, plastic (Order housing bulkhead mounting and insert separately)	09 45 345 0001
Suitable HARTING PushPull Signal panel feed-through	09 45 245 9010
Suitable bulkhead housing, plastic	
for RJ45 / Signal	09 45 545 0028
Inserts for RJ45 / Signal	
RJ 45: 8-poles, Cat. 6 / class E_A	
Ha-Vis preLink® set AWG 22/23	20 82 001 0001
HARTING RJ Industrial® cable jack with IDC termination	
AWG 22-24, 8-poles	09 45 545 1562
AWG 24-28, 8-poles	09 45 545 1561
AWG 22-24, 4-poles, Cat. 5	09 45 545 1120
Signal: 10-poles, 60 V / 3 A*	09 45 545 9010

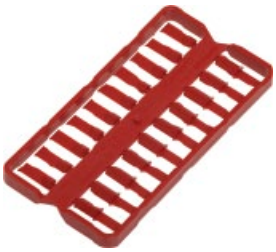
Drawing — Dimensions in mm



* Order D-Sub crimp male contacts separately (see page 163)

Han® PushPull Power 4/0

Han-Quick Lock®



Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
5-poles, 690 V / 16 A

Features

- HARTING PushPull technology
- Compact, space-saving design
- Touch-proof
- Field-assembly thanks to Han-Quick Lock® fast termination technology
- 4 times coding without contact loss
- NEW: Larger termination cross section for conductors 0.25 - 1.5 mm²

Technical characteristics

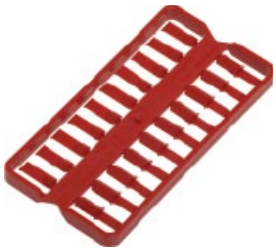
Locking	PushPull technology acc. to IEC 61 076-3-117 variant 14
Mating face	acc. to IEC 61 076-3-118
Degree of protection	IP 65 / IP 67
Number of contacts	4 + PE
Electrical data acc. to DIN EN 61 984	16 A 690 V 4 kV 3
Termination cross section	0.25 – 2.5 mm²
Mating cycles	min. 500
Temperature range	-40 °C ... +70 °C
Housing material	Plastic, black Zinc die-cast, nickel-plated
Flammability acc. to UL 94	V 0

Identification	Part No.	Drawing	Dimensions in mm
Connetor, plastic incl. housing and Han-Quick Lock® female insert			
for termination cross section 0.25 - 1.5 mm² 6.5 - 9.5 mm clamp range	09 35 234 0421		
for termination cross section 0.5 - 2.5 mm² 9 - 13 mm clamp range	09 35 232 0423		
Connetor, metal incl. housing and Han-Quick Lock® female insert			
for termination cross section 0.25 - 1.5 mm² 4 - 11 mm clamp range	09 35 234 0401		
for termination cross section 0.5 - 2.5 mm² 4 - 11 mm clamp range	09 35 232 0401		
Coding element 10 pieces each for device and cable side enables 4 times coding without contact loss	09 35 000 6190		

Han® PushPull Power 4/0 Plastic

Han-Quick Lock®

available Q2 / 2012



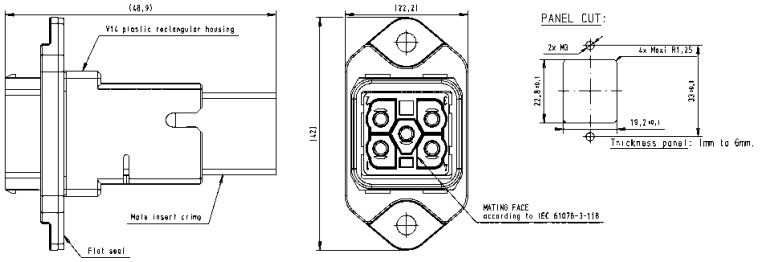
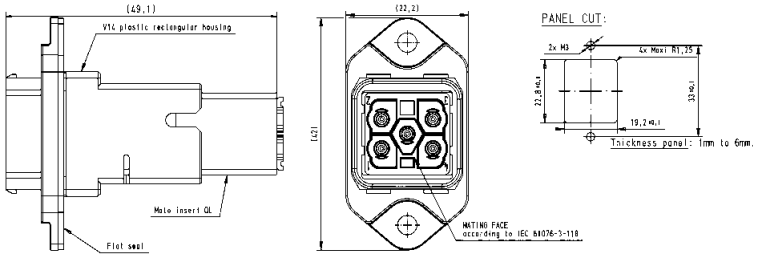
Han® PushPull,
type acc. to
IEC 61 076-3-117 variant 14
Panel feed-through, 5-poles, 690 V / 16 A

Features

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

Technical characteristics

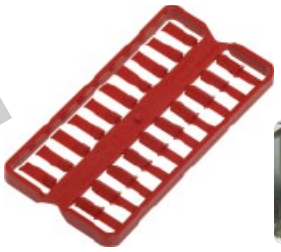
Locking	PushPull technology acc. to IEC 61 076-3-117 variant 14
Mating face	acc. to IEC 61 076-3-118
Degree of protection	IP 65 / IP 67
Number of contacts	4 + PE
Electrical data acc. to DIN EN 61 984	16 A 690 V 4 kV 3
Termination cross section	0.25 – 2.5 mm²
Mating cycles	min. 500
Temperature range	-40 °C ... +70 °C
Housing material	Plastic, black
Flammability acc. to UL 94	V 0

Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull Power 4/0 Panel feed-through 5-poles, 690 V / 16 A incl. bulkhead housing and male insert			
with crimp termination (Order crimp male contacts separately)	09 35 231 0331		
with Han-Quick Lock® termination			
0.5 … 2.5 mm²	09 35 232 0331		
0.25 … 1.5 mm²	09 35 234 0331		
Coding element 10 pieces each for device and cable side enables 4 times coding without contact loss	09 35 000 6190		

Han® PushPull Power 4/0 Metal

Han-Quick Lock®

available Q2 / 2012



Han® PushPull,
type acc. to
IEC 61 076-3-117 variant 14
Panel feed-through, 5-poles, 690 V / 16 A

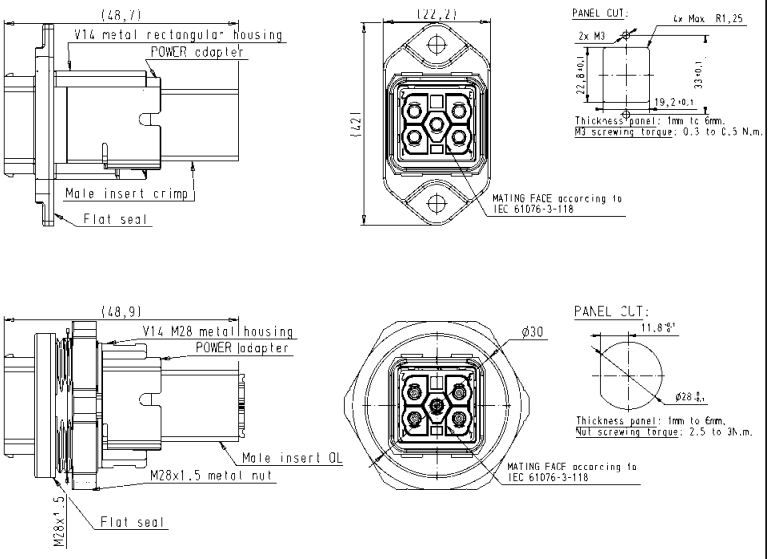
Features

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

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117 variant 14
Mating face	acc. to IEC 61 076-3-118
Degree of protection	IP 65 / IP 67
Number of contacts	4 + PE
Electrical data acc. to DIN EN 61 984	16 A 690 V 4 kV 3
Termination cross section	0.25 – 2.5 mm²
Mating cycles	min. 500
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated
Flammability acc. to UL 94	V 0

Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull Power 4/0 Panel feed-through 5-poles, 690 V / 16 A incl. bulkhead housing and male insert			
Rectangular panel cut out			
with crimp termination (Order crimp male contacts separately)	09 35 231 0311		
with Han-Quick Lock® termination			
0.5 … 2.5 mm²	09 35 232 0311		
0.25 … 1.5 mm²	09 35 234 0311		
Circular panel cut out			
with crimp termination (Order crimp male contacts separately)	09 35 231 0312		
with Han-Quick Lock® termination			
0.5 … 2.5 mm²	09 35 232 0312		
0.25 … 1.5 mm²	09 35 234 0312		
Coding element 10 pieces each for device and cable side enables 4 times coding without contact loss	09 35 000 6190		



Han® PushPull RJ45 Metal

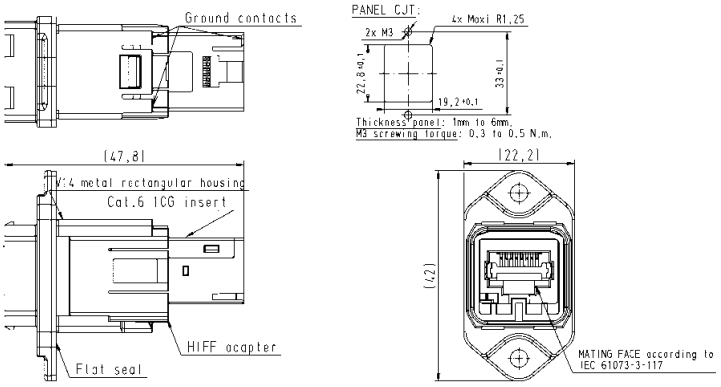
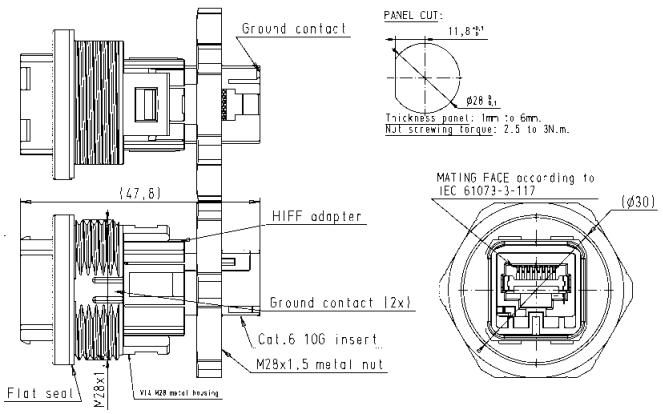
Han® PushPull, type acc. to IEC 61076-3-117 variant 14
RJ45 panel feed-through

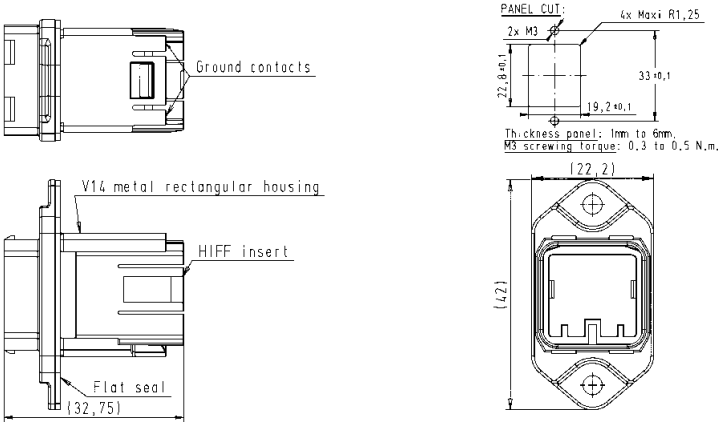
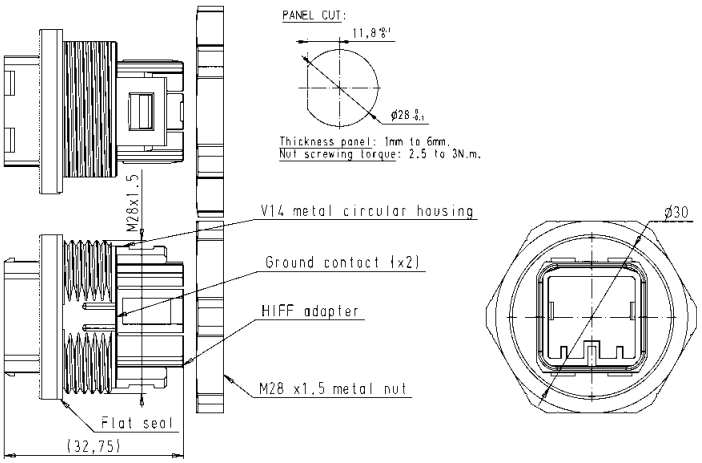
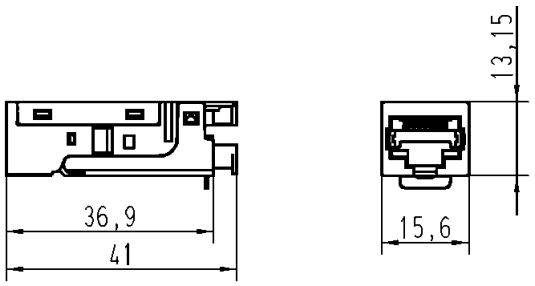
Features

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

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117
Degree of protection	IP 65 / IP 67
Mating face	RJ45 acc. to IEC 60 603-7
Transmission performance	acc. to ISO/IEC 11 801:2002, EN 50 173-1, category 6 / class E_A up to 500 MHz
Transmission rate	10 / 100 Mbit/s and 1 / 10 Gbit/s
Number of contacts	8
Shielding	Fully shielded, 360° shielding contact
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated
Flammability acc. to UL 94	V 0

Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull RJ45 10G			
Panel feed-through, Cat. 6 including bulkhead housing for rectangular panel cut out, flat seal and HARTING RJ Industrial® 10G RJ45 bulkhead, isolated bulkhead fixture	09 35 225 0311		
Panel feed-through, Cat. 6 including bulkhead housing for circular panel cut out, flat seal and HARTING RJ Industrial® 10G RJ45 bulkhead, isolated bulkhead fixture	09 35 225 0312		

Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull RJ45 10G			
Panel feed-through to mount HIFF inserts, e.g. Ha-VIS preLink® RJ45-module, RJ Industrial cable jack Order inserts separately			
Bulkhead housing for rectangular panel cut out, incl. plastic adapter	09 35 012 0311		
Bulkhead housing for circular panel cut out, incl. plastic adapter and fixing nut	09 35 012 0312		
Ha-VIS preLink® set RJ45 jack AWG 22/23 consists of: • 1x Ha-VIS preLink® module RJ45 jack • 1x Ha-VIS preLink® terminal module • 1x cable tie	20 82 001 0001		
HARTING RJ Industrial® cable jack			
AWG 22-24, 8-poles, Cat. 6	09 45 545 1562		
AWG 24-28, 8-poles, Cat. 6	09 45 545 1561		
AWG 22-24, 4-poles, Cat. 5	09 45 545 1120		

Han® PushPull RJ45 Plastic

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

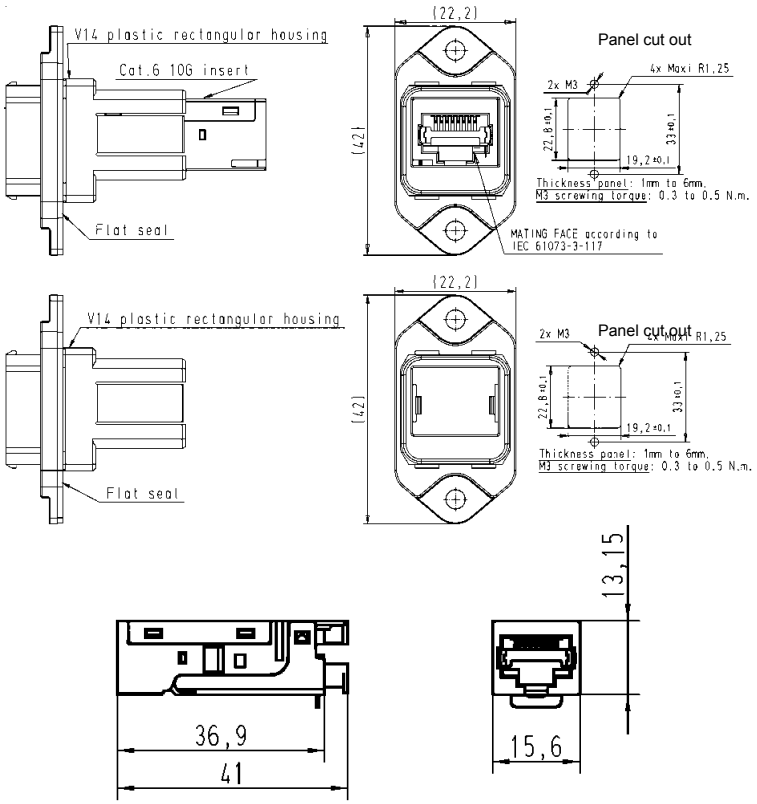
Features

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

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117, variant 14
Degree of protection	IP 65 / IP 67
Mating face	RJ45 acc. to IEC 60 603-7
Transmission performance	acc. to ISO/IEC 11 801:2002, EN 50 173-1, category 6 / class E_A up to 500 MHz
Transmission rate	10 / 100 Mbit/s and 1 / 10 Gbit/s
Number of contacts	8
Shielding	Fully shielded, 360° shielding contact
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Plastic, black
Flammability acc. to UL 94	V 0

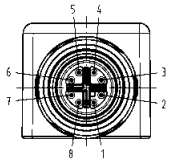
Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull RJ45			
Panel feed-through Cat. 6 including housing and HARTING RJ Industrial® 10G RJ45 bulkhead	09 35 225 0331		
Panel feed-through to mount HIFF inserts, e.g. Ha-VIS preLink® RJ45-module, RJ Industrial cable jack Order inserts separately	09 35 012 0331		
Ha-VIS preLink® set RJ45 jack AWG 22/23 consists of: • 1x Ha-VIS preLink® module RJ45 jack • 1x Ha-VIS preLink® terminal module • 1x cable tie	20 82 001 0001		
HARTING RJ Industrial® cable jack			
AWG 22-24, 8-poles, Cat. 6	09 45 545 1562		
AWG 24-28, 8-poles, Cat. 6	09 45 545 1561		
AWG 22-24, 4-poles, Cat. 5	09 45 545 1120		



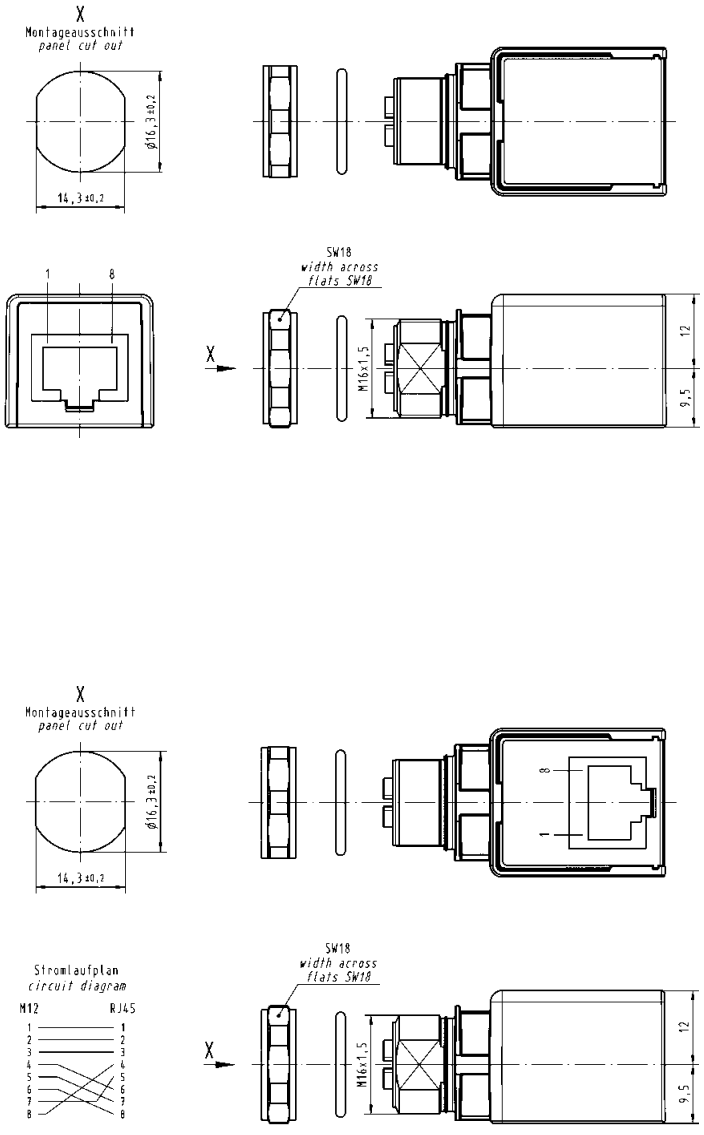
Circular connector *har*-speed M12

available May 2012

X-kodiert / X-coded

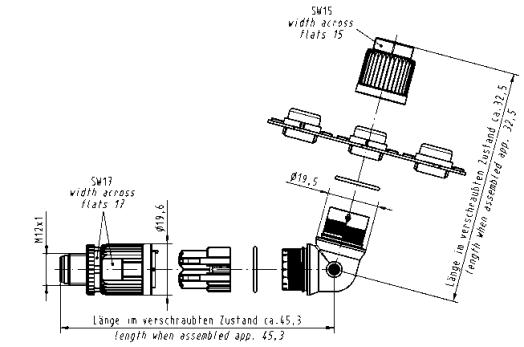
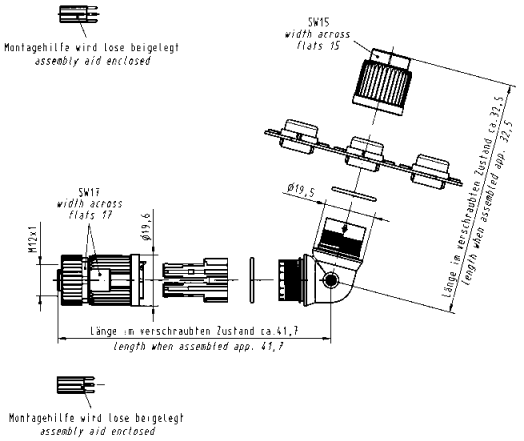


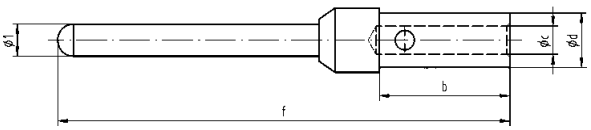
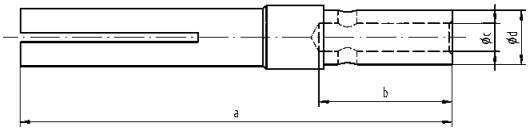
Identification	Part No.	Drawing	Dimensions in mm
har-speed M12 adapter M12-RJ45			
straight, Cat. 6_A	21 03 381 2800		
angled, Cat. 6_A	21 03 381 4800		



Circular connector M12 shielded

available August 2012

Identification	Part No. Male	Part No. Female	Drawing	Dimensions in mm
Han® M12 Crimp, angled				
5 poles, A-coded	21 03 812 3505			
4 poles, D-coded	21 03 882 3405			
5 poles, A-coded		21 03 812 4505		

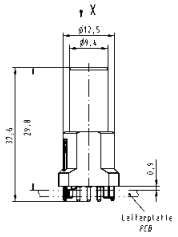
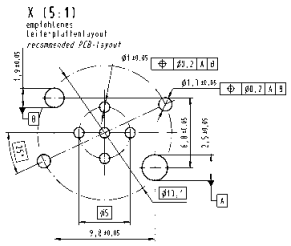
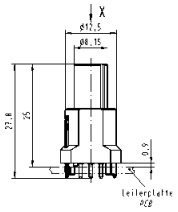
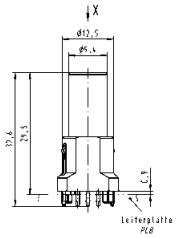
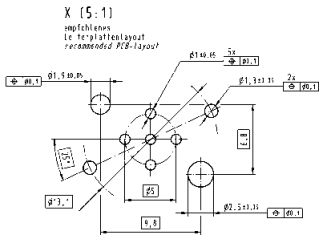
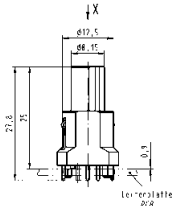
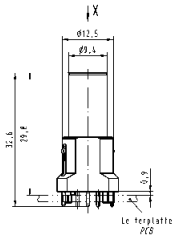
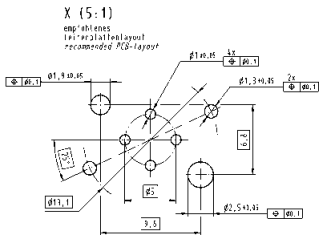
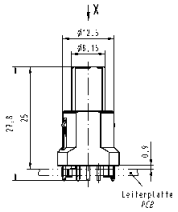
Identification	Part No.	Drawing
Crimping tool		
for M12 Crimp and *har*-speed M12	**09 99 000 0501**	
Locator	**09 99 000 0531**	
Single contacts (500 mating cycles)		
turned male contacts		
AWG 24-20 / 0.25-0.52 mm²	**09 67 000 8576**	
AWG 26-22 / 0.13-0.33 mm²	**09 67 000 5576**	
		
turned female contacts		
AWG 24-20 / 0.25-0.52 mm²	**09 67 000 8476**	
AWG 26-22 / 0.13-0.33 mm²	**09 67 000 5476**	
		

	a	b	c	d	e	f
AWG 26-22	13.6	4.2	0.88	1.7	8.2	14.2
AWG 24-20	13.6	4.2	1.13	1.7	8.2	14.2

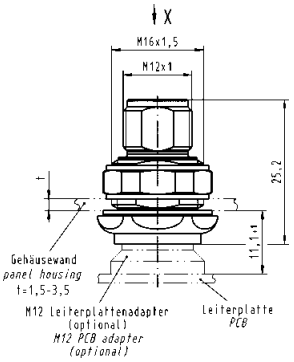
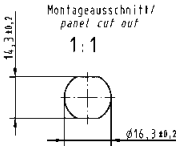
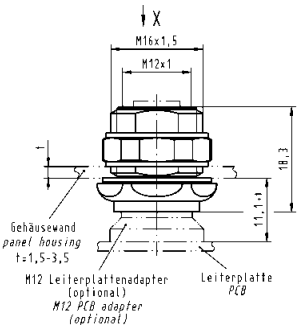
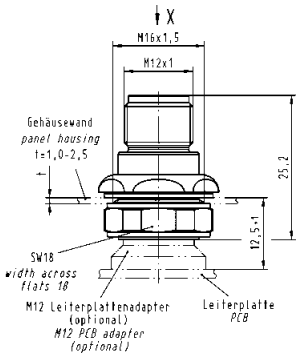
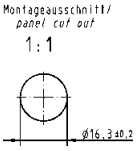
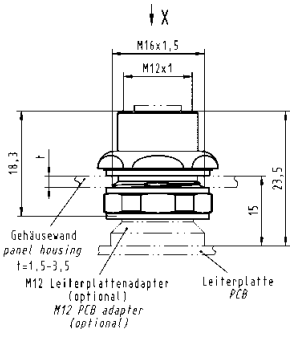
Order crimp contacts separately

M12 PCB adapter shielded

available June 2012

Identification	Part No. Male	Part No. Female	Drawing	Dimensions in mm
M12 PCB adapter, screened version				
5 poles, A-coded	21 03 321 1518			
		21 03 321 2518		
5 poles, B-coded	21 03 341 1518			
		21 03 341 2518		
4 poles, D-coded	21 03 381 1418			
		21 03 381 2418		

available June 2012

Identification	Part No. Male	Part No. Female	Drawing	Dimensions in mm
Housing				
for rear mounting	21 03 301 1000			
		21 03 301 2000		
for front mounting	21 03 301 1001			
		21 03 301 2001		

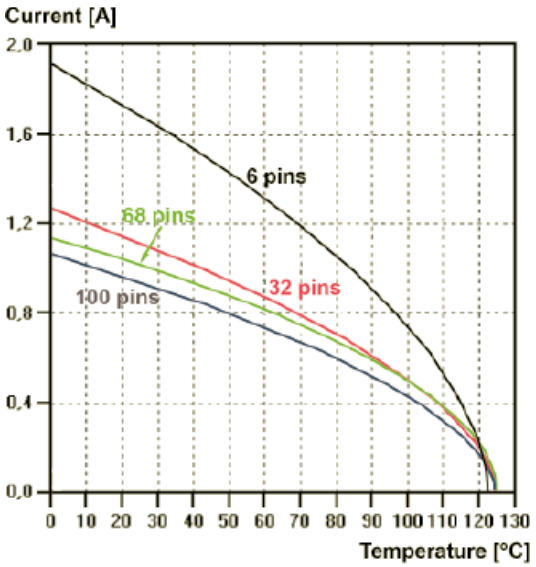
Notes

Number of contacts	6, 8, 10 … 96, 98, 100
Connector pitch	1.27 mm x 1.27 mm [0.050'' x 0.050'']
Clearance and creepage distance	
Board connectors (SMT)	min. 0.4 mm
Cable connectors (IDC)	
AWG 30/1 (solid)	min. 0.35 mm
AWG 30/7 (stranded)	min. 0.4 mm
Test voltage $U_{r.m.s.}$	500 V
Contact resistance	< 25 mΩ
Insulation resistance	> 10 GΩ
Insertion and withdrawal force	approx. 0.5 N / contact
Working temperature range	– 55 °C … + 125 °C
The higher temperature limit includes the local ambient and heating effects of the contacts under load	
Temperature during reflow soldering (acc. to ECA/IPC/JEDEC J-STD-075 Level PSL R0)	min. 150 s > 217 °C min. 30 s > 240 °C
Electrical termination	
Board connectors	SMT (Surface Mount Technology)
Cable connectors	IDC (Insulation Displacement Connection)
Materials	
Moulding material	LCP
UL approval	UL 94-V0
CTI value (Comparative Tracking Index)	175
Contacts base material	Copper alloy
Contact surface	
Mating side	
Board connectors	Au over PdNi (acc. performance level)
Cable connectors	Au over PdNi (acc. performance level)
Termination side	
Board connectors (SMT)	Sn
Cable connectors (IDC)	Sn
Flat cable requirements for IDC connectors	
PVC flat cables:	AWG 30/1 (solid) AWG 30/7 (stranded)
PTFE flat cables:	AWG 30/1 (solid)
Insulation diameter:	min. 0.55 mm - max. 0.75 mm
Working current acc. to IEC 60512	
70 °C ambient temperature @ 80 % derating	
6 pins	1.2 A
32 pins	0.8 A
68 pins	0.75 A
100 pins	0.7 A

Current carrying capacity

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

Control and test procedures according to DIN IEC 60 512.



Derating curve at I_{max}*0.8 (IEC 60512-5-2)

Durability

Performance level 1 (recommended for majority of applications)

Initial 250 mating cycles, 10 days gas test (25 °C/75 % r.h.) using H_2S 10 ppb, NO_2 200 ppb, CL_2 10 ppb, SO_2 200 ppb. Measurement of contact resistance. The remaining 250 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment.

Part number definition: 15 . . . . . 2 . . . . . .

Performance level 2

Initial 125 mating cycles, 4 days gas test (25 °C/75% r.h.) using H_2S 10 ppb, NO_2 200 ppb, CL_2 10 ppb, SO_2 200 ppb. Measurement of contact resistance. The remaining 125 mating cycles are subject to measurement of contact resistance and visual inspection. Visual inspection. No abrasion of the contact finish through to the base material. No functional impairment.

Part number definition: 15 . . . . . 6 . . . . . .

Performance level S4

Defined contact surface of min. 0.06 µm Au over 0.7+0.2 µm PdNi.

Part number definition: 15 . . . . . 5 . . . . . .

Working voltage acc. to IEC 60664-1

The working voltage depends on user specific operational conditions. Depending on the installation category, the degree of pollution and the entire electrical environment, the working voltage is different. The standard IEC 60664-1 specifies, in general, the minimum insulation distances for equipment. But it can also be used to determine the maximum working voltage with given requirements.

The following table shows the most common conditions applicable for the *har*-flex® connectors and exemplary calculations for the working voltage. For installation category, degree of pollution and other requirements which are not shown in the table we refer to the IEC 60664-1.

Clearance / Creepage distance	0.4 mm			
CTI-Value	< 400			
Isolation group	III a/b			
Electrical field type	Case A (Inhomogeneous field)		Case B (Homogeneous field)	
Installation category	I	II	I	II
Degree of pollution	1	1	1	1
Working voltage max.	**150 V**	**100 V**	**150 V**	**150 V**

Explanations:

– CTI value and isolation group are fixed values by the *har*-flex® connector characteristics.

– Installation category I: Equipment is intended for use only in appliances or installation parts, in which no overvoltages can occur. Equipment in this installation category in normally operated at extra low voltage.

– Installation category II: Equipment is intended for use in installations or parts of installations, in which lightning overvoltages need not be considered. Overvoltages caused by switching must be taken into account.

– Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence.

– Pollution degree 2: Only non-conductive pollution occurs. A temporary conductive caused by condensation must be expected occasionally.

Part number definition

The *har*-flex® part numbers have 14 digits and are based on the following scheme:

1	5		X	X		X	X	X		X	X	X	X		X	X	X

15 *har*-flex® family

Connector style
- 11 straight male connector 1.75 mm stacking height
- 12 straight male connector 3.25 mm stacking height
- 15 angled male connector
- 21 straight female connector 6.25 mm stacking height
- 22 straight female connector 9.05 mm stacking height
- 25 angled female connector
- 29 IDC flat band cable connector / accessories

Number of contacts

Durability
- 2 performance level 1
- 5 performance level S4
- 6 performance level 2

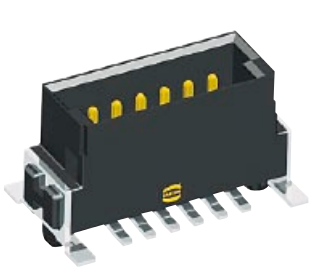
Termination
- 5 IDC termination
- 6 SMT termination

Counting number

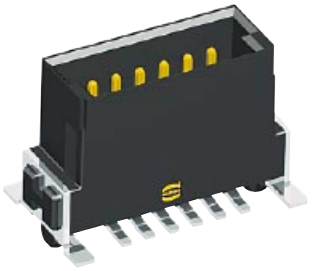
Packaging
- 000 Tape and reel packaging Tray packaging for IDC cable connectors
- 333 Samples

Stacking heights of straight connector versions

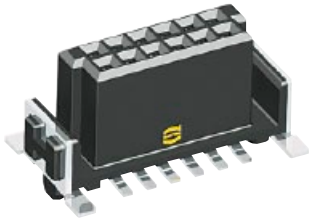
The *har*-flex® connectors cover mezzanine applications with a range of straight versions for four different stacking heights that can be used to interconnect PCBs arranged in parallel stacks with spacing between 8.0 mm and 13.8 mm.



Male 1.75 mm



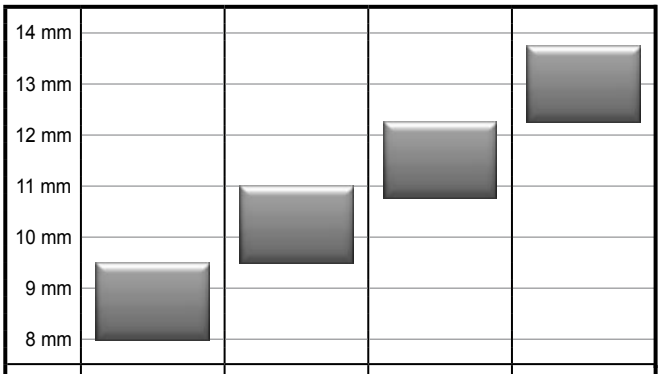
Male 3.25 mm



Female 6.25 mm

Female 9.05 mm

Due to the wiping lengths of 1.5 mm, these four connectors cover the distance of 8 mm to 13.8 mm continuously.

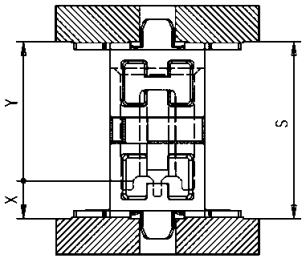


stacking heights	male 1.75 mm female 6.25 mm	male 3.25 mm female 6.25 mm	male 1.75 mm female 9.05 mm	male 3.25 mm female 9.05 mm
PCB distance	8 mm - 9.5 mm	9.5 mm - 11 mm	10.8 mm - 12.3 mm	12.3 mm - 13.8 mm
part numbers	15 11 … 15 21 …	15 12 … 15 21 …	15 11 … 15 22 …	15 12 … 15 22 …

Mating options

Mezzanine connection

straight female

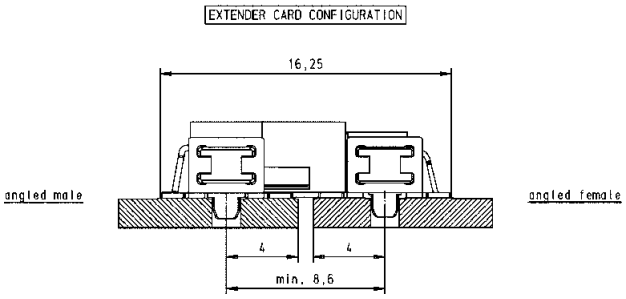


straight male

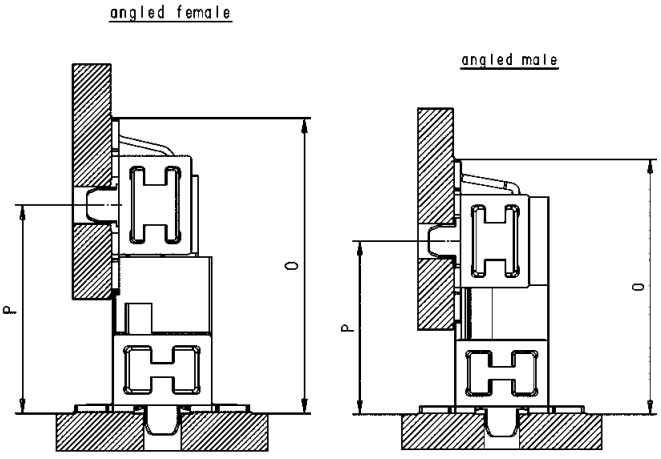
3.25	9.05	12.3	13.8
1.75	9.05	10.8	12.3
3.25	6.25	9.5	11
1.75	6.25	8	9.5
X	*Y*	*Smin*	* *Smax*

* Smax = Smin + 1,5 wiping length with additional contact overlap security

Extender Card connection



Mother-to-Daughtercard connection



straight male

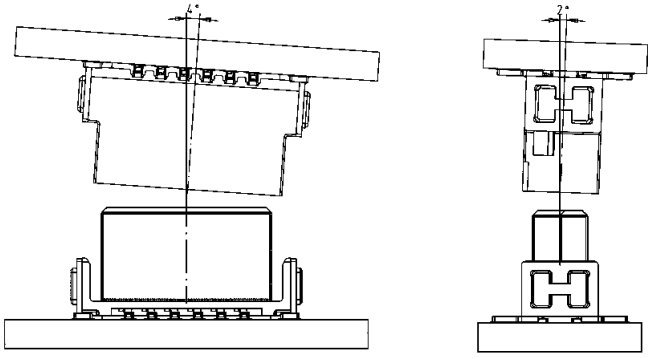
3.25	10.25	14.08
1.75	8.75	12.58
X	*P min.*	*O*

straight female

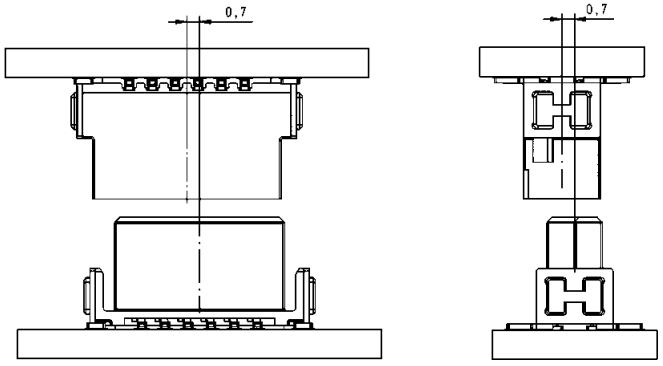
9.05	10.5	14.33
6.25	7.7	11.53
Y	*P min.*	*O*

Mating conditions

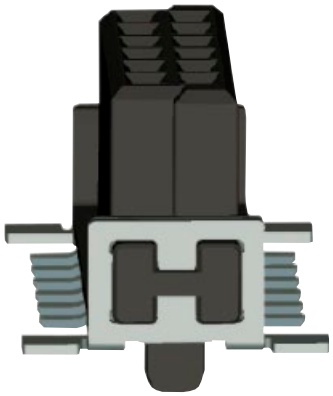
Inclination



Mismating



SMT processing notes



The *har*-flex® SMT connectors meet the highest demands in terms of their processing capabilities.

The connectors are delivered in a tape and reel packaging optimized for automatic assembly machines. A vacuum cover enables the automatic assembly with a vacuum nozzle.

The insulation body material is high temperature resistant, and due to the black colour a secure camera recognition is ensured.

For a reliable SMT solder process, the termination pins are 100 % checked for coplanarity.

Process / Moisture Sensitivity

During the reflow solder process, the connector has to resist extreme variations in temperature. Connectors consist in general of both plastic and metal parts, which have a different behaviour during the solder process. The Process Sensivity and also the Moisture Sensivity are tested according the ECA/IPC/JEDEC J-STD-075 specification.

Process Sensivity:

PSL means Process Sensitivity Level. PSL is a rating used to identify a component that is solder process sensitive. Damages of the connector after three times soldering are not permitted (e.g. melted edges).

Moisture Sensitivity:

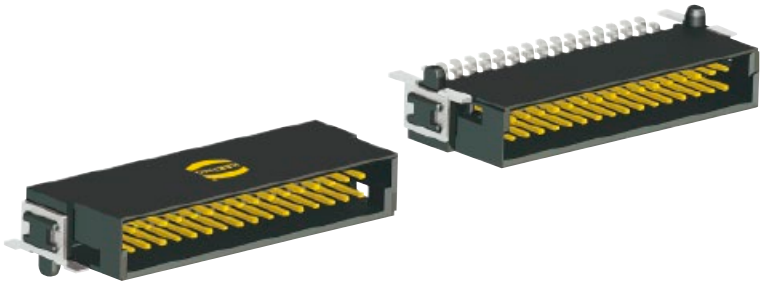
MSL means Moisture Sensitivity Level. MSL is a rating indicating a component's susceptibility to damage due to absorbed moisture during storage. Damages of the connector after storage in damp heat and three times soldering are not permitted (e.g. blisters).

The *har*-flex® connectors are rated with **PSL R0** and **MSL 1**. This is the maximum possible rating in both categories. The *har*-flex® connector resists three times soldering at the following conditions without damages:

- min. 150 s beyond 217 °C (liquidus temperature, the melting point of the solder paste)
- min. 30 s beyond classification temperature (240 °C / 245 °C for *har*-flex®)
- Temperature solder profile according to ECA/IPC/JEDEC J-STD-075
- For MSL test, a storage of 168 hours at 85 °C and 85 % rel. humidity was carried out

As the result, the *har*-flex® connectors are not process sensitive and not moisture sensitive according to ECA/IPC/JEDEC J-STD-075.

available Q2 / 2012



Male connectors, angled

Identification	Number of contacts	Part No.
Male connector, angled	6	15 15 006 . 601 . . .
	8	15 15 008 . 601 . . .
	10	15 15 010 . 601 . . .
	12	15 15 012 . 601 . . .
	14	15 15 014 . 601 . . .
	16	15 15 016 . 601 . . .
	18	15 15 018 . 601 . . .
	20	15 15 020 . 601 . . .
	22	15 15 022 . 601 . . .
	24	15 15 024 . 601 . . .
	26	15 15 026 . 601 . . .
	28	15 15 028 . 601 . . .
	30	15 15 030 . 601 . . .
	32	15 15 032 . 601 . . .
	34	15 15 034 . 601 . . .
	36	15 15 036 . 601 . . .
	38	15 15 038 . 601 . . .
	40	15 15 040 . 601 . . .
	42	15 15 042 . 601 . . .
	44	15 15 044 . 601 . . .
	46	15 15 046 . 601 . . .
	48	15 15 048 . 601 . . .
	50	15 15 050 . 601 . . .
	52	15 15 052 . 601 . . .
	54	15 15 054 . 601 . . .
	56	15 15 056 . 601 . . .
	58	15 15 058 . 601 . . .
	60	15 15 060 . 601 . . .
	62	15 15 062 . 601 . . .
	64	15 15 064 . 601 . . .
	66	15 15 066 . 601 . . .
	68	15 15 068 . 601 . . .
	70	15 15 070 . 601 . . .
	72	15 15 072 . 601 . . .
	74	15 15 074 . 601 . . .
	76	15 15 076 . 601 . . .
	78	15 15 078 . 601 . . .
	80	15 15 080 . 601 . . .
	82	15 15 082 . 601 . . .
	84	15 15 084 . 601 . . .
	86	15 15 086 . 601 . . .
	88	15 15 088 . 601 . . .
	90	15 15 090 . 601 . . .
	92	15 15 092 . 601 . . .
	94	15 15 094 . 601 . . .
	96	15 15 096 . 601 . . .
	98	15 15 098 . 601 . . .
	100	15 15 100 . 601 . . .

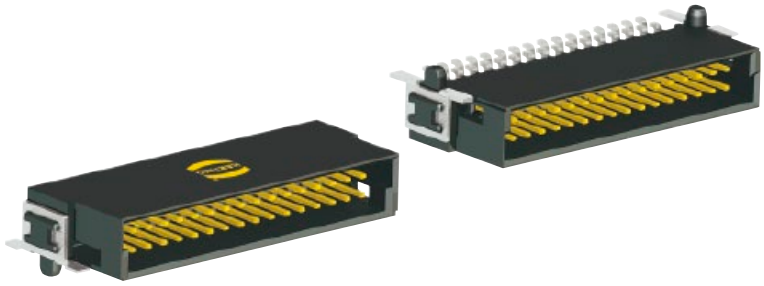
Dimensions in mm

A	B	C	D	E
2.54	6.96	8.89	5.76	4.76
3.81	8.23	10.16	7.03	6.03
5.08	9.50	11.43	8.30	7.30
6.35	10.77	12.70	9.57	8.57
7.62	12.04	13.97	10.84	9.84
8.89	13.31	15.24	12.11	11.11
10.16	14.58	16.51	13.38	12.38
11.43	15.85	17.78	14.65	13.65
12.70	17.12	19.05	15.92	14.92
13.97	18.39	20.32	17.19	16.19
15.24	19.66	21.59	18.46	17.46
16.51	20.93	22.86	19.73	18.73
17.78	22.20	24.13	21.00	20.00
19.05	23.47	25.40	22.27	21.27
20.32	24.74	26.67	23.54	22.54
21.59	26.01	27.94	24.81	23.81
22.86	27.28	29.21	26.08	25.08
24.13	28.55	30.48	27.35	26.35
25.40	29.82	31.75	28.62	27.62
26.67	31.09	33.02	29.89	28.89
27.94	32.36	34.29	31.16	30.16
29.21	33.63	35.56	32.43	31.43
30.48	34.90	36.83	33.70	32.70
31.75	36.17	38.10	34.97	33.97
33.02	37.44	39.37	36.24	35.24
34.29	38.71	40.64	37.51	36.51
35.56	39.98	41.91	38.78	37.78
36.83	41.25	43.18	40.05	39.05
38.10	42.52	44.45	41.32	40.32
39.37	43.79	45.72	42.59	41.59
40.64	45.06	46.99	43.86	42.86
41.91	46.33	48.26	45.13	44.13
43.18	47.60	49.53	46.40	45.40
44.45	48.87	50.80	47.67	46.67
45.72	50.14	52.07	48.94	47.94
46.99	51.41	53.34	50.21	49.21
48.26	52.68	54.61	51.48	50.48
49.53	53.95	55.88	52.75	51.75
50.80	55.22	57.15	54.02	53.02
52.07	56.49	58.42	55.29	54.29
53.34	57.76	59.69	56.56	55.56
54.61	59.03	60.96	57.83	56.83
55.88	60.30	62.23	59.10	58.10
57.15	61.57	63.50	60.37	59.37
58.42	62.84	64.77	61.64	60.64
59.69	64.11	66.04	62.91	61.91
60.96	65.38	67.31	64.18	63.18
62.23	66.65	68.58	65.45	64.45

for performance level 1 2
for performance level S4 5
for performance level 2 6

333 000 for samples
for 560 pieces on reel

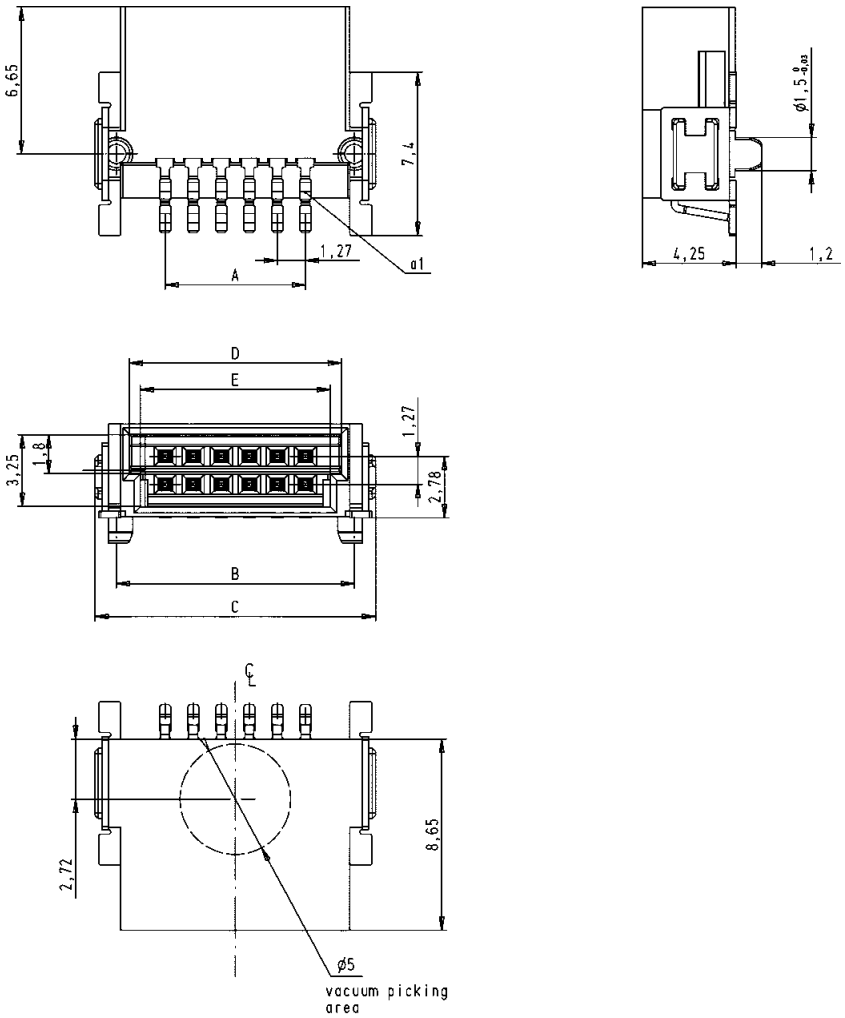
available Q2 / 2012



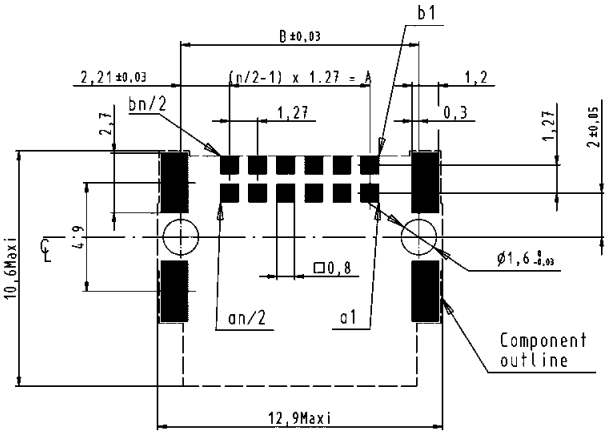
Male connectors, angled

Identification	Drawing	Dimensions in mm

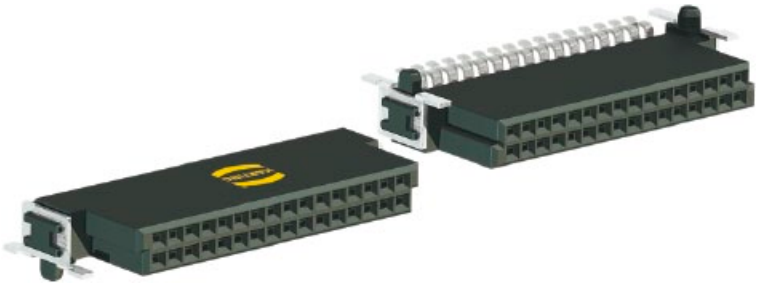
Dimensions



PCB layout



available Q2 / 2012



Female connectors, angled

Identification	Number of contacts	Part No.	Dimensions in mm

Female connector, angled

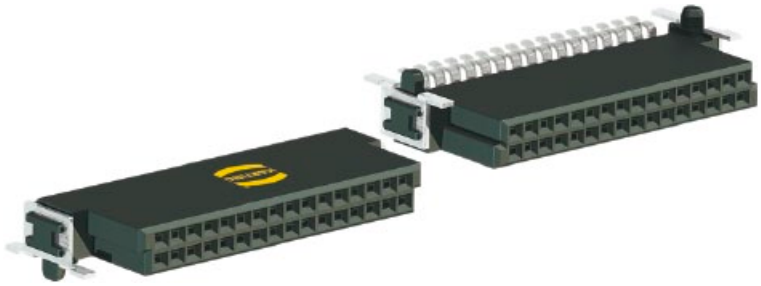
Number of contacts	Part No.
6	15 25 006 . 601 . . .
8	15 25 008 . 601 . . .
10	15 25 010 . 601 . . .
12	15 25 012 . 601 . . .
14	15 25 014 . 601 . . .
16	15 25 016 . 601 . . .
18	15 25 018 . 601 . . .
20	15 25 020 . 601 . . .
22	15 25 022 . 601 . . .
24	15 25 024 . 601 . . .
26	15 25 026 . 601 . . .
28	15 25 028 . 601 . . .
30	15 25 030 . 601 . . .
32	15 25 032 . 601 . . .
34	15 25 034 . 601 . . .
36	15 25 036 . 601 . . .
38	15 25 038 . 601 . . .
40	15 25 040 . 601 . . .
42	15 25 042 . 601 . . .
44	15 25 044 . 601 . . .
46	15 25 046 . 601 . . .
48	15 25 048 . 601 . . .
50	15 25 050 . 601 . . .
52	15 25 052 . 601 . . .
54	15 25 054 . 601 . . .
56	15 25 056 . 601 . . .
58	15 25 058 . 601 . . .
60	15 25 060 . 601 . . .
62	15 25 062 . 601 . . .
64	15 25 064 . 601 . . .
66	15 25 066 . 601 . . .
68	15 25 068 . 601 . . .
70	15 25 070 . 601 . . .
72	15 25 072 . 601 . . .
74	15 25 074 . 601 . . .
76	15 25 076 . 601 . . .
78	15 25 078 . 601 . . .
80	15 25 080 . 601 . . .
82	15 25 082 . 601 . . .
84	15 25 084 . 601 . . .
86	15 25 086 . 601 . . .
88	15 25 088 . 601 . . .
90	15 25 090 . 601 . . .
92	15 25 092 . 601 . . .
94	15 25 094 . 601 . . .
96	15 25 096 . 601 . . .
98	15 25 098 . 601 . . .
100	15 25 100 . 601 . . .

A	B	C	D	E
2.54	6.96	8.89	5.56	4.56
3.81	8.23	10.16	6.83	5.83
5.08	9.50	11.43	8.10	7.10
6.35	10.77	12.70	9.37	8.37
7.62	12.04	13.97	10.64	9.64
8.89	13.31	15.24	11.91	10.91
10.16	14.58	16.51	13.18	12.18
11.43	15.85	17.78	14.45	13.45
12.70	17.12	19.05	15.72	14.72
13.97	18.39	20.32	16.99	15.99
15.24	19.66	21.59	18.26	17.26
16.51	20.93	22.86	19.53	18.53
17.78	22.20	24.13	20.80	19.80
19.05	23.47	25.40	22.07	21.07
20.32	24.74	26.67	23.34	22.34
21.59	26.01	27.94	24.61	23.61
22.86	27.28	29.21	25.88	24.88
24.13	28.55	30.48	27.15	26.15
25.40	29.82	31.75	28.42	27.42
26.67	31.09	33.02	29.69	28.69
27.94	32.36	34.29	30.96	29.96
29.21	33.63	35.56	32.23	31.23
30.48	34.90	36.83	33.50	32.50
31.75	36.17	38.10	34.77	33.77
33.02	37.44	39.37	36.04	35.04
34.29	38.71	40.64	37.31	36.31
35.56	39.98	41.91	38.58	37.58
36.83	41.25	43.18	39.85	38.85
38.10	42.52	44.45	41.12	40.12
39.37	43.79	45.72	42.39	41.39
40.64	45.06	46.99	43.66	42.66
41.91	46.33	48.26	44.93	43.93
43.18	47.60	49.53	46.20	45.20
44.45	48.87	50.80	47.47	46.47
45.72	50.14	52.07	48.74	47.74
46.99	51.41	53.34	50.01	49.01
48.26	52.68	54.61	51.28	50.28
49.53	53.95	55.88	52.55	51.55
50.80	55.22	57.15	53.82	52.82
52.07	56.49	58.42	55.09	54.09
53.34	57.76	59.69	56.36	55.36
54.61	59.03	60.96	57.63	56.63
55.88	60.30	62.23	58.90	57.90
57.15	61.57	63.50	60.17	59.17
58.42	62.84	64.77	61.44	60.44
59.69	64.11	66.04	62.71	61.71
60.96	65.38	67.31	63.98	62.98
62.23	66.65	68.58	65.25	64.25

for performance level 1 2
for performance level S4 5
for performance level 2 6

333 000 for samples
for 560 pieces on reel

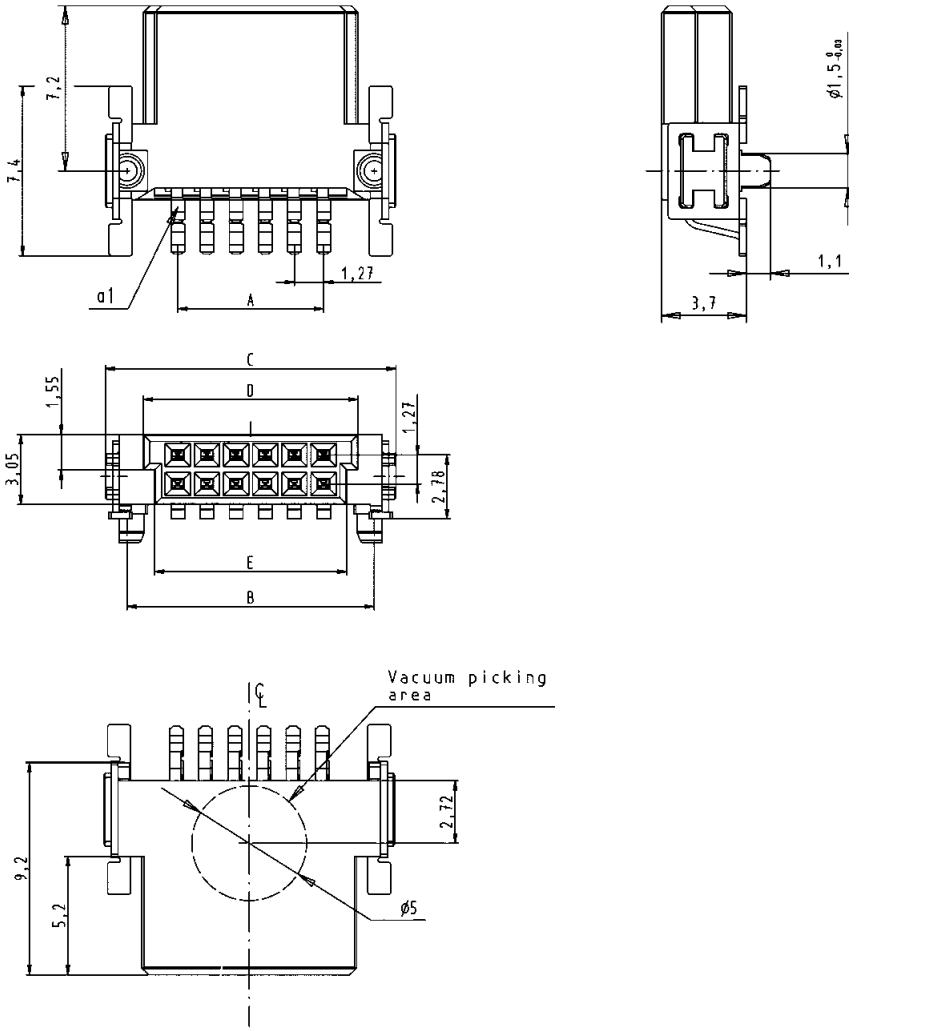
available Q2 / 2012



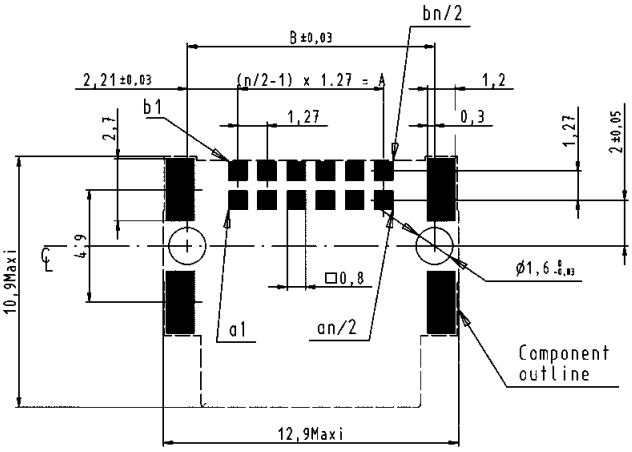
Female connectors, angled

Identification	Drawing	Dimensions in mm

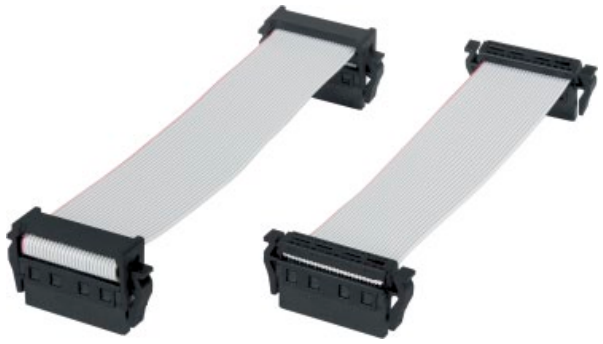
Dimensions

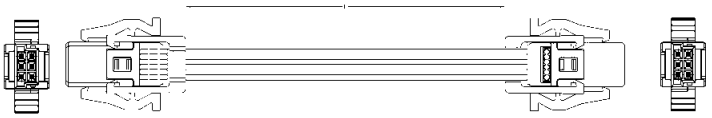
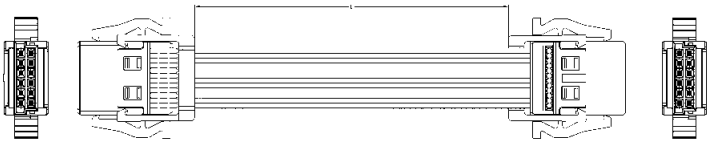
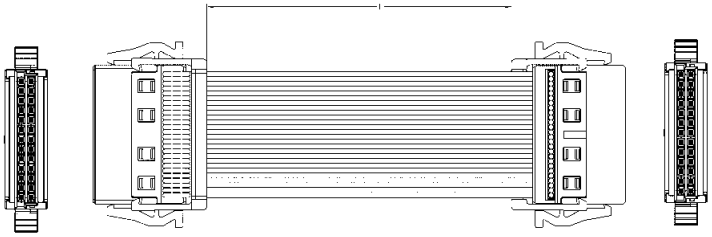


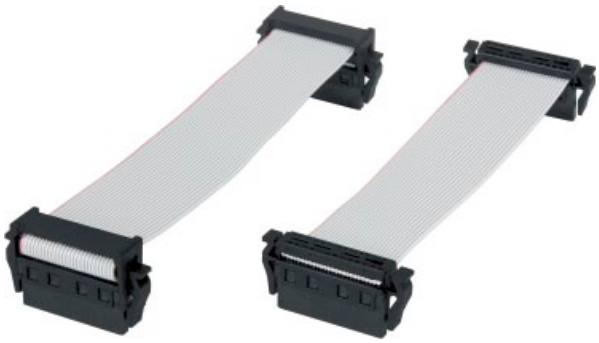
PCB layout



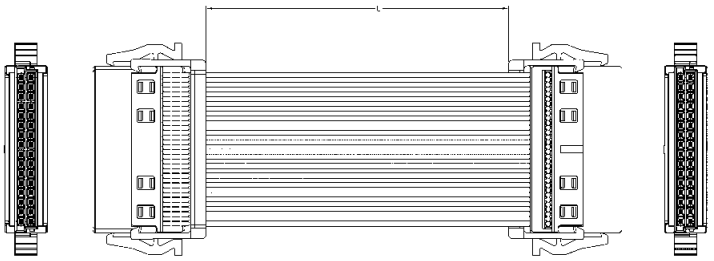
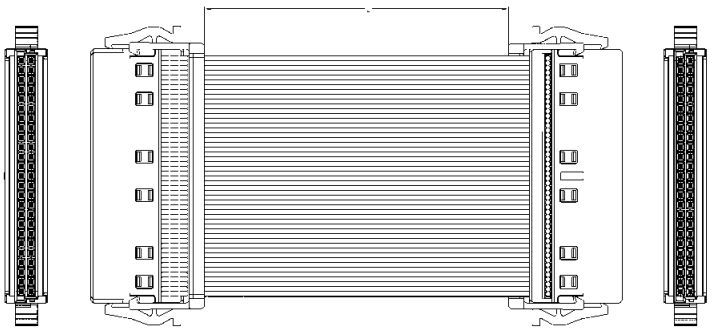
Cable assemblies



Identification	Part No.	Drawing	Dimensions in mm
Cable assembly *har*-flex® 6 pole Cable: Flat cable, 6 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m L = 0.2 m L = 0.5 m	33 15 243 0100 001 33 15 243 0200 002 33 15 243 0500 003		
Cable assembly *har*-flex® 12 pole Cable: Flat cable, 12 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m L = 0.2 m L = 0.5 m	33 15 243 0100 004 33 15 243 0200 005 33 15 243 0500 006		
Cable assembly *har*-flex® 26 pole Cable: Flat cable, 26 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m L = 0.2 m L = 0.5 m	33 15 243 0100 007 33 15 243 0200 008 33 15 243 0500 009		

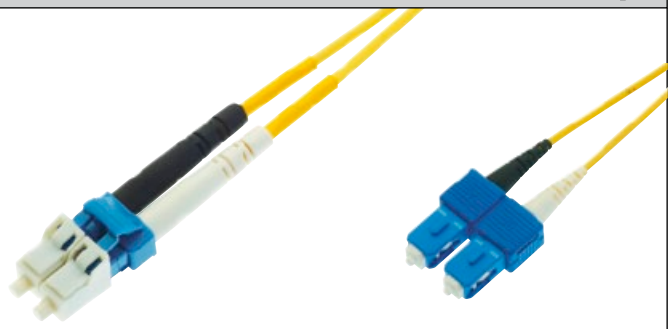


Cable assemblies

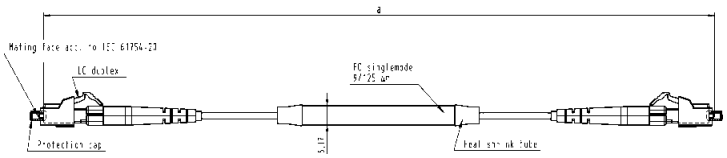
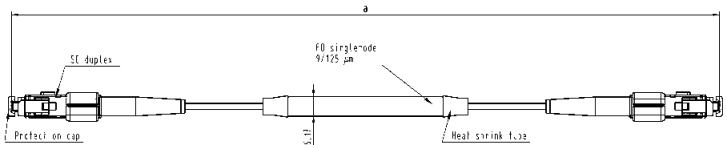
Identification	Part No.	Drawing	Dimensions in mm
Cable assembly *har*-flex® 32 pole Cable: Flat cable, 32 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m	33 15 243 0100 010		
L = 0.2 m	33 15 243 0200 011		
L = 0.5 m	33 15 243 0500 012		
Cable assembly *har*-flex® 50 pole Cable: Flat cable, 50 wires, AWG 30, 0.635 mm pitch Wiring: 1:1 Connectors with strain relief			
Length: L = 0.1 m	33 15 243 0100 013		
L = 0.2 m	33 15 243 0200 014		
L = 0.5 m	33 15 243 0500 015		

Fibre Optic

Identification	Part No.	Drawing	Dimensions in mm
Fibre optic jumper cable 2 x LC duplex Multi Mode 50/125 µm			
Length: a = 1 m	33 01 241 0010 005		
a = 2 m	33 01 241 0020 005		
a = 3 m	33 01 241 0030 005		
a = 4 m	33 01 241 0040 005		
a = 5 m	33 01 241 0050 005		
a = 6 m	33 01 241 0060 005		
a = 7 m	33 01 241 0070 005		
a = 8 m	33 01 241 0080 005		
a = 9 m	33 01 241 0090 005		
a = 10 m	33 01 241 0100 005		
Fibre optic jumper cable 2 x SC duplex Multi Mode 50/125 µm			
Length: a = 1 m	33 01 241 0010 006		
a = 2 m	33 01 241 0020 006		
a = 3 m	33 01 241 0030 006		
a = 4 m	33 01 241 0040 006		
a = 5 m	33 01 241 0050 006		
a = 6 m	33 01 241 0060 006		
a = 7 m	33 01 241 0070 006		
a = 8 m	33 01 241 0080 006		
a = 9 m	33 01 241 0090 006		
a = 10 m	33 01 241 0100 006		
Fibre optic jumper cable 2 x ST duplex Multi Mode 50/125 µm			
Length: a = 1 m	33 01 241 0010 007		
a = 2 m	33 01 241 0020 007		
a = 3 m	33 01 241 0030 007		
a = 4 m	33 01 241 0040 007		
a = 5 m	33 01 241 0050 007		
a = 6 m	33 01 241 0060 007		
a = 7 m	33 01 241 0070 007		
a = 8 m	33 01 241 0080 007		
a = 9 m	33 01 241 0090 007		
a = 10 m	33 01 241 0100 007		



Fibre Optic

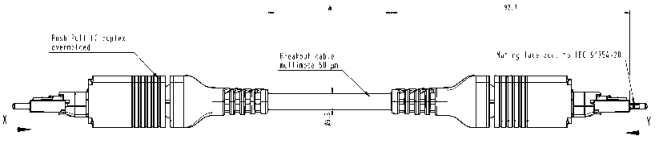
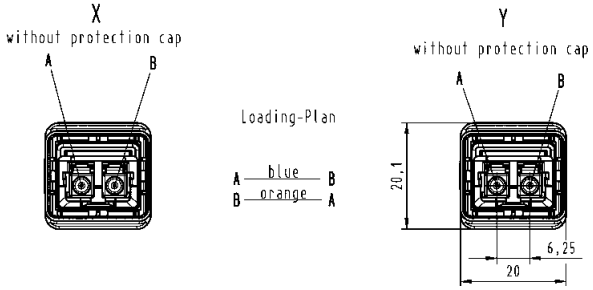
Identification	Part No.	Drawing	Dimensions in mm
Fibre optic jumper cable 2 x LC duplex Single Mode 9/125 µm			
Length: a = 1 m	33 01 241 0010 008		
a = 2 m	33 01 241 0020 008		
a = 3 m	33 01 241 0030 008		
a = 4 m	33 01 241 0040 008		
a = 5 m	33 01 241 0050 008		
a = 6 m	33 01 241 0060 008		
a = 7 m	33 01 241 0070 008		
a = 8 m	33 01 241 0080 008		
a = 9 m	33 01 241 0090 008		
a = 10 m	33 01 241 0100 008		
Fibre optic jumper cable 2 x SC duplex Single Mode 9/125 µm			
Length: a = 1 m	33 01 241 0010 009		
a = 2 m	33 01 241 0020 009		
a = 3 m	33 01 241 0030 009		
a = 4 m	33 01 241 0040 009		
a = 5 m	33 01 241 0050 009		
a = 6 m	33 01 241 0060 009		
a = 7 m	33 01 241 0070 009		
a = 8 m	33 01 241 0080 009		
a = 9 m	33 01 241 0090 009		
a = 10 m	33 01 241 0100 009		

HARTING PushPull LC duplex

Identification	Part No.	Drawing	Dimensions in mm
Fibre optic cable, double ended, single mode overmolded		double ended	
Length: a = 1 m	33 58 231 0010 015		
a = 5 m	33 58 231 0050 015		
a = 10 m	33 58 231 0100 015	a = length	
a = 20 m	33 58 231 0200 015		
a = 40 m	33 58 231 0400 015		
a = 50 m	33 58 231 0500 015		
a = 60 m	33 58 231 0600 015		
a = 100 m	33 58 231 1000 015		
a = 300 m	33 58 231 3000 015		
Fibre optic breakout cable, single mode		PUR jacket 2-fibre single mode Outer diameter: 6.5 mm Min. bending radius: Installation: 10.4 cm Operating: 5.2 cm	
Length: 10 m	33 58 751 0100 002		
Length: 20 m	33 58 751 0200 002		
Length: 100 m	33 58 751 1000 002		

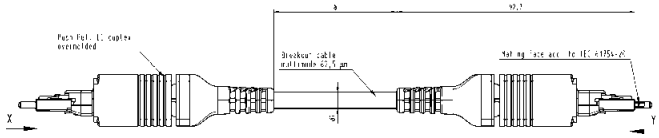
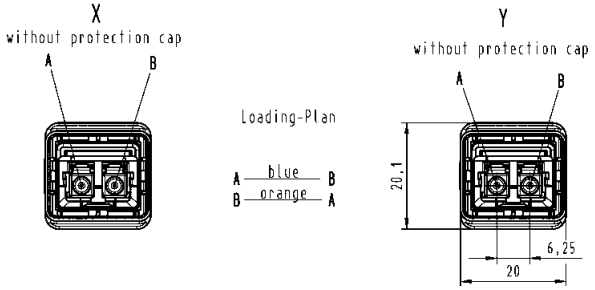
Further cable lengths are available on request

HARTING PushPull LC duplex

Identification	Part No.	Drawing	Dimensions in mm
Fibre optic cable, double ended, multi mode, 50 µm overmolded		double ended	
Length: a = 1 m	33 58 231 0010 017		
a = 5 m	33 58 231 0050 017	a = length	
a = 10 m	33 58 231 0100 017		
a = 20 m	33 58 231 0200 017		
a = 40 m	33 58 231 0400 017		
a = 50 m	33 58 231 0500 017		
a = 60 m	33 58 231 0600 017		
a = 100 m	33 58 231 1000 017		
a = 300 m	33 58 231 3000 017		
Fibre optic breakout cable, multi mode			PUR jacket 2-fibre multi mode 50 µm Outer diameter: 6.5 mm Min. bending radius: Installation: 10.4 cm Operating: 5.2 cm
Length: 10 m	33 58 751 0100 003		
Length: 20 m	33 58 751 0200 003		
Length: 100 m	33 58 751 1000 003		

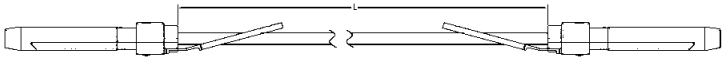
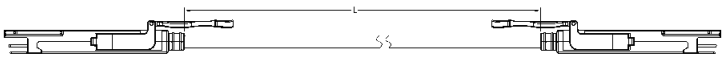
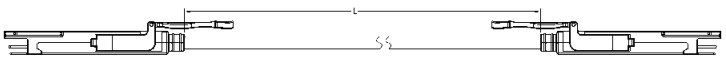
Further cable lengths are available on request

HARTING PushPull LC duplex

Identification	Part No.	Drawing	Dimensions in mm
Fibre optic cable, double ended, multi mode, 62.5 µm overmolded		double ended	
Length: a = 1 m	33 58 231 0010 016		
a = 5 m	33 58 231 0050 016	a = length	
a = 10 m	33 58 231 0100 016		
a = 20 m	33 58 231 0200 016		
a = 40 m	33 58 231 0400 016		
a = 50 m	33 58 231 0500 016		
a = 60 m	33 58 231 0600 016		
a = 100 m	33 58 231 1000 016		
a = 300 m	33 58 231 3000 016		
Fibre optic breakout cable, multi mode, 62.5 µm			
Length: 10 m	33 58 751 0100 001	PUR jacket 2-fibre multi mode 62.5 µm Outer diameter: 7 mm Min. bending radius: Installation: 10.5 cm Operating: 7.0 cm	
Length: 20 m	33 58 751 0200 001		
Length: 100 m	33 58 751 1000 001		

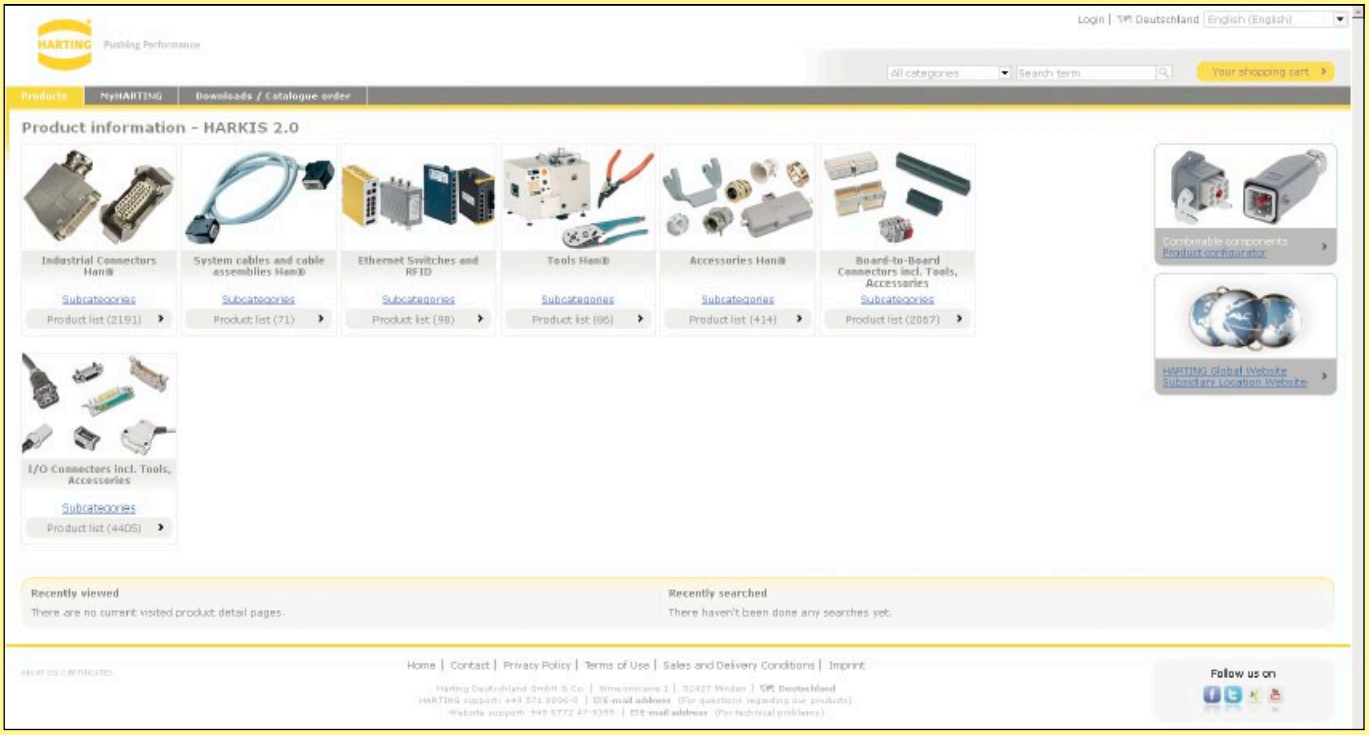
Further cable lengths are available on request

High speed SFP+ / QSFP+

Identification	Part No.	Drawing	Dimensions in mm
Cable assembly SFP+ Cable: 2 pair twinax, AWG 28, PVC Wiring according to SFF 8431			
Length: L = 0.5 m	33 72 211 0050 015		
L = 1.0 m	33 72 211 0100 016		
L = 1.5 m	33 72 211 0150 017		
Cable assembly QSFP+ Cable: 8 pair twinax, AWG 30, PVC Wiring according to SFF 8436			
Length: L = 0.5 m	33 74 211 0050 010		
L = 1.0 m	33 74 211 0100 011		
L = 1.5 m	33 74 211 0150 012		
Cable assembly QSFP+ Cable: 8 pair twinax, AWG 26, PVC Wiring according to SFF 8436			
Length: L = 0.5 m	33 76 211 0050 007		
L = 1.0 m	33 76 211 0100 008		
L = 1.5 m	33 76 211 0150 009		

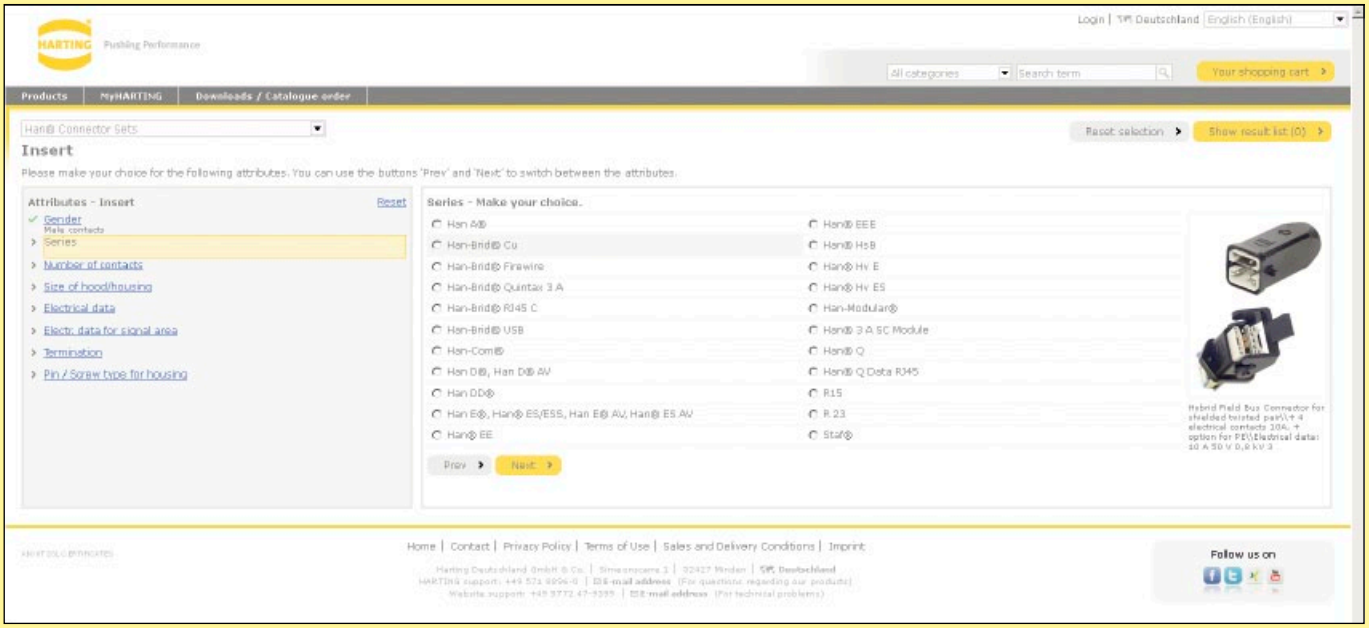
Notes

You can find the **HARTING eCatalogue** at **www.HARTING.com**.



The **HARTING eCatalogue** is an electronic catalogue with a product configurator. Here you can choose a connector according to your requirements. Afterwards you are able to send your inquiry directly to a HARTING sales partner. The drawings to every single part are available in PDF format. The parts are downloadable in 2D format (DXF) and 3D format (IGES, STEP). The 3D models can be viewed with a VRML-viewer.

Product configurator



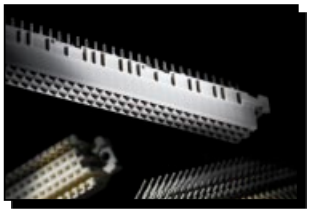
Catalogue order information

Please send me further information:

☐ **Interface Connectors**

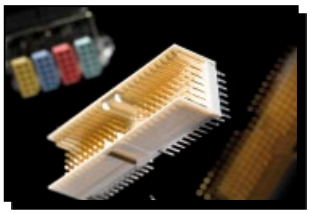
☐ **Device Connectivity**

☐ **Industrial Connectors Han®**



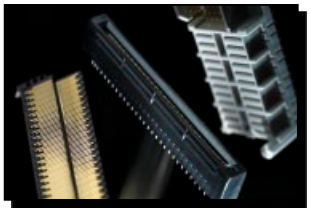
☐ **Connectors DIN 41 612**

☐ **Intelligent Network Solutions**

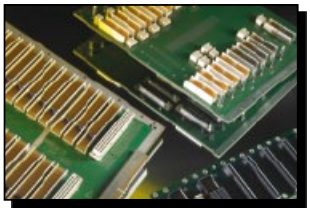


☐ **Coaxial and Metric Connectors**

☐ **Application brochure**



☐ **TCA Connectors**



☐ **High Speed Backplanes**

Sender:

Company: _____ Street: _____

Department: _____ Postcode/Town: _____

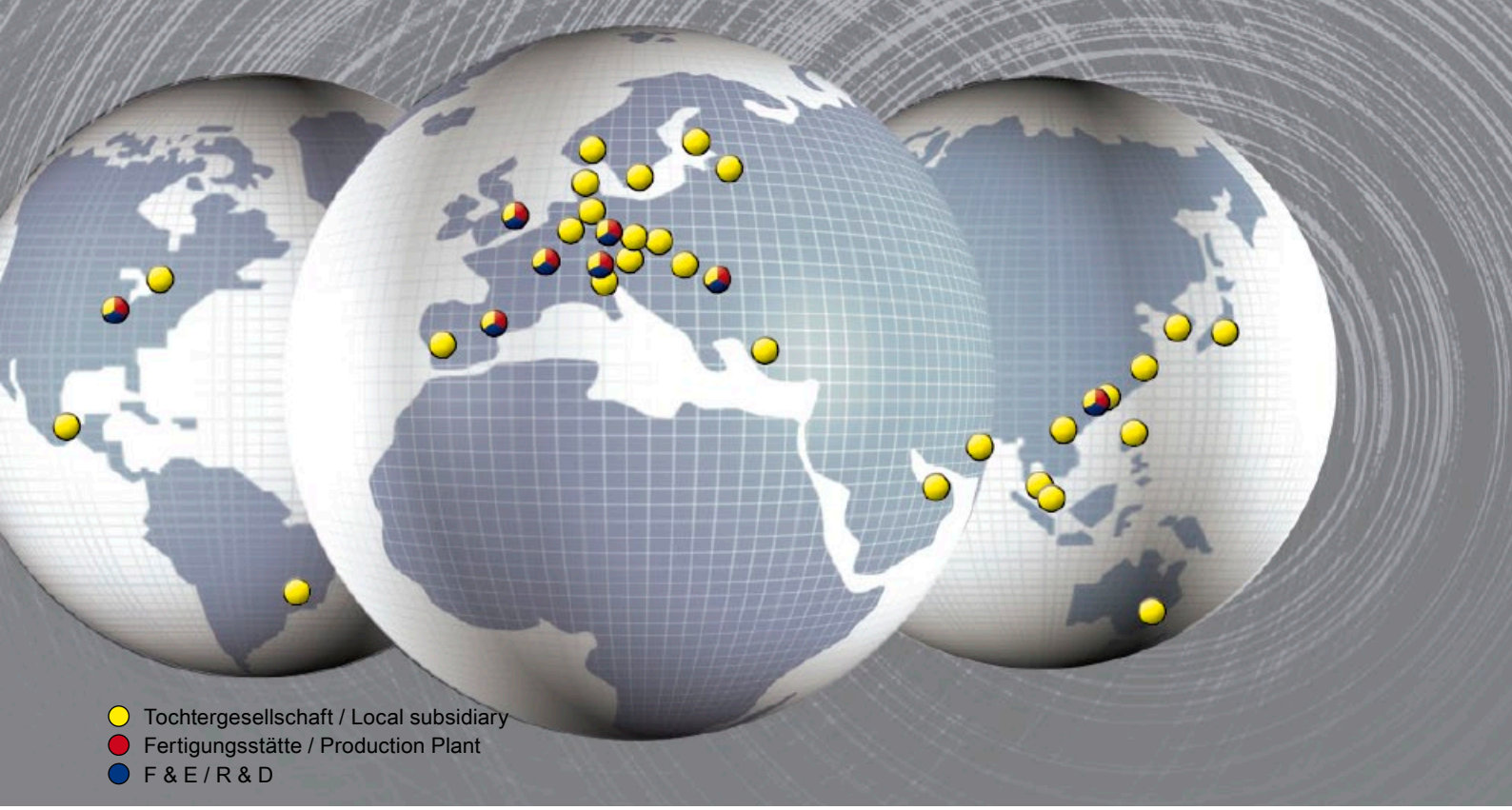
Name: _____ Country: _____

Prename: _____ Phone: _____

Function: _____ Fax: _____

E-Mail: _____

Please send it by post or fax to your local HARTING representatives (see page addresses) or visit us under www.HARTING.com.



Sales Network – worldwide

Albania
see Eastern Europe

Argentina
Condelectric S.A.
Hipólito Yrigoyen 2591, 1640 - Martínez
Buenos Aires – Argentina
Phone +54 11 4836 1053
Fax +54 11 4836 1053
comercial@condelectric.com.ar

Armenia
see Eastern Europe

Australia
HARTING Pty Ltd
Suite 11 / 2 Enterprise Drive
Bundoora 3083, AUS-Victoria
Phone +61 3 9466 7088
Fax +61 3 9466 7099
au@HARTING.com
www.HARTING.com.au

Austria
HARTING Ges.m.b.H.
Deutschstraße 19, A-1230 Wien
Phone +431 6162121
Fax +431 6162121-21
at@HARTING.com
www.HARTING.at

Azerbaijan
see Eastern Europe

Bahrain
see United Arab Emirates

Belarus
see Eastern Europe

Belgium
HARTING N.V./S.A.
Z.3 Doornveld 23, B-1731 Zellik
Phone +32 2 466 0190
Fax +32 2 466 7855
be@HARTING.com
www.HARTING.be

Bosnia and Herzegovina
see Eastern Europe

Brazil
HARTING Ltda.
Rua Major Paladino 128; Prédio 11
CEP 05307-000 São Paulo
SP – Brazil
Phone +55 11 5035 0073
Fax +55 11 5034 4743
br@HARTING.com
www.HARTING.com.br

Brunei
see Singapore

Bulgaria
see Eastern Europe

Canada
HARTING Canada Inc.
8455 Trans-Canada Hwy., Suite 202
St. Laurent, QC, H4S1Z1, Canada
Phone 855-659-6653
Fax 855-659-6654
info.ca@HARTING.com
www.HARTING.ca

China
HARTING Sales (Shanghai) Limited
Room 5403, HK New World Tower
300 Huai Hai Road (M.), Luwan District
Shanghai 200021, China
Phone +86 21 6386 2200
Fax +86 21 6386 8636
cn@HARTING.com
www.HARTING.com.cn

Croatia
see Eastern Europe

Czech Republic
HARTING s.r.o.
Mlýnská 2, CZ-160 00 Praha 6
Phone +420 220 380 460
Fax +420 220 380 461
cz@HARTING.com
www.HARTING.cz

Denmark
HARTING ApS
Hjulmagervej 4a
DK - 7100 Vejle
Phone +45 70 25 00 32
Fax +45 75 80 64 99
dk@HARTING.com
www.HARTING.com

Eastern Europe
HARTING Eastern Europe GmbH
Bamberger Straße 7
D-01187 Dresden
Phone +49 351 4361 760
Fax +49 351 436 1770
Eastern.Europe@HARTING.com
www.HARTING.com

Estonia
see Eastern Europe

Finland
HARTING Oy
Teknobulevardi 3-5
FI-01530 Vantaa
Phone +358 207 291 510
Fax +358 207 291 511
fi@HARTING.com
www.HARTING.fi

France
HARTING France
181 avenue des Nations, Paris Nord 2
BP 66058 Tremblay en France
F-95972 Roissy Charles de Gaulle Cédex
Phone +33 1 4938 3400
Fax +33 1 4863 2306
fr@HARTING.com
www.HARTING.fr

Germany
HARTING Deutschland GmbH & Co. KG
P.O. Box 2451, D-32381 Minden
Simeonscarré 1, D-32427 Minden
Phone +49 571 8896 0
Fax +49 571 8896 282
de@HARTING.com
www.HARTING-Deutschland.de

Georgia
see Eastern Europe

Great Britain
HARTING Ltd., Caswell Road
Brackmills Industrial Estate
GB-Northampton, NN4 7PW
Phone +44 1604 827 500
Fax +44 1604 706 777
gb@HARTING.com
www.HARTING.co.uk

Hong Kong
HARTING (HK) Limited
Regional Office Asia Pacific
3512 Metroplaza Tower 1
223 Hing Fong Road
Kwai Fong, N. T., Hong Kong
Phone +852 2423 7338
Fax +852 2480 4378
ap@HARTING.com
www.HARTING.com.hk

Hungary
HARTING Magyarország Kft.
Fehérvári út 89-95, H-1119 Budapest
Phone +36 1 205 34 64
Fax +36 1 205 34 65
hu@HARTING.com
www.HARTING.hu

Iceland
Smith & Norland, Nóatún 4
IS – 105 Reykjavík
Phone +354 520 3000
Fax +354 520 3011
olaf@sminor.is, www.sminor.is

India
HARTING India Private Limited
No. D, 4th Floor, ‚Doshi Towers'
No. 156 Poonamallee High Road
Kilpauk, Chennai 600 010
Tamil Nadu, India
Phone +91 44 435604 15 / 416
Fax +91 44 435604 17
in@HARTING.com
www.HARTING.in

Indonesia
see Malaysia

Israel
COMTEL
Israel Electronic Solutions Ltd.
Bet Hapamon, 20 Hataas st.
P.O.Box 66
Kefar-Saba 44425
Phone +972-9-7677240
Fax +972-9-7677243
sales@comtel.co.il
www.comtel.co.il

Italy
HARTING SpA
Via Dell' Industria 7
I-20090 Vimodrone (Milano)
Phone +39 02 250801
Fax +39 02 2650 597
it@HARTING.com
www.HARTING.it

Japan
HARTING K. K.
Yusen Shin-Yokohama 1 Chome Bldg., 2F
1-7-9, Shin-Yokohama, Kohoku
Yokohama 222-0033 Japan
Phone +81 45 476 3456
Fax +81 45 476 3466
jp@HARTING.com
www.HARTING.co.jp

Jordan
see United Arab Emirates

Kazakhstan
see Eastern Europe

Kirghizia
see Eastern Europe

Korea (South)
HARTING Korea Limited
#308 Yatap Leaders Building
342-1, Yatap-dong, Bundang-gu
Sungnam-City, Kyunggi-do
463-828, Republic of Korea
Phone +82 31 781 4615
Fax +82 31 781 4616
kr@HARTING.com
www.HARTING.co.kr

Kosovo
see Eastern Europe

Kuwait
see United Arab Emirates

Latvia
see Eastern Europe

Lithuania
see Eastern Europe

Macedonia
see Eastern Europe

Malaysia (Office)
HARTING Singapore Pte Ltd
Malaysia Branch
11-02 Menara Amcorp
Jln. Persiaran Barat
46200 PJ, Sel. D. E., Malaysia
Phone +60 3 / 7955 6173
Fax +60 3 / 7955 5126
sg@HARTING.com

Montenegro
see Eastern Europe

Netherlands
HARTING B.V.
Larenweg 44
NL-5234 KA ‚s-Hertogenbosch
Postbus 3526
NL-5203 DM ‚s-Hertogenbosch
Phone +31 736 410 404
Fax +31 736 440 699
nl@HARTING.com
www.HARTINGbv.nl

New Zealand
see Australia

Norway
HARTING A/S
Østensjøveien 36, N-0667 Oslo
Phone +47 22 700 555
Fax +47 22 700 570
no@HARTING.com
www.HARTING.no

Oman
see United Arab Emirates

Pakistan
see United Arab Emirates

Philippines
see Malaysia

Sales Network – worldwide

Poland
HARTING Polska Sp. z o.o.
ul. Duńska 9, Budynek DELTA
PL-54-427 Wrocław
Phone +48 71 352 81 71
pl@HARTING.com
www.HARTING.pl

Portugal
HARTING Iberia, S. A.
Avda. Josep Tarradellas 20-30 4º 6a
E-08029 Barcelona
Phone +351 219 673 177
Fax +351 219 678 457
es@HARTING.com
www.HARTING.es/pt

Qatar
see United Arab Emirates

Republic of Moldova
see Eastern Europe

Romania
HARTING Romania SCS
Europa Unita str. 21
550018-Sibiu, Romania
Phone +40 369-102 671
Fax +40 369-102 622
ro@HARTING.com
www.HARTING.com

Russia
HARTING ZAO
Maliy Sampsoniyevsky prospect 2A
194044 Saint Petersburg, Russia
Phone +7 812 327 6477
Fax +7 812 327 6478
ru@HARTING.com
www.HARTING.ru

Saudi Arabia
see United Arab Emirates

Serbia
see Eastern Europe

Singapore
HARTING Singapore Pte Ltd.
25 International Business Park
#04-108 German Centre
Singapore 609916
Phone +65 6225 5285
Fax +65 6225 9947
sg@HARTING.com
www.HARTING.sg

Slovakia
HARTING s.r.o.
Sales office Slovakia
J. Simora 5, SK - 940 52 Nové Zámky
Phone +421 356-493 993
Fax +421 356-402 114
sk@HARTING.com
www.HARTING.sk

Slovenia
see Eastern Europe

South Africa
HellermannTyton Pty Ltd.
Private Bag X158 Rivonia 2128
34 Milky Way Avenue
Linbro Business Park 2065
Johannesburg
Phone +27(0)11879-6600
Fax +27(0)11879-6606
sales.jhb@hellermann.co.za

Spain
HARTING Iberia S.A.
Avda. Josep Tarradellas 20-30 4º 6ª
E-08029 Barcelona
Phone +34 93 363 84 75
Fax +34 93 419 95 85
es@HARTING.com
www.HARTING.es

Sweden
HARTING AB
Gustavslundsvägen 141 B 4tr
S-167 51 Bromma
Phone +46 8 445 7171
Fax +46 8 445 7170
se@HARTING.com
www.HARTING.se

Switzerland
HARTING AG
Industriestrasse 26
CH-8604 Volketswil
Phone +41 44 908 20 60
Fax +41 44 908 20 69
ch@HARTING.com
www.HARTING.ch

Taiwan
HARTING Taiwan Ltd.
Room 1, 5/F
495 GuangFu South Road
RC-110 Taipei, Taiwan
Phone +886 2 2758 6177
Fax +886 2 2758 7177
tw@HARTING.com
www.HARTING.com.tw

Tajikistan
see Eastern Europe

Thailand
see Malaysia

Turkey
HARTING TURKEI Elektronik Ltd. Şti.
Barbaros Mah. Dereboyu Cad.
Fesleğen Sok.
Uphill Towers, A-1b Kat:8 D:45
34746 Ataşehir, İstanbul
Phone +90 216 688 81 00
Fax +90 216 688 81 01
tr@HARTING.com
www.HARTING.com.tr

Turkmenistan
see Eastern Europe

Ukraine
see Eastern Europe

United Arab Emirates
HARTING Middle East FZ-LLC
Knowledge Village, Block 2A, Office F72
P.O. Box 454372, Dubai
United Arab Emirates
Phone +971 4 453 9737
Fax +971 4 439 0339
uae@HARTING.com
www.HARTING.ae

USA
HARTING Inc. of North America
1370 Bowes Road
USA-Elgin, Illinois 60123
Phone +1 (877) 741-1500 (toll free)
Fax +1 (866) 278-0307 (Inside Sales)
us@HARTING.com
www.HARTING-USA.com

Uzbekistan
see Eastern Europe

Vietnam
see Singapore

Distributors – worldwide

Farnell:
www.farnell.com

RS Components:
www.rs-components.com

FUTURE Electronics:
www.futureelectronics.com

Mouser Electronics:
www.mouser.com

Other countries and general contact

HARTING Electric GmbH & Co. KG
P.O. Box 1473, D-32328 Espelkamp
Phone +49 5772 47-97100
Fax +49 5772 47-495
electric@HARTING.com

HARTING Electronics GmbH & Co. KG
P.O. Box 1433, D-32328 Espelkamp
Phone +49 5772/47-97200
Fax +49 5772/47-777
electronics@HARTING.com

Pushing Performance

www.HARTING.com

MO/2012-04-12/6.0 98 42 914 0201