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HARTING

Pushing Performance

HARTING News 2009

People | Power | Partnership

Transforming customer wishes into concrete solutions

Headquartered in Espelkamp in East Westphalia, Germany, the HARTING Technology Group develops tailored solutions and products revolving around electrical and electronic connector technologies. These offerings focus on power and data transmission applications, as well as on network solutions. Founded in 1945 in Minden, HARTING is currently employing a workforce of more than 3200 members of staff worldwide.
In today's increasingly knowledge and information shaped societies, the capability to network and integrate with customers and suppliers, as well as technology and business partners is playing the decisive role.
And this applies to national as well as international levels. With 40 Subsidiary companies and Representatives in 27 countries, HARTING is committed to maintaining close proximity to markets and customers. Always at hand on location, HARTING is able to rapidly record market impulses and respond flexibly.

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.

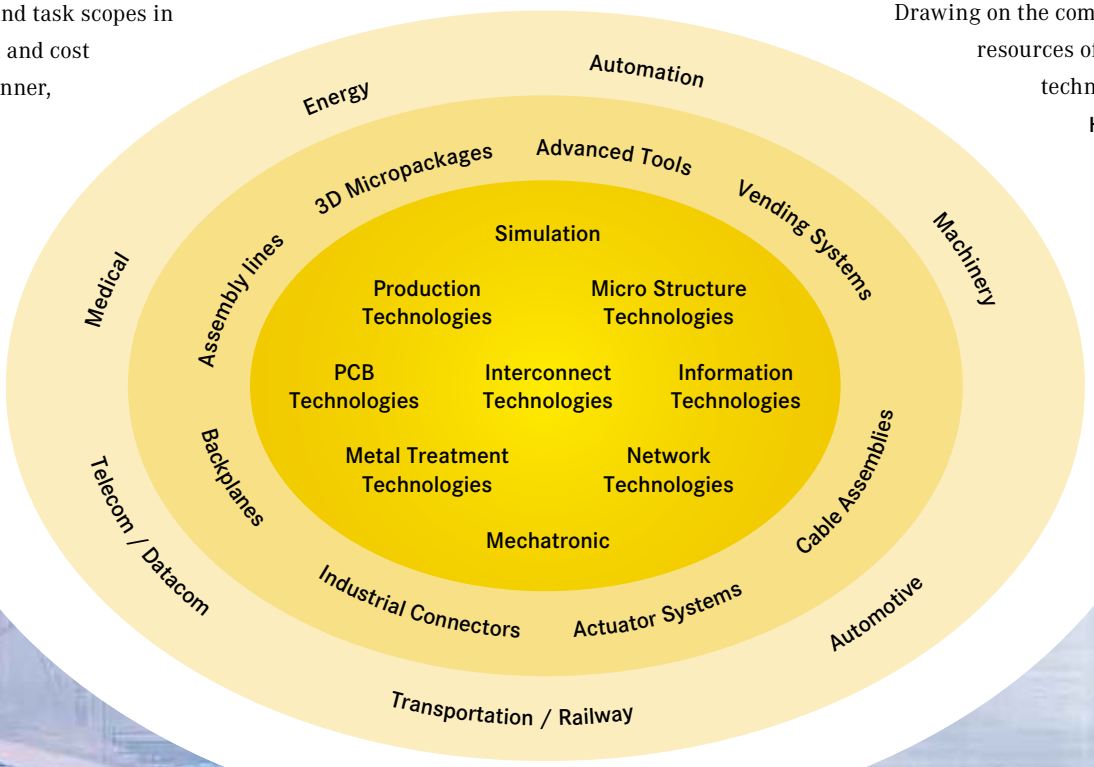
OPTING FOR HARTING OPENS UP AN INNOVATIVE, COMPLEX WORLD OF CONCEPTS AND IDEAS.

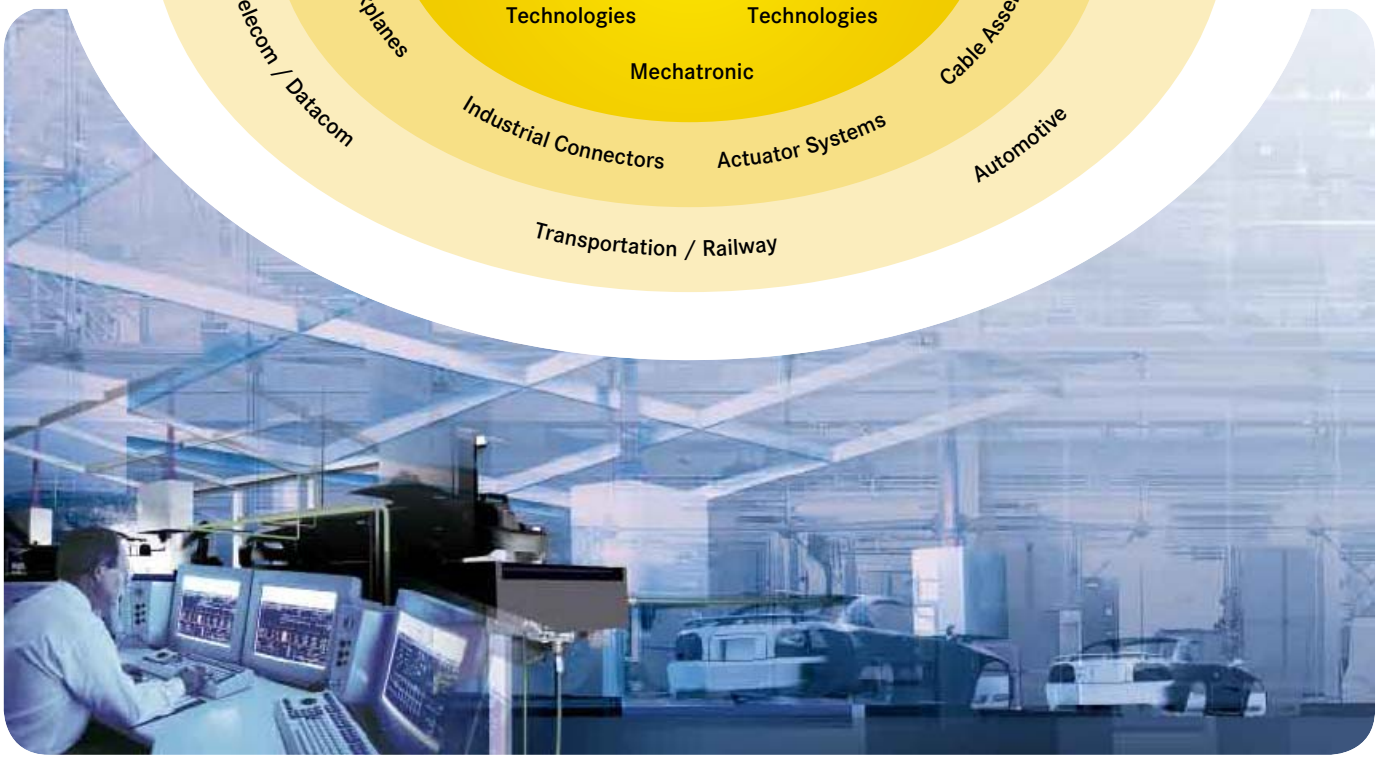
In order to develop connectivity and network solutions serving an exceptionally wide range of connector applications and task scopes in a professional and cost optimized manner, **HARTING** not only commands the full array of conventional tools and basic technologies. Over and beyond these capabilities, **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





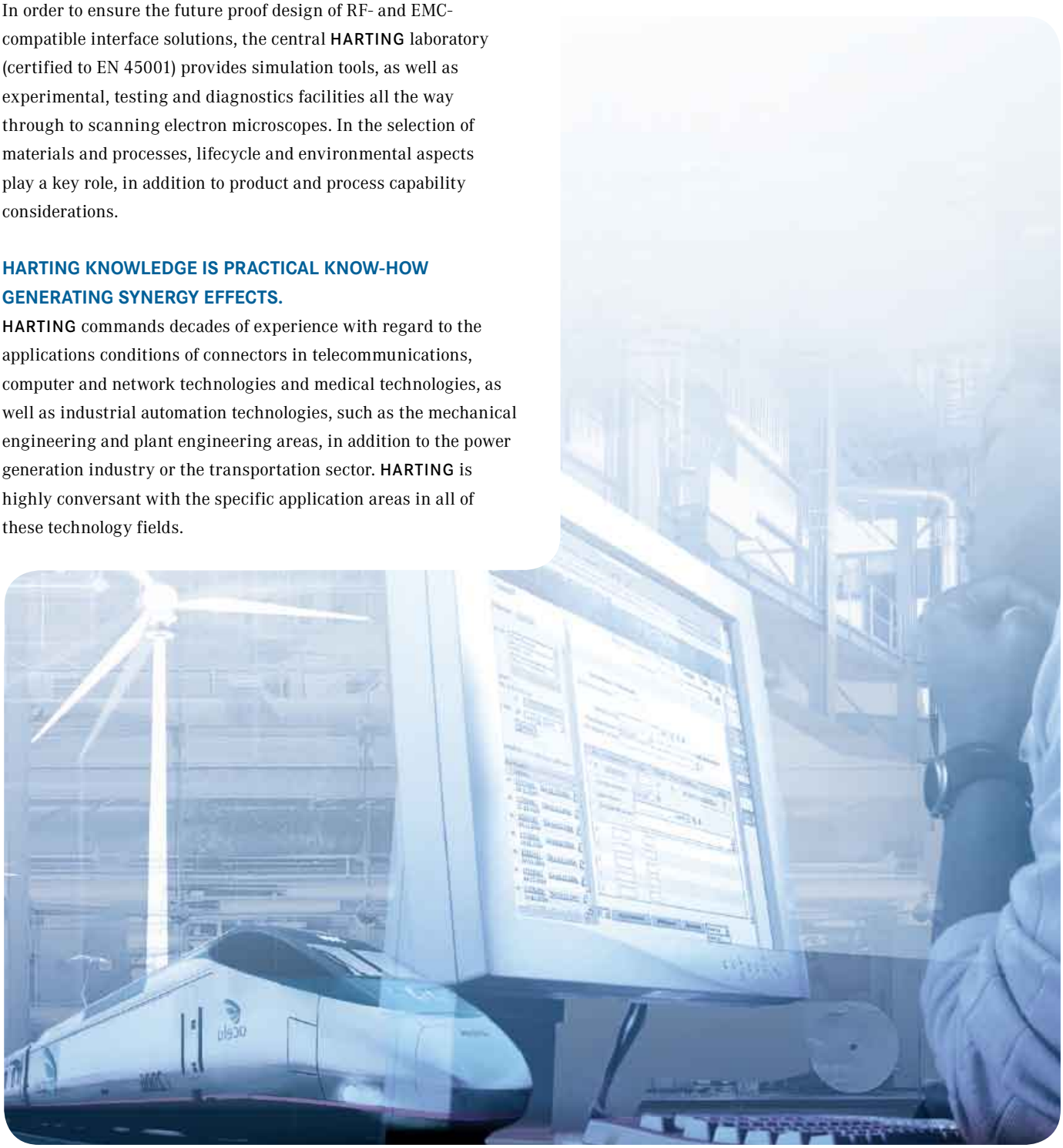
practical solutions for its customers. Whether this involves industrial networks for manufacturing automation, or hybrid interface solutions for wireless telecommunication infrastructures, 3D circuit carriers with microstructures, or cable assemblies for high-temperature applications in the automotive 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.



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Han® 3 HPR

Available by June 2009

Hood, high construction

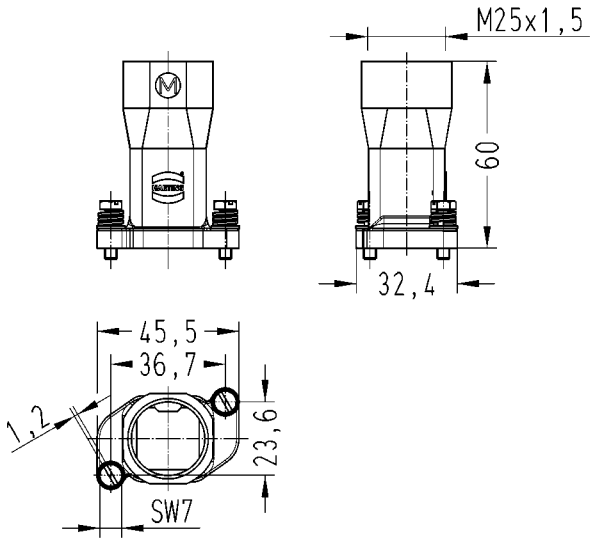
Features

- High construction, therefore large cabling space
- M25 cable entry
- Suitable for harsh environments
- Highly EMC resistant
- Suitable for sensitive interconnections that have to be protected and shielded
- Captive locking screws

Technical characteristics

Material	Zinc die-cast
Surface	Epoxy powder paint, RAL 9005 (black) RoHS conform Black chrome plated: not RoHS conform
Locking element	
- screw locking	M4
- material	Stainless steel
- tightening torque	2 Nm
Limiting temperatures	-40 °C ... +125 °C
Protection degree acc. to DIN EN 60 529 in locked position	IP 68

Identification	Part-Number	Size	Drawing	Dimensions in mm
Hood Han® 3 HPR high construction				
black chrome plated	19 40 003 0411	3 A		
epoxy powder paint	19 40 703 0411	3 A		



Han® 3 A

Available by July 2009

Plastic hood with integrated cable gland

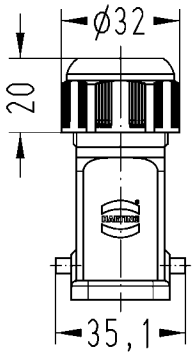
Features

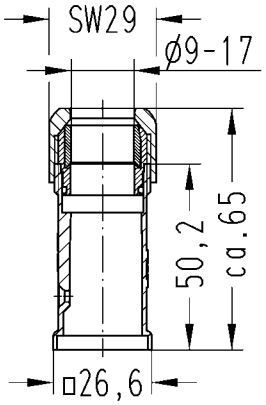
- Construction height reduced by 25 % when compared to the existing standard solution
- Large range of cable diameters (9 - 17 mm) can be used
- Reduced logistical effort due to integrated cable gland
- Also available as variant with glued seal for Han-Brid® inserts

Technical characteristics

Material	Plastic
Locking element	Plastic
Protection degree acc. to DIN EN 60 529 in locked position	IP 65 / 67
Cable diameter	9 - 17 mm

Identification	Part-Number	Size	Drawing	Dimensions in mm
Hood Han® 3 A with integrated cable gland				
without glued seal	19 20 003 0410	3 A		
with glued seal for Han-Brid® inserts	19 20 003 0413	3 A		





Features

- 40 / 64 contacts with crimp termination
- Up to 64 Han E® contacts in hoods/housings type Han® 24 B
- Polarised insert
- Contacts available with either hard silver plated or hard gold plated surface
- Suitable for hoods/housings of series Han® B, Han® EMV, Han® HPR, Han® M

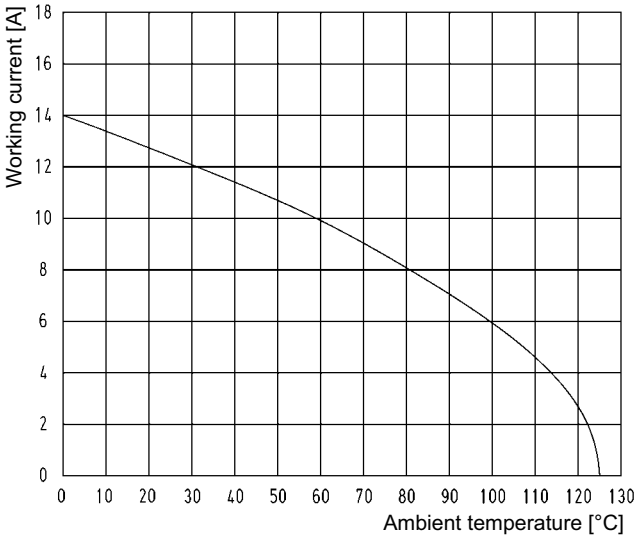
Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984
Inserts	
Number of contacts	40, 64 + PE
Electrical data acc. to DIN EN 61 984	**16 A 500 V 6 kV 3**
Rated current	16 A
Rated voltage	500 V
Rated impulse voltage	3 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
Contacts	
Material	Copper alloy
Surface	
- hard silver plated	3 µm Ag
- hard gold plated	2 µm Au over 3 µm Ni
Contact resistance	≤ 1 mΩ
Crimp termination	
- mm²	0.14 – 4.0 mm²
- AWG	26 – 12

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.

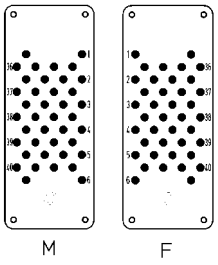
Han® 64 EEE: Wire gauge: 2.5 mm²



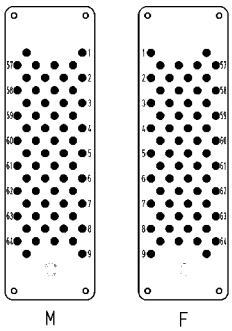
Contact arrangement

View from termination side

Han® 40 EEE



Han® 64 EEE

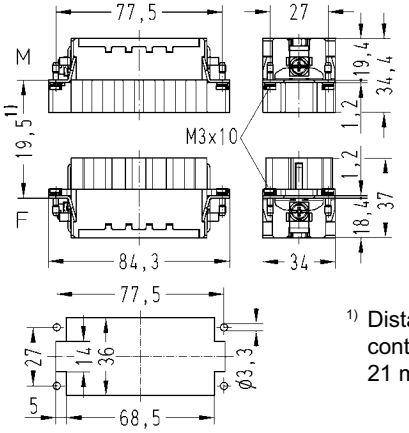
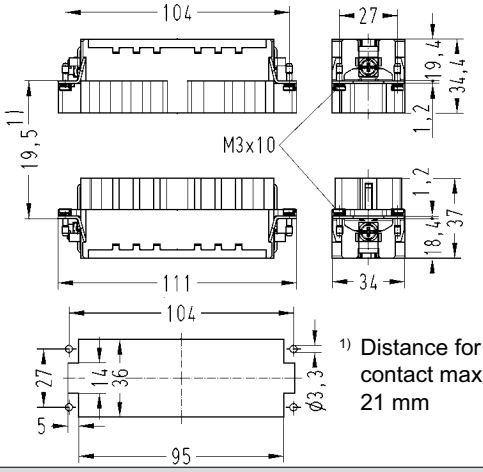


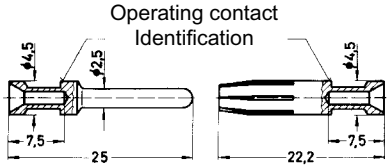
Number of contacts

40 / 64 + ⏚

Han® 40 EEE: Available by May 2009
Han® 64 EEE: Available

Inserts

Identification	Contact No.	Part Number Male insert	Part Number Female insert	Dimensions in mm
Crimp termination order crimp contacts separately	40	09 32 040 3001	09 32 040 3101	 1) Distance for contact max. 21 mm
	64	09 32 064 3001	09 32 064 3101	 1) Distance for contact max. 21 mm

Identification	Wire gauge mm²	Part Number Male contacts	Part Number Female contacts	Dimensions in mm
Crimp contacts silver plated	0.14-0.37	09 33 000 6127	09 33 000 6227	Operating contact Identification 
	0.5	09 33 000 6121	09 33 000 6220	
	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 6217	
	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	

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 groove*	0.75	mm²	AWG 18	7.5 mm
1 groove	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

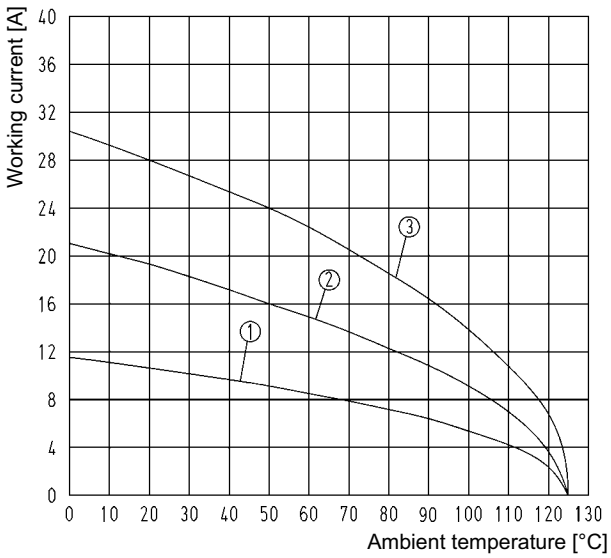
Features

- Innovative Han-Quick Lock® termination technology
- Field assembly without special tools
- Compatible with Han® Q 8/0 standard inserts with crimp terminal
- Reduced wiring times
- Insert suitable for plastic hoods and housings of the sizes Han-Compact®
- Space-saving and compact design
- Leading protective ground contact

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: 0.5 mm²
② Wire gauge: 1.5 mm²
③ Wire gauge: 2.5 mm²



Technical characteristics

Specifications	DIN EN 60 644-1 DIN EN 61 984
Inserts	
Number of contacts	8 + PE
Electrical data acc. to DIN 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
Termination	Han-Quick Lock®
Insulation resistance	≥ 10^{10} Ω
Material insert	Polycarbonate
Material seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles
Contacts	
Material	Copper alloy
Surface	
- hard silver plated	3 µm Ag
Contact resistance	≤ 3 mΩ
Han-Quick Lock®	
- mm²	0.5 – 2.5 mm²
- AWG	20 – 14
Maximum insilation cross section	ø = 3.6 mm
Plastic hoods/ housings	
Material	Polycarbonate
Locking element	Polyamide
Flammability acc. to UL 94	V 0
Hoods/ housings seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529 in locked position	IP 65

Han® Q 8/0 Quick Lock

Han-Quick Lock®

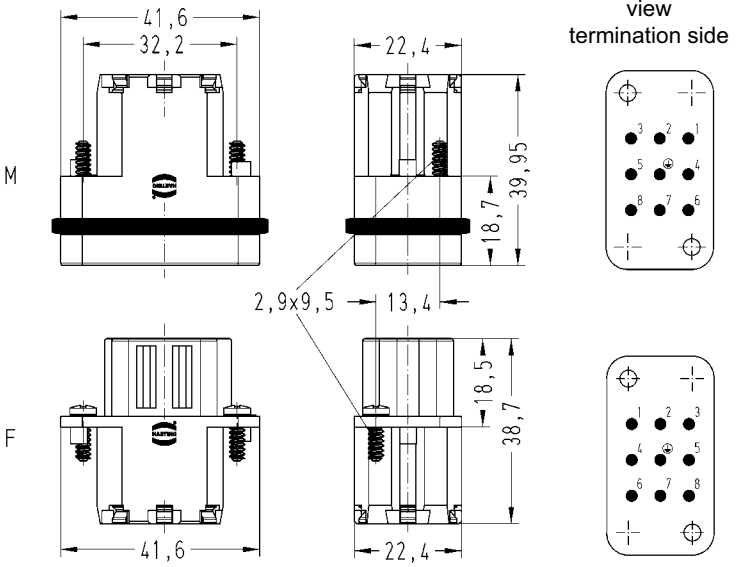
Number of contacts

8 + ⏚

Available by July 2009

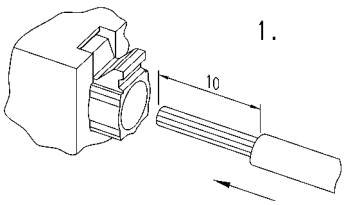
Inserts with Han-Quick Lock® Termination

Identification	Part-Number	Drawing	Dimensions in mm
Han® Q 8/0 Quick Lock			
Male insert	09 12 008 2633		
Female insert	09 12 008 2733		

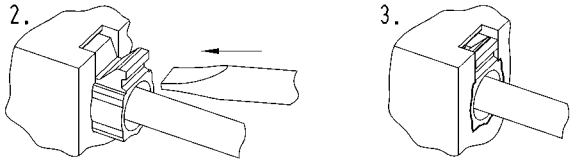


Assembly Manual

Remove cable jacket and strip the fine stranded wires

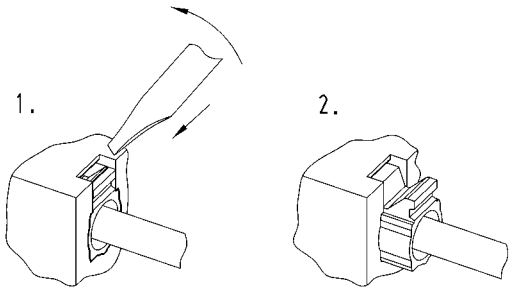


Push fine stranded wires into the Han-Quick Lock® contact and push the blue slide with a screw driver[1] until it comes to a stop



Removal Manual

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



[1] Screw driver: 0.4 x 2.5 mm or 0.5 x 3.0 mm

Features

- Innovative Han-Quick Lock® termination technology
- Field assembly without special tools
- Compatible with Han® 7 D standard inserts with crimp terminals
- Reduced wiring times
- Insert suitable for plastic hoods and housings using the Han® 3 A size
- Space-saving and compact design
- Leading protective ground contact

Technical characteristics

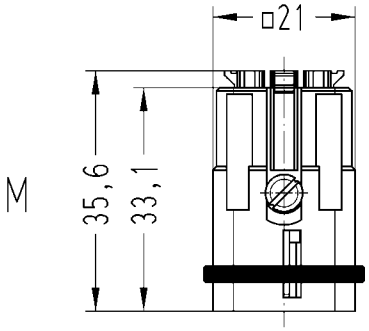
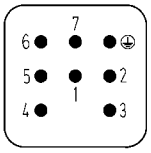
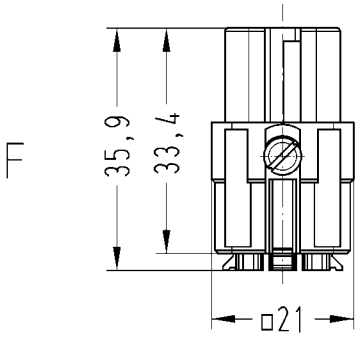
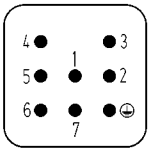
Specifications	DIN EN 60 644-1 DIN EN 61 984
Inserts	
Number of contacts	7 + PE
Electrical data acc. to DIN EN 61 984	**10 A 250 V 4 kV 3**
Rated current	10 A
Rated voltage	250 V
Rated impulse voltage	4 kV
Pollution degree	3
Termination	Han-Quick Lock®
Insulation resistance	≥ 10^{10} Ω
Material insert	Polycarbonate
Material seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles
Contacts	
Material	Copper alloy
Surface	
- hard silver plated	3 µm Ag
Contact resistance	≤ 3 mΩ
Han-Quick Lock®	
- mm²	0.34 – 1.5 mm²
- AWG	22 – 16
Maximum insilation cross section	ø = 3.0 mm
Plastic hoods/ housings	
Material	Polycarbonate RAL 7032
Locking element	Polyamide RAL 7032
Flammability acc. to UL 94	V 0
Hoods/ housings seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529 in locked position	IP 65

Number of contacts

7 + ⏚

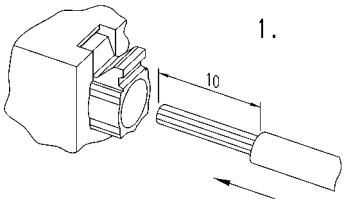
Available by June 2009

Inserts with Han-Quick Lock® Termination

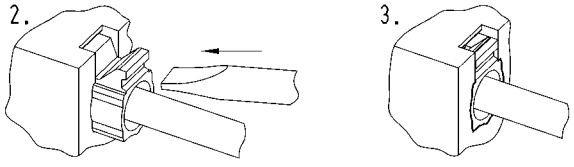
Identification	Part-Number	Drawing	Dimensions in mm
Han® 7 D Quick Lock Male insert	09 21 007 2632		Contact arrangement view termination side 
Female insert	09 21 007 2732		

Assembly Manual

Remove cable jacket and strip the fine stranded wires

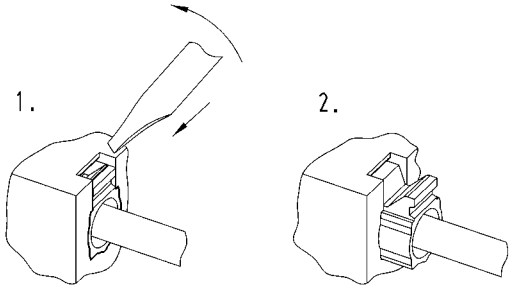


Push fine stranded wires into the Han-Quick Lock® contact and push the black slide with a screw driver[1] until it comes to a stop



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

Features

- Innovative Han-Quick Lock® termination technology
- Field assembly without special tools
- Compatible with Han® 8 D standard inserts with crimp terminals
- Reduced wiring times
- Insert suitable for metal hoods and housings using the Han® 3 A size
- Space-saving and compact design
- Leading protective ground contact

Technical characteristics

Specifications	DIN EN 60 644-1 DIN EN 61 984
Inserts	
Number of contacts	8
Electrical data acc. to DIN EN 61 984	**10 A ~50V/−120V 0,8 kV 3**
Rated current	10 A
Rated voltage	~50 V / −120 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Termination	Han-Quick Lock®
Insulation resistance	≥ 10^{10} Ω
Material insert	Polycarbonate
Material seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles
Contacts	
Material	Copper alloy
Surface	
- hard silver plated	3 µm Ag
Contact resistance	≤ 3 mΩ
Han-Quick Lock®	
- mm²	0.34 – 1.5 mm²
- AWG	22 – 16
Maximum insilation cross section	ø = 3.0 mm
Metal hoods/ housings	
Material	Die cast aluminium
Locking element	Metal
Flammability acc. to UL 94	V 0
Hoods/ housings seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529 in locked position	IP 44
with seal screw	IP 65

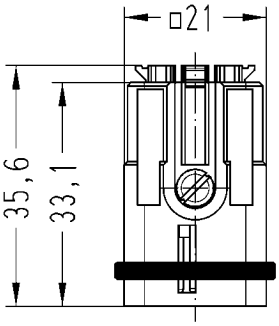
Number of contacts

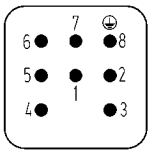
8

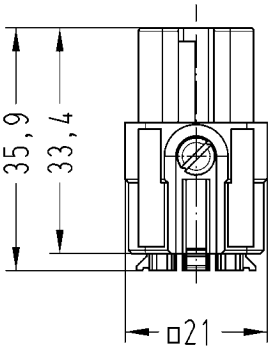
Available by June 2009

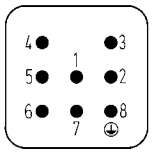
Inserts with Han-Quick Lock® Termination

Identification	Part-Number	Drawing	Dimensions in mm
Han® 8 D Quick Lock Male insert	09 36 008 2632	M	Contact arrangement view termination side
Female insert	09 36 008 2732	F	



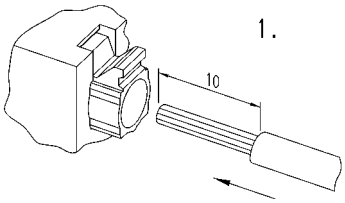




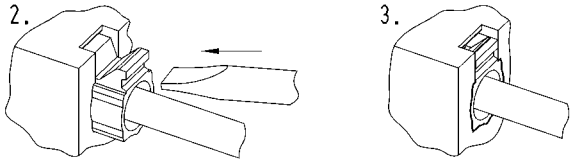


Assembly Manual

Remove cable jacket and strip the fine stranded wires

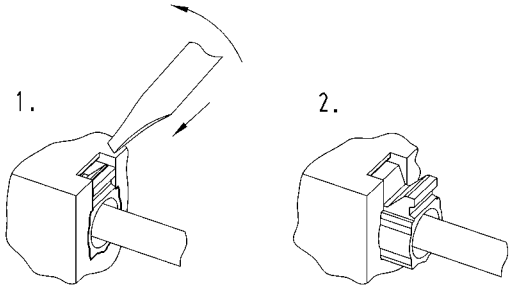


Push fine stranded wires into the Han-Quick Lock® contact and push the black slide with a screw driver[1] until it comes to a stop



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

Features

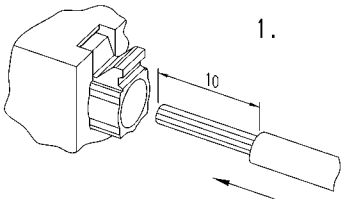
- Innovative Han-Quick Lock® termination technology
- Field assembly without special tools
- Mating compatible with standard Han® DD Modul with crimp terminal
- Reduced wiring times

Technical characteristics

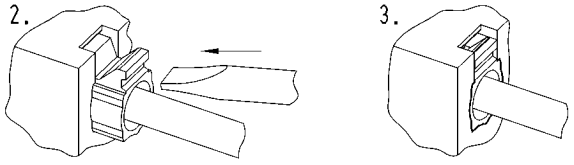
Specifications	DIN EN 60 644-1 DIN EN 61 984
Inserts	
Number of contacts	12
Electrical data acc. to DIN EN 61 984	**10 A 250 V 4 kV 3**
Rated current	10 A
Rated voltage	250 V
Rated impulse voltage	4 kV
Pollution degree	3
Termination	Han-Quick Lock®
Insulation resistance	≥ 10^{10} Ω
Material insert	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles
Contacts	
Material	Copper alloy
Surface	
- hard silver plated	3 µm Ag
Contact resistance	≤ 3 mΩ
Han-Quick Lock®	
- mm²	0.34 – 1.5 mm²
- AWG	22 – 16

Assembly Manual

Remove cable jacket and strip the fine stranded wires

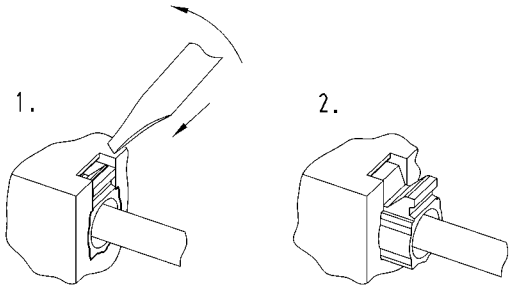


Push fine stranded wires into the Han-Quick Lock® contact and push the black slide with a screw driver[1)] until it comes to a stop



Removal Manual

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

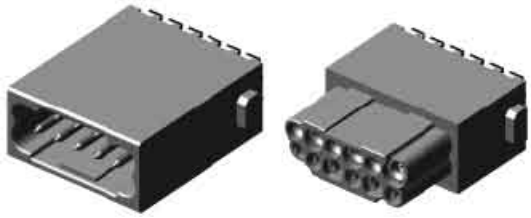


[1)] Screw driver: 0.4 x 2.5 mm

Number of contacts

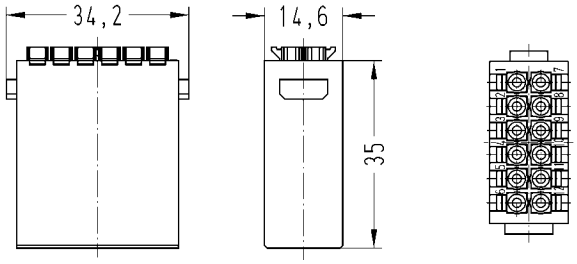
12

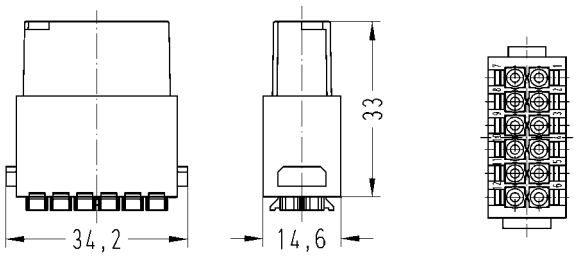
Available by October 2009



Inserts with Han-Quick Lock® termination

Identification	Part-Number	Drawing	Dimensions in mm
Han® DD module with Han-Quick Lock® terminal			Contact arrangement View termination side
Male insert	09 14 012 2632	M	
Female insert	09 14 012 2732	F	





Features

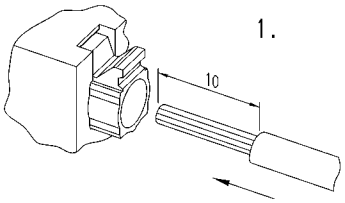
- Innovative Han-Quick Lock® termination technology
- Field assembly without special tools
- Mating compatible with standard Han® EE module with crimp terminal
- Reduced wiring times

Technical characteristics

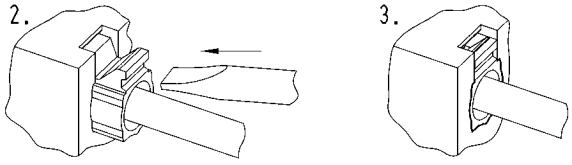
Specifications	DIN EN 60 644-1 DIN EN 61 984
Inserts	
Number of contacts	8
Electrical data acc. to DIN EN 61 984	**16 A 400 V 6 kV 3**
Rated current	16 A
Rated voltage	400 V
Rated impulse voltage	6 kV
Pollution degree	3
Pollution degree 2 also	16 A 400/690 V 6 kV 2
Termination	Han-Quick Lock®
Insulation resistance	≥ 10^{10} Ω
Material insert	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles
Contacts	
Material	Copper alloy
Surface	
- hard silver plated	3 µm Ag
Contact resistance	≤ 1 mΩ
Han-Quick Lock®	
- mm²	0.5 – 2.5 mm²
- AWG	20 – 14

Assembly Manual

Remove cable jacket and strip the fine stranded wires

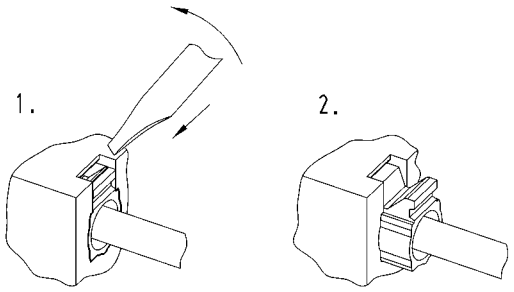


Push fine stranded wires into the Han-Quick Lock® contact and push the blue slide with a screw driver[1)] until it comes to a stop



Removal Manual

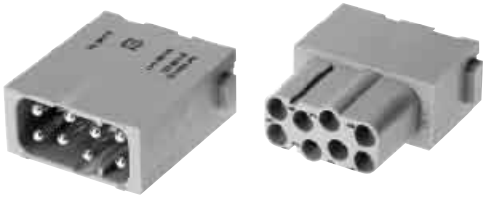
Please insert the screw driver[1)] at an angle of 45° into the opening and lever the blue slide out



[1)] Screw driver: 0.4 x 2.5 mm or 0.5 x 3.0 mm

Number of contacts

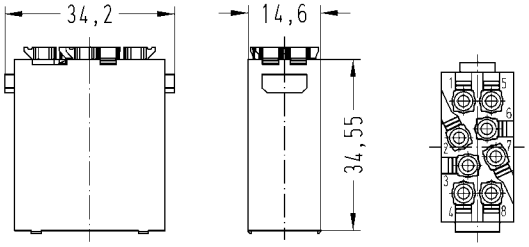
8

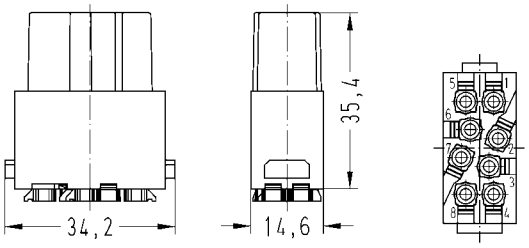


Inserts with Han-Quick Lock® termination

Identification	Part-Number	Drawing	Dimensions in mm
Han® EE module with Han-Quick Lock® terminal			
Male insert	09 14 008 2633	M	
Female insert	09 14 008 2733	F	

Contact arrangement
View termination side





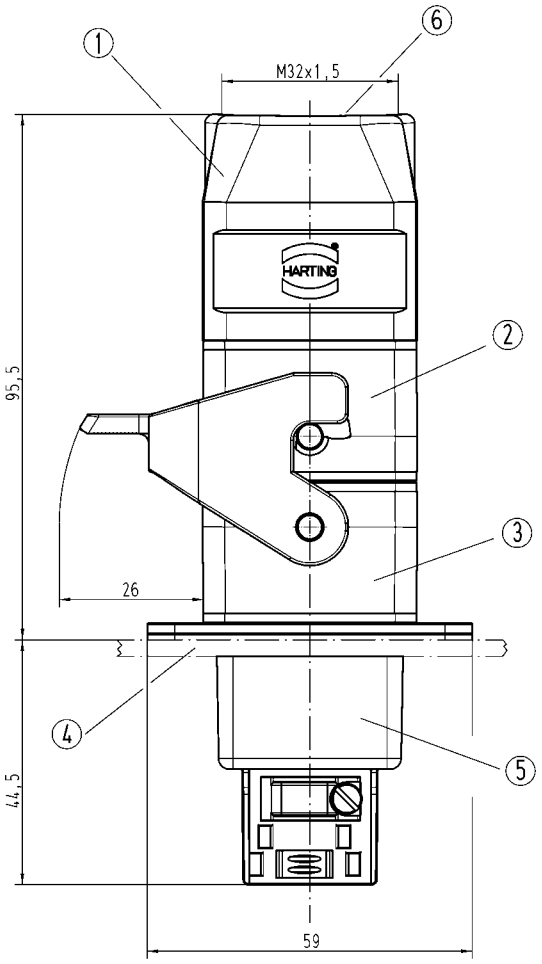
Features

- Compact and space saving
- High degree of flexibility due to modular assembly
- Easy and quick assembly
- Robust design
- Hood consists of two parts
- Good EMC shielding between the two modules

Technical characteristics

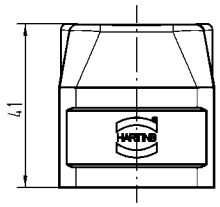
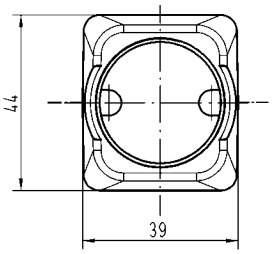
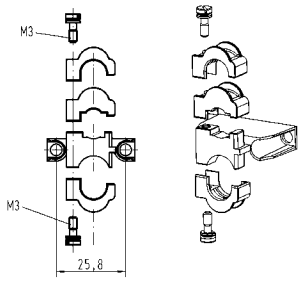
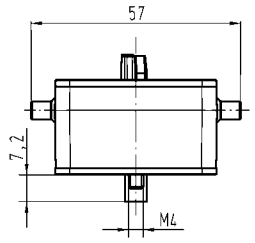
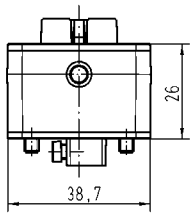
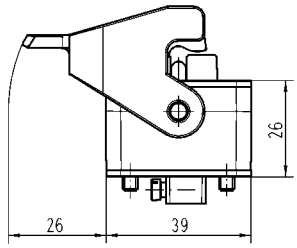
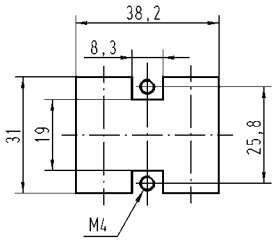
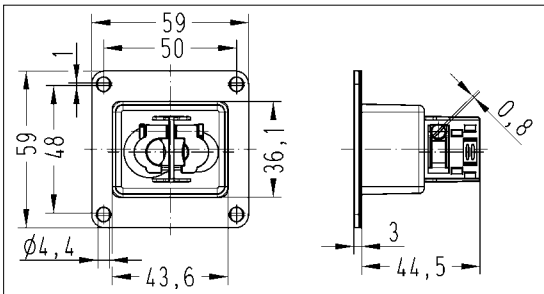
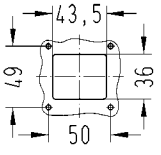
Hoods/Housings

Material	aluminium die-cast
Surface	powder-coated
Panel feed through housing/ Shielding frame	zinc die-cast alloy
Locking element	Han-Easy Lock®
Hoods/Housings sealing	NBR
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529 for coupled connector	IP 65
Mechanical working life - mating cycles	≥ 500
PE contact wire gauge	10 mm² / AWG 8
Stripping length	10 mm
Tightening tourque	1 Nm



① Hood with top entry
② Carrier hood
③ Bulkhead mounted housing with locking lever
④ Switch cabinet panel
⑤ Panel feed through housing
⑥ Thread M32

Hoods and housings

Identification	Part number	Drawing	Dimensions in mm
Hood Top entry M32	19 14 002 0402		
Shielding frame	09 14 000 9924		
Carrier hood	09 14 002 0311		
Bulkhead mounted housing 	09 14 002 0301		Panel cut out 
Panel feed through housing 	09 14 000 9928 NEW		Panel cut out 

Features

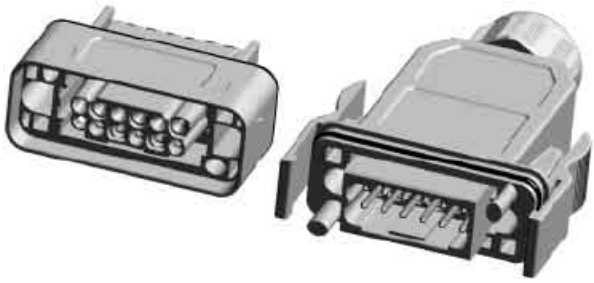
- Suitable for all Han-Modular® single modules
- The variant with PE connection uses pin 1 of the Han® module as PE
- Slim, space saving design
- Low cost plastic hoods and housings

Technical characteristics

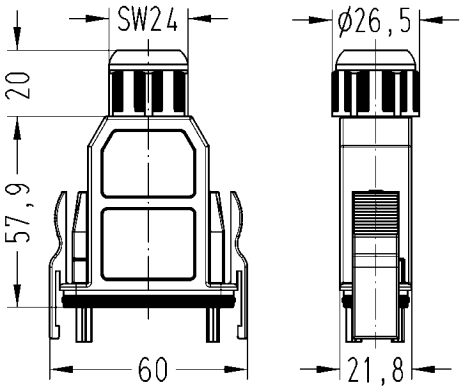
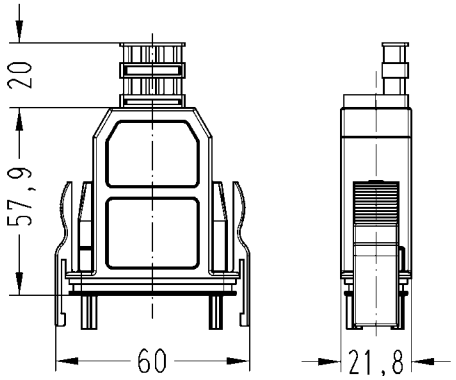
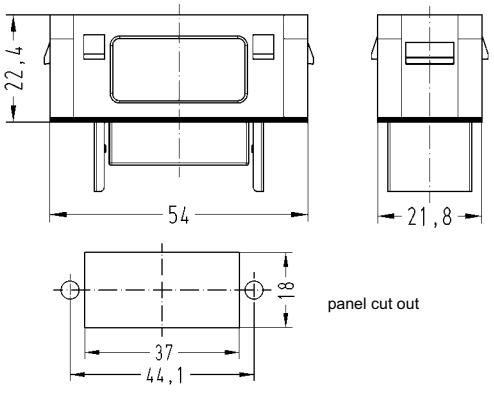
Specifications	DIN EN 60 664-1 DIN EN 61 984
Material	
Hood/housing	Polycarbonate
Seal	NBR
Cable gland	Polyamide
Limiting temperatures	-40 °C ... +85 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles
Protection degree acc. to DIN EN 60 529 in locked position	IP 20 / IP 65

Overview of suitable modules

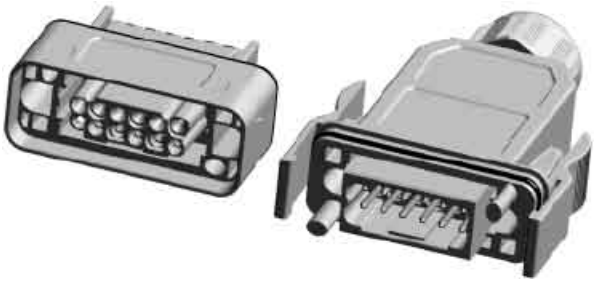
Available by August 2009



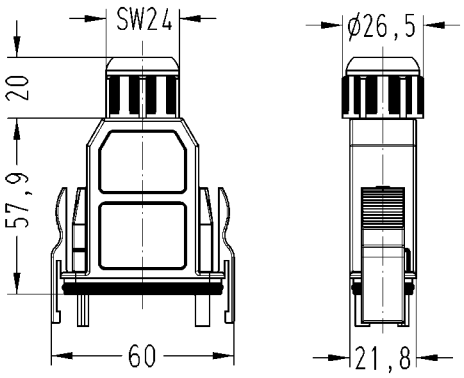
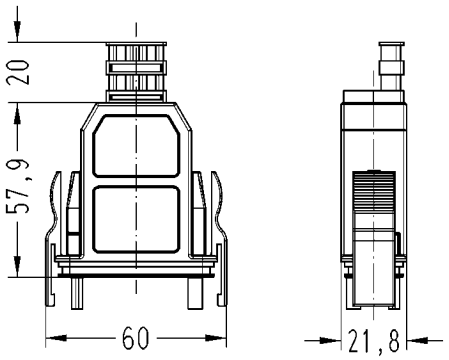
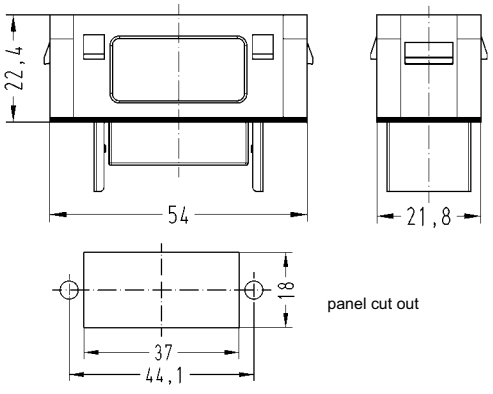
Plastic hoods and housings for 1 module

Identification	Flexible A ... F	Fixed a ... f	Drawings	Dimensions in mm
Hood with PE marking (Pin 1 = PE) IP 65 top entry 	09 14 001 0421			
Hood with PE marking (Pin 1 = PE) IP 20 top entry 	09 14 001 0423			
Bulkhead mounted housing with PE marking (Pin 1 = PE) IP 20 / IP 65 	09 14 001 0321			
Coding Pin 	09 14 000 9929			Delivery frame: 8 pieces per frame

Available by August 2009



Plastic hoods and housings for 1 module

Identification	Flexible A ... F	Fixed a ... f	Drawings	Dimensions in mm
Hood without PE IP 65 top entry 	09 14 001 0420			
Hood without PE IP 20 top entry 	09 14 001 0422			
Bulkhead mounted housing without PE IP 20 / IP 65 	09 14 001 0320			
Coding Pin 	09 14 000 9929			Delivery frame: 8 pieces per frame

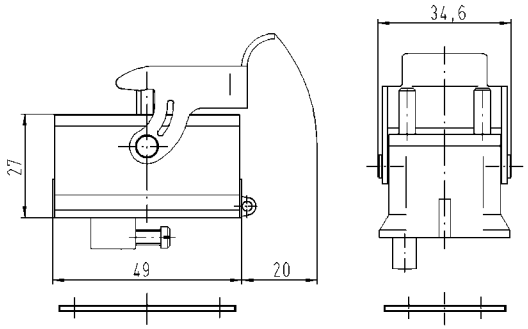
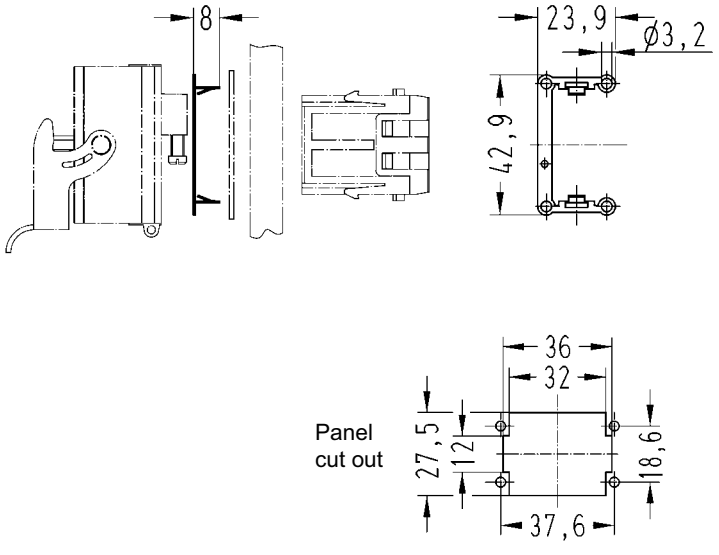
Fixing bracket

Features

- Compact and space saving
- High degree of flexibility due to modular assembly
- Pre-assembled modules can easily be snapped into pre-assembled housings
- Easy and quick assembly
- Robust design

Technical characteristics

Material	zinc die-cast alloy
Surface	nickel plated
Locking element	stainless steel
Fixing bracket	copper alloy, nickel plated
Hood/housing seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to	
DIN EN 60 529 in locked position	IP 65
Mechanical working life	≥ 500 cycles
PE contact	
Wire gauge	10 mm² / AWG 8
Stripping length	10 mm
Tightening torque	1 Nm

Identification	Part Number	Drawing	Dimensions in mm
Bulkhead mounted housing 	09 14 001 0301		
Fixing bracket 	09 14 000 9947	 Panel cut out	

Han-Modular® Docking Frame

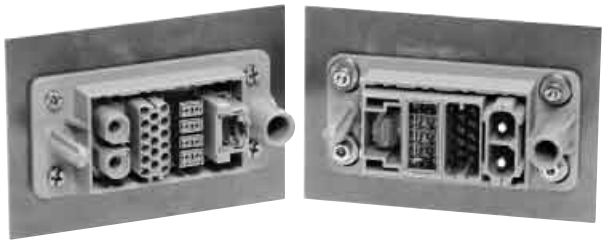
Features

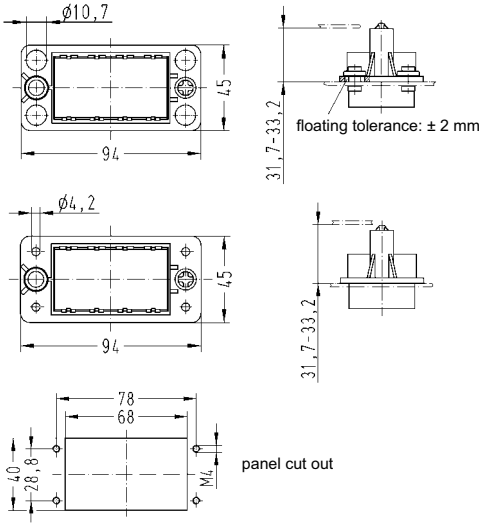
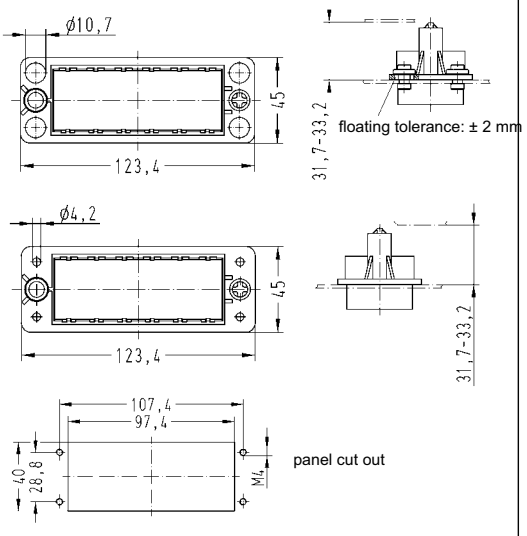
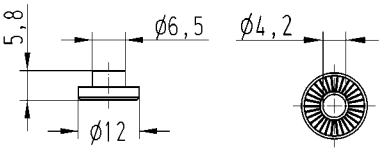
- Suitable for all Han-Modular® modules
- Very robust design
- Solid pre-leading guid pins and float bushes
- Can be fixed with standard M4 screws
- Due to the plastic material used in the docking frame without PE, the panel will need to be grounded separately.

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984
Material	
Docking Frame	polycarbonate
Float washer	zinc die-cast alloy
Floating tolerance	± 2 mm
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Han-Modular® Docking Frame



Identification	Float mount A ... F	Fixed a ... f	Drawings	Dimensions in mm
Docking frame for 4 modules	09 14 016 1701	09 14 016 1711		
Docking frame for 6 modules	09 14 024 1701	09 14 024 1711		
Float washer to enable the frame to be float mounted using standard M4 fixing screws	09 14 000 9936			

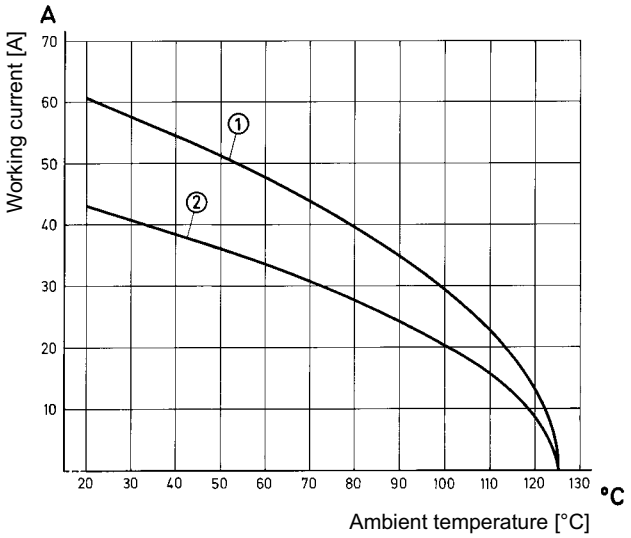
Features

- Crimp termination
- Plug compatible with Han® 40 A module axial screw termination

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984
Inserts	
Number of contacts	2
Electrical data acc. to DIN EN 61 984	**40 A 1000 V 8 kV 3**
Rated current	40 A
Rated voltage	1000 V
Rated impulse voltage	8 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
Contacts	
Power contacts	
Material	Copper alloy
Surface	
- hard-silver plated	3 µm Ag
Contact resistance	≤ 0.3 mΩ
Crimp terminal	
- mm²	1,5 - 10 mm²
- AWG	16 ... 8

Current Carrying Capacity



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 24 B Hood/housing with 6 modules, wire gauge: 10 mm²

② 24 B Hood/housing with 6 modules, wire gauge: 6 mm²

Han-Modular® 40 A module

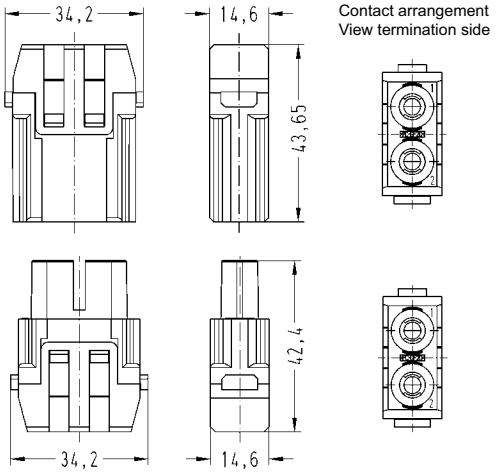
1000 V 40 A

Number of contacts

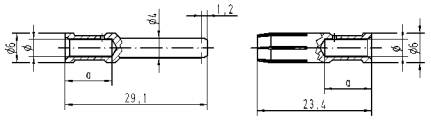
2

40 A module with crimp termination

Identification	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Han® 40 A module crimp terminal	09 14 002 3002	09 14 002 3102	M F	Contact arrangement View termination side



Identification	Wire gauge mm²	Part-Number Male contacts (M)	Part-Number Female contacts (F)	Drawings	Dimensions in mm
Crimp contacts silver plated	1.5	09 32 000 6104	09 32 000 6204		
	2.5	09 32 000 6105	09 32 000 6205		
	4	09 32 000 6107	09 32 000 6207		
	6	09 32 000 6108	09 32 000 6208		
	10	09 32 000 6109	09 32 000 6209		



Wire gauge		ø	Stripping length of stranded wire
1.5 mm²	AWG 16	1.75 mm	9.0 mm
2.5 mm²	AWG 14	2.25 mm	9.0 mm
4.0 mm²	AWG 12	2.85 mm	9.6 mm
6.0 mm²	AWG 10	3.50 mm	9.6 mm
10 mm²	AWG 8	4.30 mm	15 mm

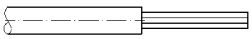
Stripping length a = 15 mm for cable ≥ 5mm
Stripping length a = 18 mm for cable > 6.4mm

Han-Modular® 100 A module

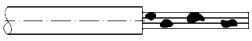
Features

- Crimp termination
- Remove of the contacts from the mating side
- Connect PE contact with special cable shoe
- Plug compatible with Han® 100 A module axial screw termination
- For crimp dies acc. to DIN 46 235

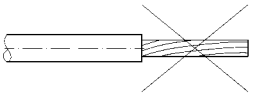
Assembly Details



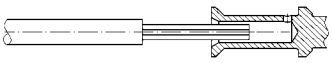
Cut the cable head square and strip the insulation



The copper strands must be cleaned from dirt and oxid film



Copper strands must not be drilled

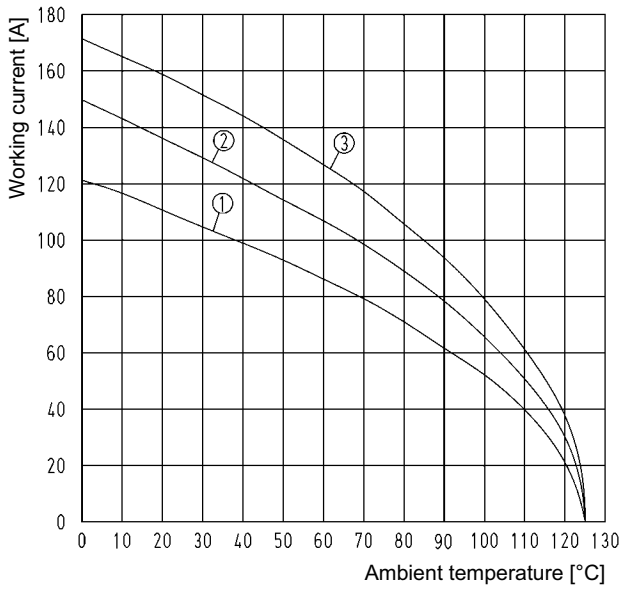


Insert the cable strand completely into the crimp ferrule.
Insertion check via inspection hole

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984
Inserts	
Number of contacts	2
Electrical data acc. to DIN EN 61 984	**100 A 1000 V 8 kV 3**
Rated current	100 A
Rated voltage conductor - ground	1000 V
Rated voltage conductor - conductor	1000 V
Rated impulse voltage	8 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
Max. insulation diameter	14 mm
Contacts	
Power contacts	
Material	Copper alloy
Surface	
- hard-silver plated	3 µm Ag
Contact resistance	≤ 0.3 mΩ
Crimp terminal	
- mm²	16 - 35 mm²
Crimp dies	acc. to DIN 46 235

Current Carrying Capacity



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

with 3 modules in hoods/housings size 24 B
① Wire gauge: 16 mm²
② Wire gauge: 25 mm²
③ Wire gauge: 35 mm²

Han-Modular® 100 A module

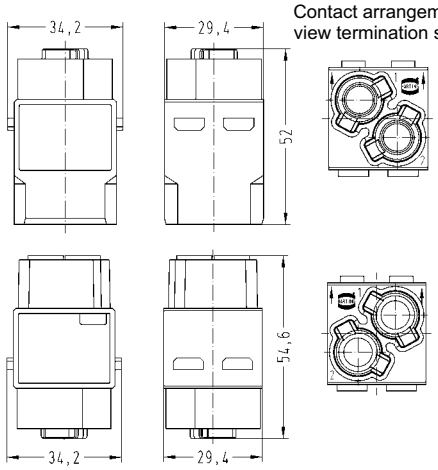
1000 V 100 A

Number of contacts

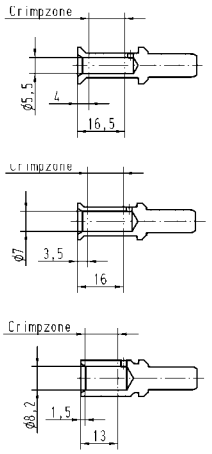
2

100 A module with crimp termination

Identification	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Han® 100 A module Crimp terminal	09 14 002 3051	09 14 002 3151	M F	Contact arrangement view termination side



Identification	Wire gauge mm²	Part-Number Male contacts (M)	Part-Number Female contacts (F)	Drawings	Dimensions in mm
Crimp contacts silver plated	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
16 mm² 25 mm² 35 mm²	5.5 mm 7.0 mm 8.2 mm	19.0 mm 19.0 mm 16.0 mm

* for stranded wire acc. to IEC 60228 class 5

* Crimp zone acc. to DIN EN 46 235

Identification	Wire gauge mm²	Part-Number
Removal tool		09 99 000 0383

Han-Modular® GigaBit Module

Features

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

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984

Inserts

Number of contacts	8
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

GigaBit Contacts

Number of contacts	8 + shielding
Electrical data acc. to DIN EN 61 984	**5 A 50 V 0.8 kV 3**
Rated current	5 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
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

D-Sub crimp contacts

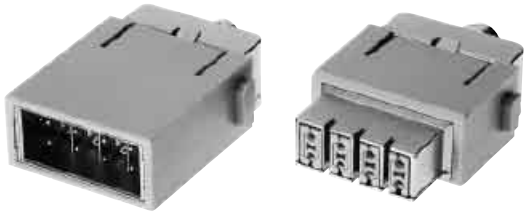
Crimp terminal	
- mm²	0.08 ... 0.52 mm²
- AWG	28 ... 20
Turned contacts	Performance level 1

Han-Modular® GigaBit Module

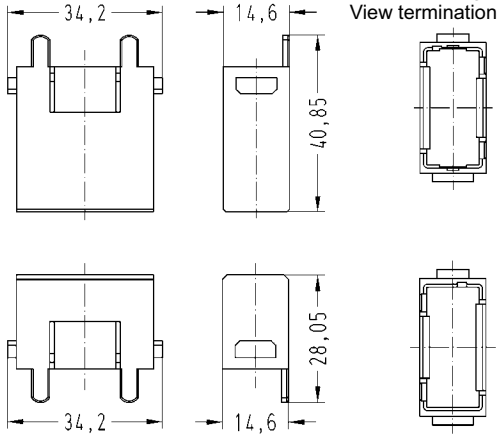
50 V 5 A

Number of contacts

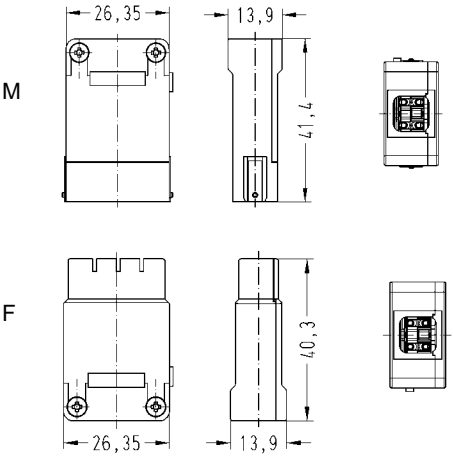
1 (8)



Identification	Part-Number Male insert (M)	Part-Number Female insert (F)	Drawings	Dimensions in mm
Han® GigaBit module	09 14 001 3011	09 14 001 3111	M / F	Contact arrangement View termination side



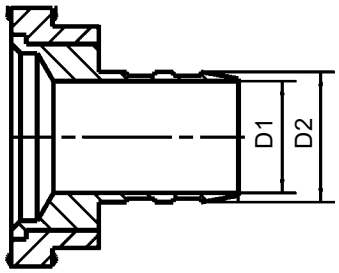
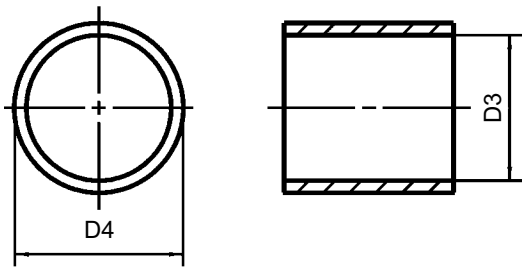
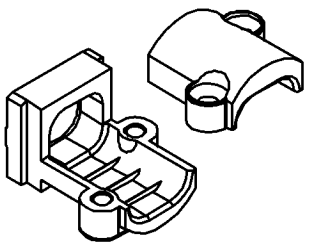
Identification	Wire gauge mm²	Part-Number Male contacts (M)	Part-Number Female contacts (F)	Drawings	Dimensions in mm
Crimp contacts 8 + shielding crimp contacts order separately		09 14 008 3011	09 14 008 3111	M / F	



D-Sub crimp contacts

Wire gauge mm²	Male contacts (M)	Female contacts (F)
0.08-0.21	06 03 000 0078	06 03 000 0080
0.13-0.33	06 03 000 0094	06 03 000 0096
0.33-0.52	06 03 000 0073	06 03 000 0074

Wire gauge	ø	Stripping length of stranded wire
0.80 - 0.21 mm²	AWG 28-24	5 mm
0.13 - 0.33 mm²	AWG 26-22	5 mm
0.33 - 0.52 mm²	AWG 22-20	5 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. ca. 7 ... 10 mm		61 03 000 0042		
cable diameter approx. ca. 10 ... 12 mm		61 03 000 0143		

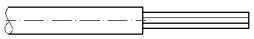
Notes

Han® HC module 350

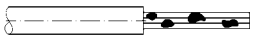
Features

- Crimp termination
- Plug compatible with Han® HC module axial screw termination
- Designed for thick cable insulations
- For crimp dies acc. to DIN 46 235

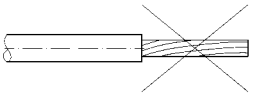
Assembly Details



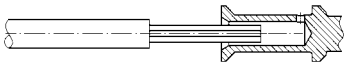
Cut the cable head square and strip the insulation



The copper strands must be cleaned from dirt and oxid film



Copper strands must not be drilled



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

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984

Inserts

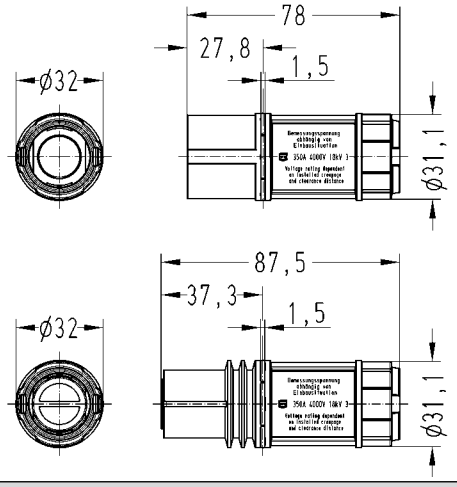
Electrical data acc. to DIN EN 61 984	
Rated current	350 A
Rated voltage	2000 V
Rated voltage	4000 V with adapter
Rated impulse voltage	12 kV / 18 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ω
Material	Polyamide
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Contacts

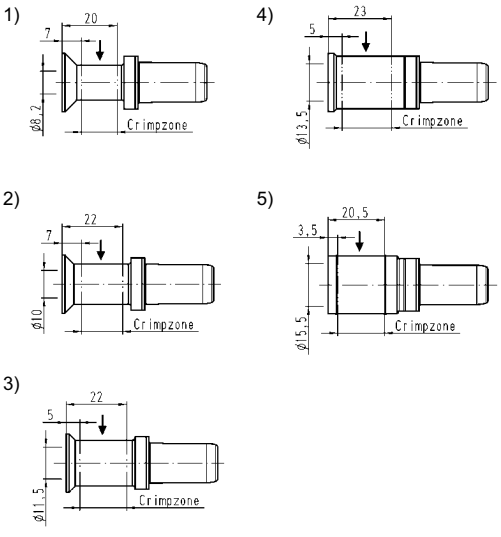
Power contacts	
Material	Copper alloy
Surface	
- hard-silver plated	3 µm Ag
Contact resistance	≤ 0.3 mΩ
Crimp terminal	
- mm²	35 - 120 mm²
Max. insulation diameter	22 mm
Crimp dies	acc. to DIN 46 325
Pressing force requirement	130 kN

For more information to create different contact arrangements please refer to main catalogue HARTING Industrial Connectors Han® chapter 14, from page 14 on.

Identification	Part-Number Male insert (M)	Female insert (F)	Drawings	Dimensions in mm
Han® HC module 350 Crimp terminal	09 11 001 3001	09 11 001 3101	M F	



Identification	Wire gauge mm²	Part-Number Male contacts (M)	Female contacts (F)	Drawings	Dimensions in mm
Crimp contacts* Silver plated	35[1]	09 11 000 6140	09 11 000 6240	1)	
	50[2]	09 11 000 6141	09 11 000 6241	2)	
	70[3]	09 11 000 6142	09 11 000 6242	3)	
	95[4]	09 11 000 6143	09 11 000 6243	4)	
	120[5]	09 11 000 6144	09 11 000 6244	5)	



Wire gauge	ø	Stripping length
35 mm²	8.2 mm	26 mm
50 mm²	10.0 mm	28 mm
70 mm²	11.5 mm	28 mm
95 mm²	13.5 mm	30 mm
120 mm²	15.5 mm	24 mm
* for stranded wire acc. to IEC 60 228 class 5		

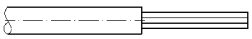
* Crimp zone acc. to DIN EN 46 235

Han® HC module 650

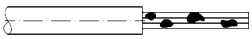
Features

- Crimp termination
- Plug compatible with Han® HC module 650 axial screw termination
- Contact in one piece

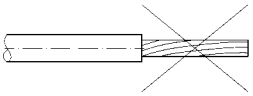
Assembly Details



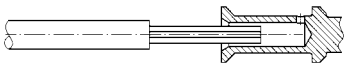
Cut the cable head square and strip the insulation



The copper strands must be cleaned from dirt and oxid film



Copper strands must not be drilled



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

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984

Inserts

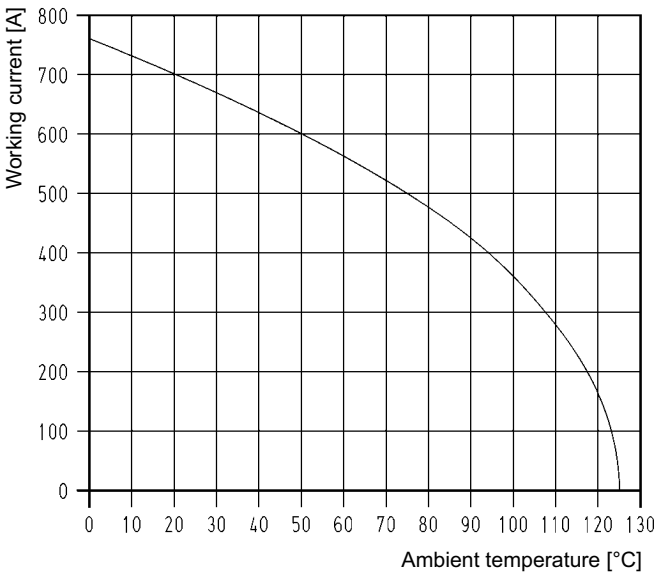
Electrical data acc. to DIN EN 61 984

Rated current	650 A
Rated voltage	2000 V
Rated voltage	4000 V with adapter
Rated impulse voltage	12 kV / 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	240 mm²
Max. insulation diameter	33 mm
Pressing force requirement	130 kN

Current Carrying Capacity



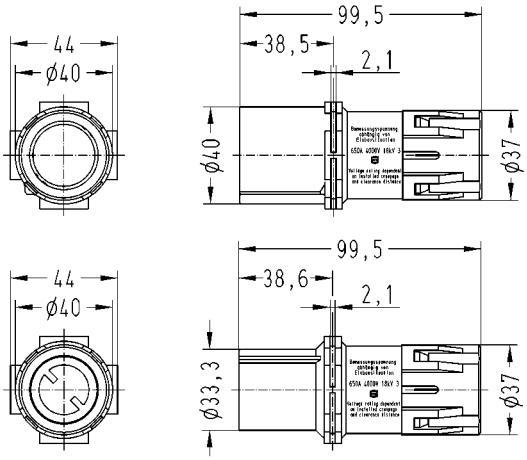
The current carrying capacity of the connectors is limited by the thermal load capability of the contact element material including the connections and the insulating parts. The derating curve is therefore valid for currents which flow constantly (non-intermittent) through each contact element of the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

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

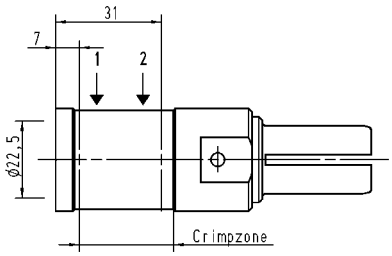
With 2 modules in hoods/housings size 24 B Han® HPR
Wire gauge: 240 mm²

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	



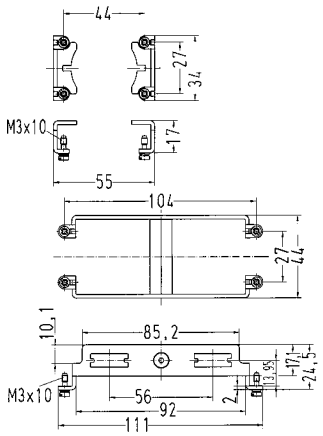
Identification	Wire gauge mm²	Part-Number Male contacts (M)	Part-Number Female contacts (F)	Drawings	Dimensions in mm
Crimp contacts* Silver plated	240	09 11 000 6167	09 11 000 6267		



Wire gauge	ø	Stripping length
240 mm²	22.5 mm	46 mm
* for stranded wire acc. to IEC 60 228 class 5		

Further cable diameters on request

Identification	Wire gauge mm²	Part-Number for hood	Part-Number for housing	Drawing	Dimensions in mm
Frames 1 pole	–	09 11 000 9971	09 11 000 9971		
2 pole	–	09 11 000 9972	09 11 000 9972		



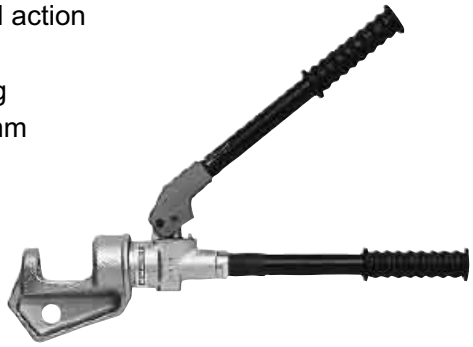
Identification	Part number	Drawing	Dimensions in mm

Crimp tool

Hydraulic handtool
Pressing force 130 kN

09 99 000 0385

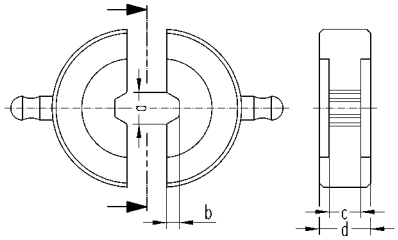
- fast foreward action
- storagebox
- weight 6.4 kg
- length 620 mm



Crimp dies

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

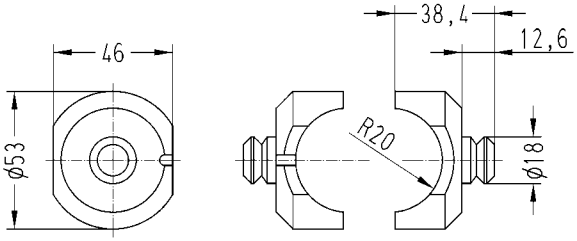
09 99 000 0386
09 99 000 0387
09 99 000 0388
09 99 000 0391
09 99 000 0392
09 99 000 0393
09 99 000 0394



Part-Number	Wire gauge	acc. to DIN 46 235	a	b	c	d
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

Die holder

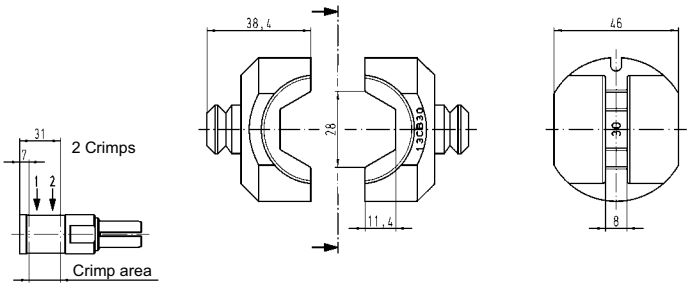
09 99 000 0389



Crimp die

Wire gauge 240 mm²

09 99 000 0801



Removal tool
for 100 A crimp contacts

09 99 000 0383

Han-Power® T

With 3 x Han® Q 2/0
Part-Number: 09 12 008 4752

Features Han-Power® T

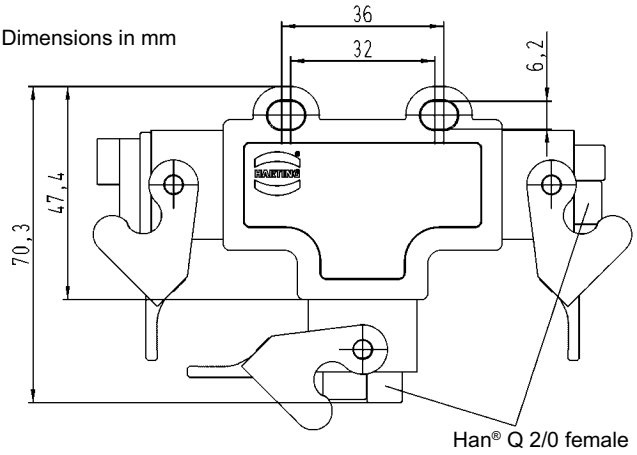
- 1 connection for power input
- 1 connection for power output
- 1 T-connection to device
- 2 power contacts
- Plastic housings are integrated in the moulding
- Plastic connector hood

Technical characteristics

Han-Power® T

Rated voltage	400 V
Rated voltage	600 V (acc. to UL)
Rated current	40 A
Number of contacts	2 power contacts + PE max. 4 - 6 mm²

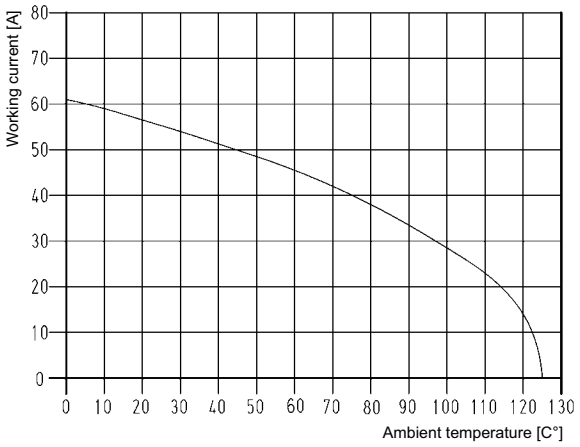
Dimensions in mm



Han® Q 2/0 female

Current Carrying Capacity

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



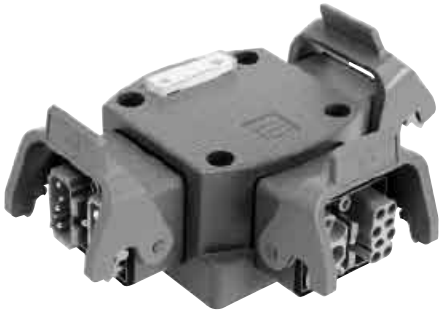
Han® 3 A Hoods

Material	Polycarbonate RAL 9005
Temperature range	-40 °C ... +125 °C
Protection degree acc. to DIN 60 529	IP 65 / IP 67

Han® Q 2/0

Number of contacts	2 + PE
Electrical data acc. to DIN EN 61 984	**40 A 400 V 6 kV 3**
Rated current	40 A
Rated voltage	400 V
Rated impulse voltage	6 kV
Pollution degree	3
Material	Polycarbonate
Insulation resistance	≥ 10^{10} Ω
Temperature range	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Han-Power® T Modular Twin

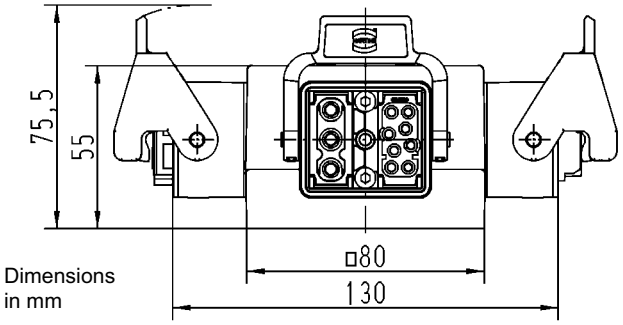


With Han-Modular® Twin
Part-Number: 09 12 008 4760

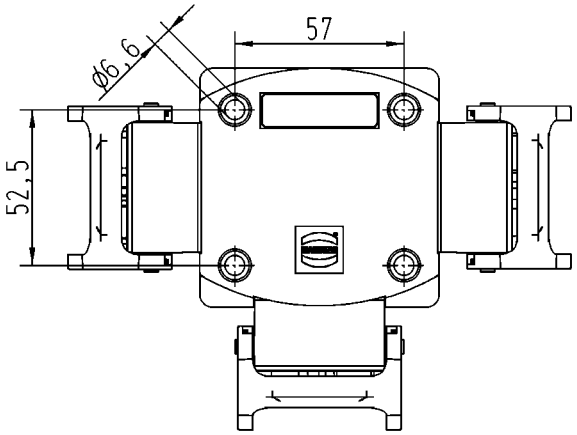
Features Han-Power® T

- 1 connection for mixed power input and output
- 1 T-connection to device
- 3 power contacts
- 4 signal contacts
- Metal hood
- Locking lever Han-Easy Lock®

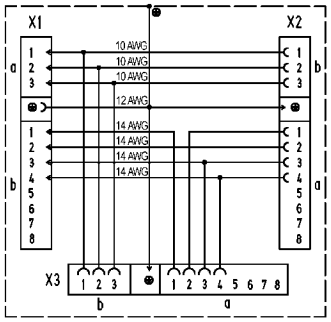
Han-Modular® Twin Hoods



Dimensions
in mm



Wiring diagram



Technical characteristics

Han-Power® T Modular Twin hood

Rated voltage	400 V
Rated current	40 A
Number of contacts	3 power contacts + PE max. 6 mm² 4 signal contacts max. 4.0 mm²
Surface	powder coated RAL 7037
Sealing	NBR
Temperature range	-40 °C ... +125 °C
Protection degree acc. to DIN 60 529	IP 65

Suitable inserts

Han® C module with crimp termination

Number of contacts	3
Electrical data acc. to DIN EN 61 984	**40 A 400/690 V 6 kV 3**
Rated current	40 A
Rated voltage	
Conductor - Ground	400 V
Conductor - Conductor	690 V
Rated impulse voltage	6 kV
Pollution degree	3

Han® EE module with crimp termination

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

For more Han-Modular® inserts see chapter 6 in the main catalogue of HARTING Electric GmbH & Co. KG

Notes

HARTING eCon 4000 – Introduction and features

Ethernet Switch
HARTING eCon 4000
Ethernet Switches, unmanaged,
for flat wall mounting

General Description

The Fast Ethernet Switches of the product family HARTING eCon 4000 are recommended for use in the widest range of industrial applications and support both Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s). The product family enables the connection of up to 8 network devices over Twisted Pair cables.

The eCon 4000 Ethernet Switch product family, with its integrated LEDs, supports fast and easy network diagnosis. The eCon Ethernet Switch operates as an Unmanaged Switch in Store and Forward Switching Mode and supports Auto-crossing, Auto-negotiation and Auto-polarity.

Features

- Ethernet Switch according to IEEE 802.3
- Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s)
- Auto-crossing
- Auto-negotiation
- Auto-polarity
- Store and Forward Switching Mode, non blocking
- Diagnostic LEDs (Link status, Data, Power)
- Mounting onto wall,
  optionally onto top-hat mounting rail

Advantages

- Robust metal housing and flat housing style
- EMC, temperature range and mechanical stability meet the highest demands
- Wide range for power supply input
- Wide range for type test according to EN 50 155 and EN 50 121-3-2

Application fields

- Railway applications
- Industrial automation
- Automotive industry
- Wind power

Technical characteristics

Ethernet interface

Number of ports	8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s
Maximum cable length	100 m (Twisted Pair; with Category 5 cable acc. to DIN EN 50 173-1)
Termination	M12 D-coding
Diagnostics (via LED)	
Link (per port)	• Status Link – ON • Data transfer (Act) – flashing • Data transfer rate (Speed) – 100 Mbit/s: Yellow / 10 Mbit/s: Green
PoE (per port)	• no PoE device – OFF • PoE device connected – Green • PoE device with failure – Red
Topology	Line, Star or mixed

Power supply

Input voltage		
eCon 4080-BPoE1		
mode PoE	48 V DC (46 ... 55 V DC)	
mode non PoE	24 / 48 V DC (12 … 60 V DC)	
eCon 4080-B3	72 / 110 V DC (50.4 ... 137.5 V DC)	
Termination	M12 A-coding, male, for redundant power supply	
Diagnostics (via LED)	Pwr x9 (switch) Power supply – Green	Pwr PoE (mode PoE) > 45 V DC – Green < 45 V DC – OFF

Design features

Housing material	Metal (powder coated)
Dimensions (W x H x D)	130 x 166 x 50 mm
Degree of protection acc. to DIN 60 529	IP 40 / IP 30 (eCon 4080-BPoE1 only)
Mounting	Wall mounting, flat
Weight	approx. 0.85 kg

Environmental conditions

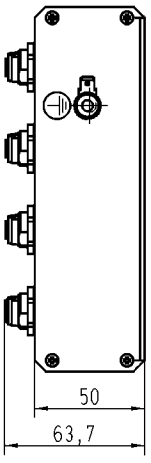
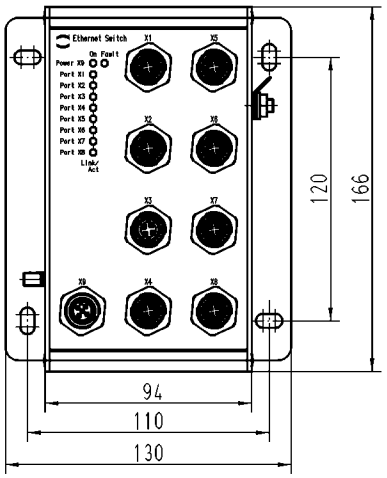
Operating temperature	–40 °C … +70 °C
Storage temperature	–40 °C … +85 °C
Relative humidity	10 % … 95 % (non-condensing)

Ethernet Switch
HARTING eCon 4080-B3

8-port Ethernet Switch (110 V DC) for flat installation

Unmanaged	IP 40	PROFINET compatible ☒	EtherNet/IP compatible ☐

Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding
Input voltage / Termination	72 / 110 V DC / M12 A-coding, male, for redundant power supply
Permissible range (min/max)	50.4 V … 137.5 V DC
Input current	approx. 40 mA (at 110 V DC)
Housing material	Metal (powder coated)
Dimensions (W x H x D)	130 x 166 x 50 mm
Weight	approx. 0.85 kg
Operating temperature	–40 °C … +70 °C
Approvals	cUL (in preparation)

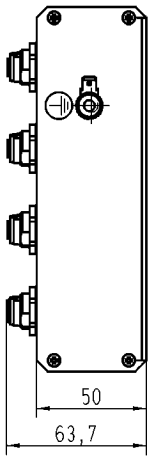
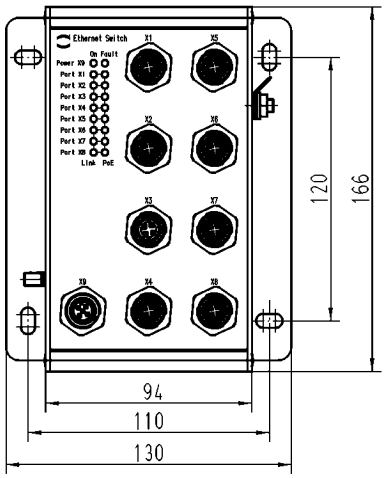
Identification	Part number	Drawing	Dimensions in mm
HARTING eCon 4080-B3 Ethernet Switch 110 V DC with 8 ports M12 D-coding for wall mounting	20 77 208 3003		

HARTING eCon 4000

Ethernet Switch
HARTING eCon 4080-BPoE1
8-port Ethernet Switch for flat installation

Unmanaged	IP 30	PROFINET compatible ☒	EtherNet/IP compatible ☐

Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding / PoE supports 8 ports
Mode PoE	
Input voltage / Termination	48 V DC / M12 A-coding, male, for redundant power supply
Permissible range (min/max)	46 V … 55 V DC
Input current	max. 3.6 A (at 48 V DC)
Mode Non-PoE	
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply
Permissible range (min/max)	12 V … 60 V DC
Input current	approx. 150 mA (at 24 V DC)
Housing material	Metal (powder coated)
Dimensions (W x H x D)	130 x 166 x 50 mm
Weight	approx. 0.85 kg
Operating temperature	–40 °C … +70 °C
Approvals	cUL (in preparation)

Identification	Part number	Drawing	Dimensions in mm
HARTING eCon 4080-BPoE1 Ethernet Switch PoE with 8 ports M12 D-coding for wall mounting	20 77 208 3009		

Introduction

For the user, HARTING's novel and innovative solutions open up new, more convenient and extensive options for configuring Unmanaged Ethernet Switches. The solutions available to date offered only very limited or basic options for making alterations to different settings on an Ethernet Switch.

The user made changes to the settings or the configuration via the DIP switches on the Ethernet Switch. The extensive possibilities for applications were physically restricted by the enormous space requirements of the mechanical solution.

Now for the first time, HARTING's sCon solution makes it possible for the user to realise more configurations than have been possible to date.

Ease of handling and simple operation have been designed in to meet real-life application requirements. Simple and fast configuration is what this solution aims to achieve.

All sCon Ethernet Switches can be configured via a USB connection cable.

At first sight, sCon Ethernet Switches do not differ from the Ethernet Switches available to date. However, the possibilities that sCon has to offer become more than apparent to the user when he connects the Ethernet Switch via the front-side USB socket to a PC, laptop or hand-held PC.

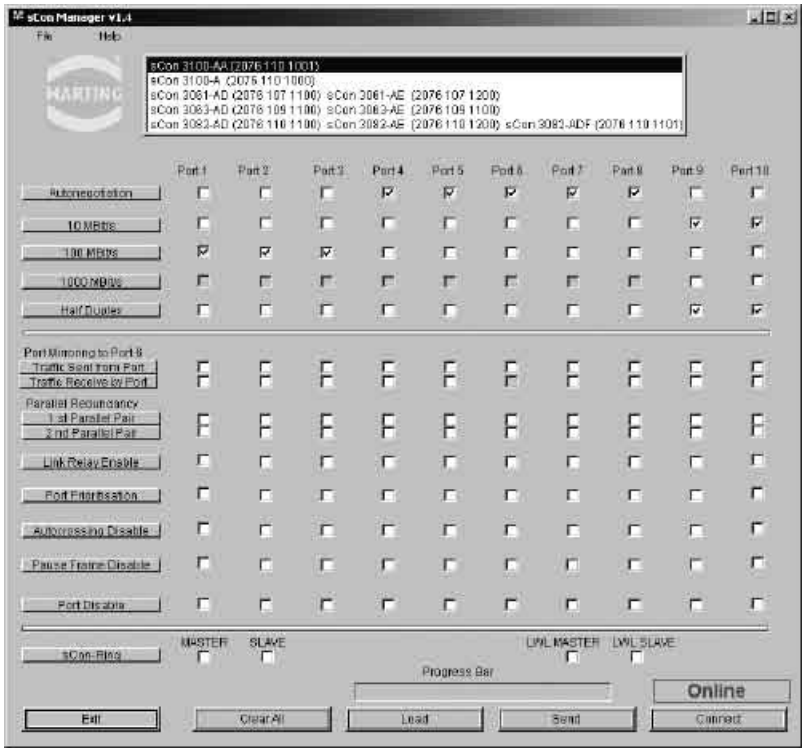


Figure 1 The Start-up menu

Once the sCon Ethernet Switch has been connected to a PC, it can be accessed on-screen in much the same manner as a commercially available USB stick (Figure 1: The Start-up menu).

The user only has to copy the sCon software in advance onto the PC. No administrator rights are required. The Ethernet Switch does not have to be connected to a power supply for configuration purposes. That means that the configuration procedure can take place at the user's location of choice: in the office, workshop or production facility. The sCon Ethernet Switch automatically detects which power supply is connected: mains supply or power supply via the USB port. Please note that it is not possible to operate the Ethernet Switch purely via the USB port. For normal industrial operations, the power must be supplied via one of the redundant inputs.

Introduction

Making configuration settings by means of DIP switches may appear to be uncomplicated. However, accidentally making an alteration to the configuration can happen more quickly than one would think possible, and in so doing make considerable changes to the previously set procedures. The sCon family prevents these inadvertent alterations to the configuration. No alteration can be made to the configuration without an USB connection and the software.

Each configuration can be archived and the backups retrieved for future projects. By making backups of the configuration, all settings can be conveniently stored in case servicing is necessary.

Archived configurations can be imported and printed out when convenient. These extensive options in sCon ensure that data security enjoys the significance it deserves.

The switch configuration is transmitted only when a new configuration is uploaded via the corresponding ‘Send’ button. This means that until the data has actually been uploaded, it is still possible to read-in the ‘old’ data from the sCon Ethernet Switch via the Refresh option. This means it is easily possible to reverse any inadvertent activation in the corresponding menu.

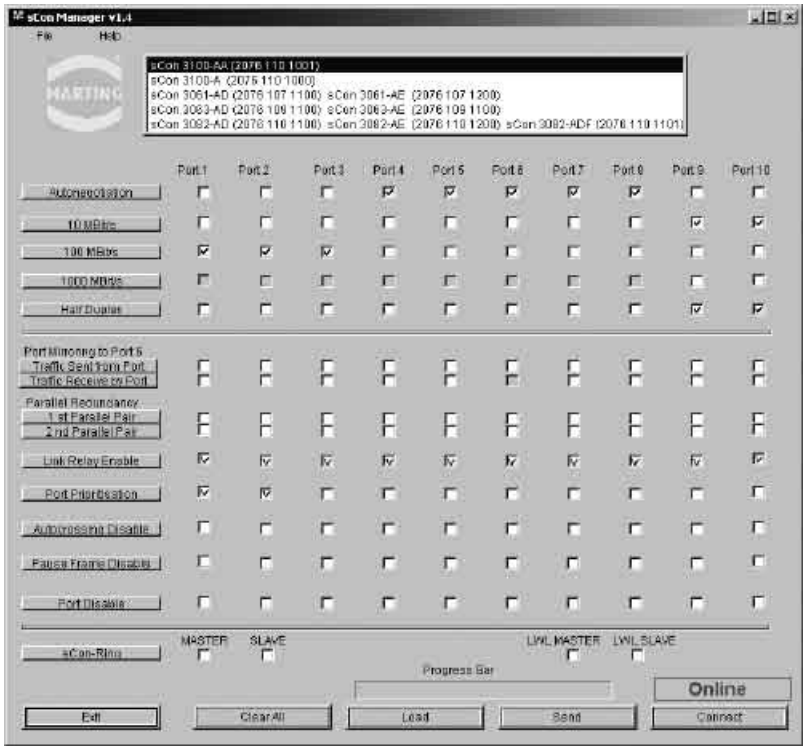


Figure 2 *Example of a configuration*

Once configured, the Ethernet Switch can be utilised immediately. The configuration remains stored in the Ethernet Switch after the USB cable is removed.

Meeting international standards, the USB port described is recognised as state-of-the-art technology. The standardised possibility for worldwide utilisation with all notebooks, PCs and Palmtops (revisions 1.0, 1.1 and 2.0) mean that this technology is suitable for universal usage.

The intuitive, but extensive options setting via the relevant buttons and the various options offered by sCon extend the range of applications for Unmanaged Ethernet Switches. With sCon, the gap between Unmanaged and manageable switches is getting smaller.

It is true that sCon is a solution for Unmanaged Ethernet Switches; however, it comes very close to Managed Ethernet Switch functionality.

HARTING sCon 3000 – Introduction and features

Ethernet Switch
HARTING sCon 3000

Ethernet Switch family, unmanaged,
for mounting onto top-hat mounting rail
in control cabinets including sCon functions

General Description

The Fast Ethernet Switches of the product family HARTING sCon 3000 can be configured via a USB port for special or more performance-oriented industrial usages. There are almost no limits to the different possibilities.

Activation of parallel and / or ring redundancy or port prioritisation will clearly increase the availability and reliability of data communications through the sCon 3000.

Features

- Ethernet Switch acc. to IEEE 802.3
- Store and Forward Switching Mode, non-blocking, unmanaged
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link status, Act, Power, Data transmission rate, Error)
- Following settings are available via USB port:
  - Alarm signalling contact
  - Auto-negotiation
  - 10/100/1000 Mbit/s
  - Full/Half Duplex
  - Ring and/or parallel redundancy
  - Port enable / disable
  - Port priority
  - Port mirroring
  - Pause Frame

Advantages

- Individually configurable via USB port
- Metal housing
- EMC, temperature range and mechanical stability meet the toughest demands
- Ring and/or parallel redundancy

Application fields

- Industrial automation
- Railway applications
- Power distribution systems
- Automotive industry
- Mechanical engineering

Technical characteristics sCon 3100-AA

Ethernet interface RJ45

Number of ports	8x 10/100Base-T(X), 2x 10/100/1000Base-T(X)
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	Line, Ring, Star or mixed

Power supply

Input voltage	24 V DC
Termination	5-pole screw terminal, pluggable for redundant power supply
Diagnostics (via LED)	Power supply

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact

Design features

Housing material	Metal (powder coated)
Dimensions (W x H x D)	60 x 132 x 104 mm (incl. cap, without connectors)
Degree of protection acc. to DIN 60 529	
sCon xxxx-AE	IP 30 IP 20
Mounting	• 35 mm top-hat rail acc. to EN 60 715 • Panel mounting, vertical assembly
Weight	approx. 0.6 kg

Environmental conditions

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

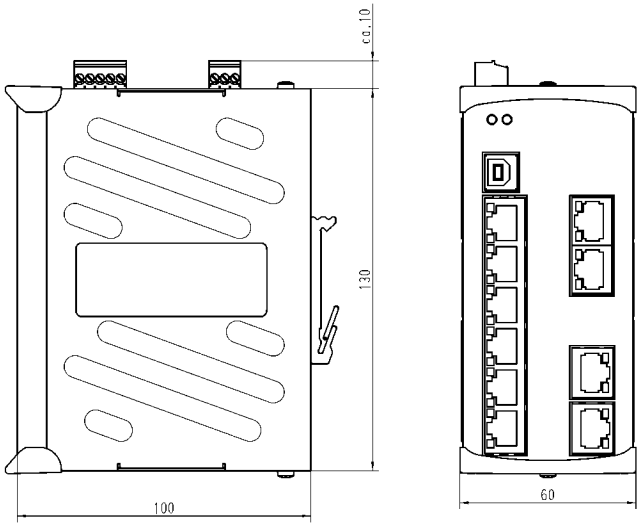
HARTING sCon 3000

Ethernet Switch
HARTING sCon 3100-AA

10-port Ethernet Switch for mounting onto top-hat mounting rail
in control cabinets including 2 Gigabit ports and sCon functions
extended temperature range

Unmanaged	IP 30	PROFINET compatible ☒	EtherNet/IP compatible ☐

Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair) 2x 10/100/1000Base-T(X) / RJ45 (Twisted Pair)
Input voltage / Termination	24 / 48 V DC / 5-pole screw terminal, pluggable redundant power supply
Permissible range (min/max)	9.6 V … 60 V DC
Input current	approx. 240 mA (at 24 V DC)
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact
Housing material	Metal (powder coated)
Dimensions (W x H x D)	60 x 132 x 104 mm (incl. cap, without connectors)
Weight	approx. 0.6 kg
Operating temperature	-40 °C … +70 °C
Approvals	UL 508
MTBF	670 000 h

Identification	Part number	Drawing	Dimensions in mm
HARTING sCon 3100-AA Ethernet Switch with 10 RJ45 ports including Set for assembly on standard rail	20 76 110 1001		

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 / 1000 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
Protocols	IPv4	RFC 791, 903, 951, 1293, 1519
	TCP	RFC 793, 896
	UDP	RFC 768
	Ethernet ARP	RFC 826
	ICMP	RFC 2521, 1191, 1788, 792
File Transfer	Firmware import and export via TFTP	
	Configuration import and export via TFTP	
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	
QoS		
	Quality of Service (QoS)	IEEE 802.1p
VLAN		
	Port protocol based VLANs	IEEE 802.1Q Rev D5.0, 2005
Redundancy		
	Spanning Tree (STP)	IEEE 802.1D (2004)
	Rapid Spanning Tree (RSTP)	IEEE 802.1D (2004)
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)	ISO/IEC 8802-3:2005 (E), IEEE 802.3-2005 Edition Clause 43 (IEEE 802.3ad)
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
Alarm		
	Alarms via E-mail (SMTP) and SNMP Traps	
	Signalling contact for low voltage detection or Link break	

Management functions

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
MIB Support		
	Enterprise (HARTING MIB)	
	MIB II	
	MIB II for SNMPv1, SNMPv2, SNMPv3	
	Interface group MIB	
	Bridge MIB	
	MIB for Ethernet-like interfaces (requires support in hardware)	
	VLAN MIB	
	Spanning Tree Protocol MIB	
	Rapid STP MIB	
	Port-based Network Authentication Control MIB	
	Definitions of managed objects for LLDP	
	802.1/LLDP extension MIB	
	802.3/LLDP extension MIB	
	Radius Client MIB	
	IPv4 MIB	
	IGMP MIB	
	DHCP	

The management functions described above are supported by all Ethernet Switches with the name mCon xxxx-..V

HARTING mCon 3000 – Introduction and features

Ethernet Switch
HARTING mCon 3000

Ethernet Switches, managed,
for mounting onto top-hat mounting rail
in control cabinets

General Description

The fully Managed Ethernet Switches of the product family HARTING mCon 3000 enable the connection of up to 10 network devices (according to type) over Twisted Pair cables and fibre-optic cables (Multi- and Singlemode). The mCon 3000 Ethernet Switch family, with its integrated LEDs on each port, supports fast and easy network diagnosis.

The mCon 3000 Ethernet Switches are designed for an effective, industrial and individual use. They support both SNMP and an easy Web interface for management functions.

Features

- Ethernet Switch acc. to IEEE 802.3
- Store and Forward Switching Mode
- up to 10 ports, managed, non-blocking
- Auto-crossing, Auto-negotiation, Auto-polarity

Advantages

- Metal housing
- EMC, temperature range and mechanical stability meet the highest demands
- Integrated management functions

Application fields

- Industrial automation
- Automotive industry
- Wind power
- Power distribution systems

Technical characteristics

Ethernet interface RJ45

Number of ports	6x / 8x / 10x 10/100Base-T(X), 2x 10/100/1000Base-T(X)
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

Power supply

Input voltage	24 V DC
Termination	5-pole screw terminal, pluggable for redundant power supply
Diagnostics (via LED)	Power supply

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact

Design features

Housing material	Metal (powder coated)
Dimensions (W x H x D)	60 x 132 x 104 mm (incl. cap, without connectors)
Degree of protection acc. to DIN 60 529	IP 30
mCon xxxx-AE	IP 20
Mounting	• 35 mm top-hat rail acc. to EN 60 715 • Panel mounting, vertical assembly
Weight	approx. 0.6 kg

Environmental conditions

Operating temperature	0 °C … +70 °C / -40 °C ... +70 °C (mCon 3100 AAV only)
Storage temperature	–40 °C … +85 °C
Relative humidity	10 % … 95 % (non-condensing)

Technical characteristics - F.O. termination

Ethernet interface – F.O.

Number of ports	1x / 2x / 3x 100Base-FX
Cable types according to IEEE 802.3	Multimode fibre, 1300 nm; 50 / 125 µm or 62.5 / 125 µm
Data rate	100 Mbit/s
Maximum cable length	2000 m (Multimode)
Termination	SC-D female / ST female
Diagnostics (via LED)	• Status Link – Green • Data transfer (Act) – Green flashing
Wavelength	1300 nm
Transceive power T(X) max. (dynamic)	• -14 dBm (50 / 125 µm) • -14 dBm (62.5 / 125 µm)
Transmission power T(X) min.	• -23.5 dBm (50 / 125 µm) • -20 dBm (62.5 / 125 µm)
Receive power RX typical (dynamic)	• -33.9 dBm (window) • -35.2 dBm (centre)
Receive power RX max. (dynamic)	-14 dBm
Signal detection (dynamic)	-33 dBm
Topology	Line, Ring, Star or mixed

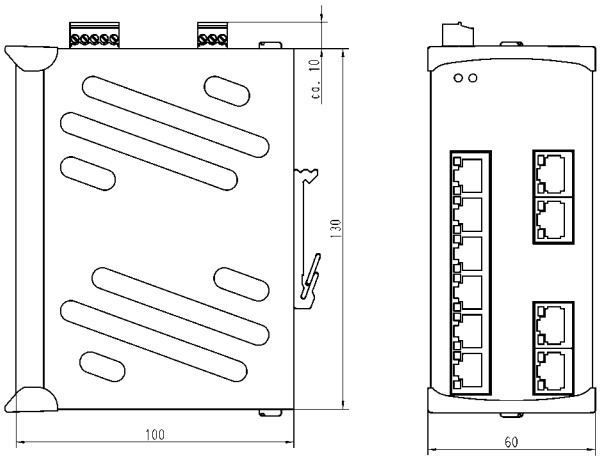
HARTING mCon 3000

Ethernet Switch
HARTING mCon 3100-AV

10-port Ethernet Switch 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	10x 10/100Base-T(X) / RJ45 (Twisted Pair)
Input voltage / Termination	24 V DC / 5-pole screw terminal, pluggable redundant power supply
Permissible range (min/max)	9.6 V … 36 V DC
Input current	approx. 190 mA (at 24 V DC)
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact
Housing material	Metal (powder coated)
Dimensions (W x H x D)	60 x 132 x 104 mm (incl. cap, without connectors)
Weight	approx. 0.6 kg
Operating temperature	0 °C … +70 °C
Approvals	UL 508
MTBF	625 000 h
Management	fully managed via Web interface and SNMP Functions see page ‘Management functions’

Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 3100-AV Ethernet Switch, managed 10 RJ45 ports including Set for assembly on standard rail	20 76 110 4002		

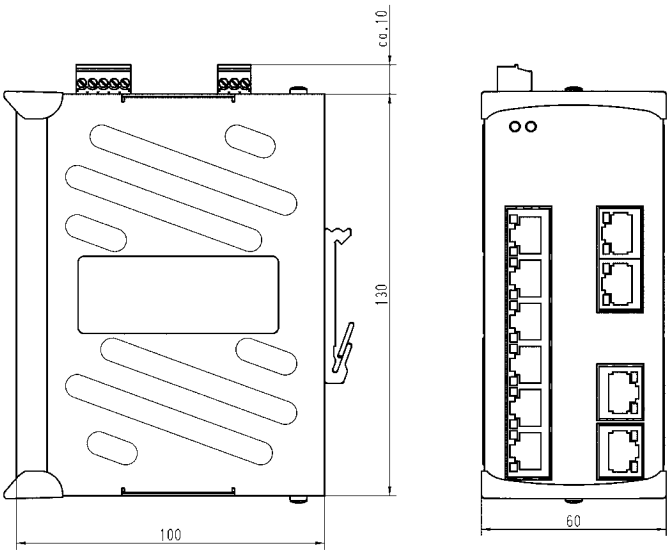
HARTING mCon 3000

Ethernet Switch
HARTING mCon 3100-AAV

10-port Ethernet Switch for mounting onto top-hat mounting rail
in control cabinets including 2 Gigabit ports;
with extended temperature range

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)
Input voltage / Termination	24 / 48 V DC / 5-pole screw terminal, pluggable redundant power supply
Permissible range (min/max)	9.6 V … 60 V DC
Input current	approx. 260 mA (at 24 V DC)
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact
Housing material	Metal (powder coated)
Dimensions (W x H x D)	60 x 132 x 104 mm (incl. cap, without connectors)
Weight	approx. 0.6 kg
Operating temperature	-40 °C … +70 °C
Approvals	cUL (in preparation)
MTBF	720 000 h
Management	fully managed via Web interface and SNMP Functions see page ‘Management functions’

Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 3100-AAV Ethernet Switch, managed 10 RJ45 ports including Set for assembly on standard rail	20 76 110 4003		

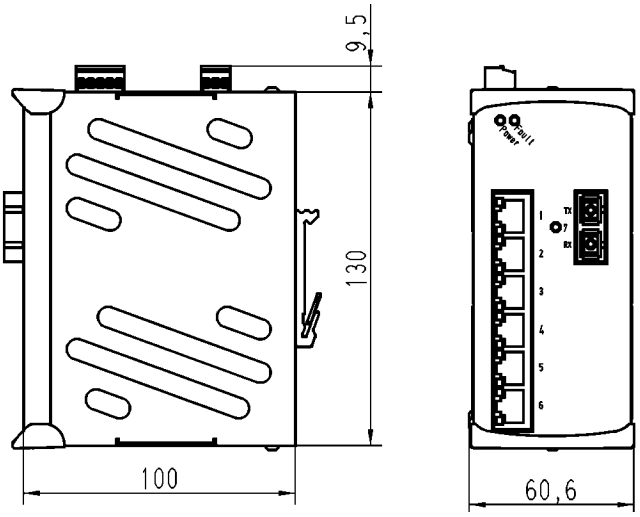
HARTING mCon 3000

Ethernet Switch
HARTING mCon 3061-ADV

7-port Ethernet Switch for mounting onto top-hat mounting rail
in control cabinets including 1 F.O. port (SC, MM)

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

Number of ports, Copper / Termination	6x 10/100Base-T(X) / RJ45 (Twisted Pair)
Number of ports, F.O. / Termination	1x 100Base-FX / SC-D female
Input voltage / Termination	24 V DC / 5-pole screw terminal, pluggable redundant power supply
Permissible range (min/max)	9.6 V … 36 V DC
Input current	approx. 270 mA (at 24 V DC)
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact
Housing material	Metal (powder coated)
Dimensions (W x H x D)	60 x 132 x 104 mm (incl. cap, without connectors)
Weight	approx. 0.6 kg
Operating temperature	0 °C … +70 °C
Approvals	UL 508
MTBF	710 000 h
Management	fully managed via Web interface and SNMP Functions see page ‘Management functions’

Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 3061-ADV Ethernet Switch, managed 6 RJ45 ports 1 SC port including Set for assembly on standard rail	20 76 107 4101		
ST variant see catalogue ‘Ethernet Network Solutions Automation IT’			

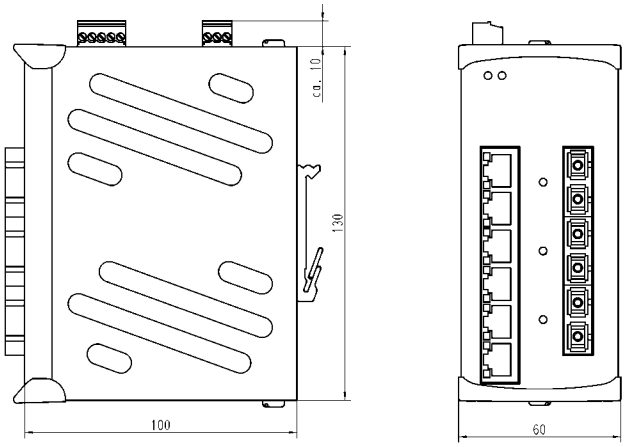
HARTING mCon 3000

Ethernet Switch
HARTING mCon 3063-ADV

9-port Ethernet Switch for mounting onto top-hat mounting rail
in control cabinets including 3 F.O. ports (SC, MM)

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

Number of ports, Copper / Termination	6x 10/100Base-T(X) / RJ45 (Twisted Pair)
Number of ports, F.O. / Termination	3x 100Base-FX / SC-D female
Input voltage / Termination	24 V DC / 5-pole screw terminal, pluggable redundant power supply
Permissible range (min/max)	9.6 V … 36 V DC
Input current	approx. 320 mA (at 24 V DC)
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact
Housing material	Metal (powder coated)
Dimensions (W x H x D)	60 x 132 x 104 mm (incl. cap, without connectors)
Weight	approx. 0.6 kg
Operating temperature	0 °C … +70 °C
Approvals	UL 508
MTBF	710 000 h
Management	fully managed via Web interface and SNMP Functions see page ‘Management functions’

Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 3063-ADV Ethernet Switch, managed 6 RJ45 ports 3 SC ports including Set for assembly on standard rail	20 76 109 4101		
ST variant see catalogue ‘Ethernet Network Solutions Automation IT’			

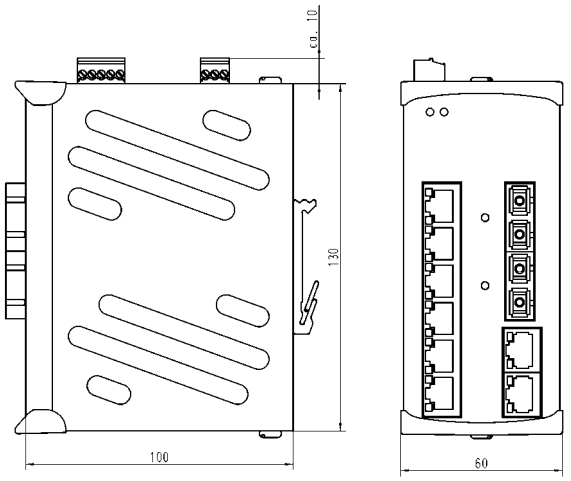
HARTING mCon 3000

Ethernet Switch
HARTING mCon 3082-ADV

10-port Ethernet Switch for mounting onto top-hat mounting rail
in control cabinets including 2 F.O. ports (SC, MM)

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

Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair)
Number of ports, F.O. / Termination	2x 100Base-FX / SC-D female
Input voltage / Termination	24 V DC / 5-pole screw terminal, pluggable redundant power supply
Permissible range (min/max)	9.6 V … 36 V DC
Input current	approx. 290 mA (at 24 V DC)
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact
Housing material	Metal (powder coated)
Dimensions (W x H x D)	60 x 132 x 104 mm (incl. cap, without connectors)
Weight	approx. 0.6 kg
Operating temperature	0 °C … +70 °C
Approvals	UL 508
MTBF	560 000 h
Management	fully managed via Web interface and SNMP Functions see page ‘Management functions’

Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 3082-ADV Ethernet Switch, managed 8 RJ45 ports 2 SC ports including Set for assembly on standard rail	20 76 110 4101		
ST variant see catalogue ‘Ethernet Network Solutions Automation IT’			

HARTING mCon 4000 – Introduction and features

Ethernet Switch
HARTING mCon 4000
Ethernet Switches, managed,
for flat wall mounting

General Description

The Fast Ethernet Switches of the product family HARTING mCon 4000 are recommended for use in the widest range of industrial applications and support Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s). The product family enables the connection of up to 8 network devices over Twisted Pair cables.

Mechanical stability and temperature range meet the highest demands. The robust M12 interface shows its adantages especially in applications at risk of vibrations.

The Ethernet Switches support both SNMP and an easy Web interface for management functions.

Features

- Ethernet Switch according to IEEE 802.3
- Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s)
- Auto-crossing
- Auto-negotiation
- Auto-polarity
- Store and Forward Switching Mode, non blocking
- Diagnostic LEDs (Link status, Data, Power)
- Mounting onto wall,
  optionally onto top-hat mounting rail

Advantages

- Robust metal housing and flat housing style
- EMC, temperature range and mechanical stability meet the highest demands
- Wide range for power supply input
- Wide range for type test according to EN 50 155 and EN 50 121-3-2

Application fields

- Railway applications
- Industrial automation
- Automotive industry
- Wind power

Technical characteristics

Ethernet interface

Number of ports	8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s
Maximum cable length	100 m (Twisted Pair; with Category 5 cable acc. to DIN EN 50 173-1)
Termination	M12 D-coding
Diagnostics (via LED)	• Status Link – ON • Data transfer (Act) – flashing • Data transfer rate (Speed) – 100 Mbit/s: Yellow / 10 Mbit/s: Green • Error – Red
Topology	Line, Ring, Star or mixed

Power supply

Input voltage	
mCon 4080-B1V	24 / 48 V DC
mCon 4080-B3V	72 / 110 V DC
Termination	M12 A-coding, male, for redundant power supply
Diagnostics (via LED)	Power supply

Design features

Housing material	Metal (powder coated)
Dimensions (W x H x D)	130 x 166 x 50 mm
Degree of protection acc. to DIN 60 529	IP 40
Mounting	Wall mounting, flat
Weight	approx. 0.85 kg

Environmental conditions

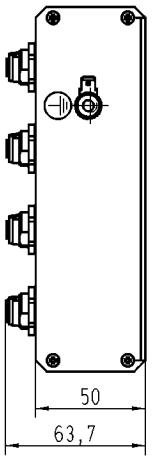
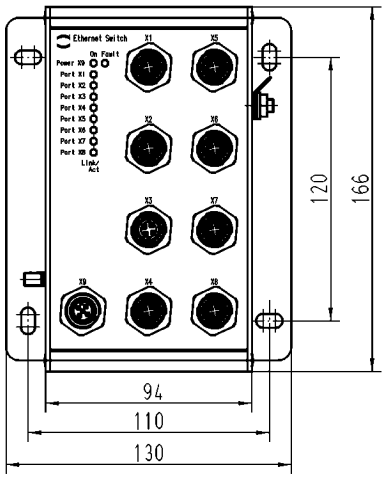
Operating temperature	–40 °C … +70 °C
Storage temperature	–40 °C … +85 °C
Relative humidity	10 % … 95 % (non-condensing)

Ethernet Switch
HARTING mCon 4080-B1V

8-port Ethernet Switch for flat installation

Managed	IP 40	PROFINET compatible [X]	EtherNet/IP compatible [X]

Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply
Permissible range (min/max)	12 V … 60 V DC
Input current	approx. 165 mA (at 24 V DC)
Housing material	Metal (powder coated)
Dimensions (W x H x D)	130 x 166 x 50 mm
Weight	approx. 0.85 kg
Operating temperature	–40 °C … +70 °C
Approvals	cUL (in preparation)

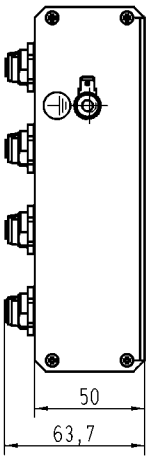
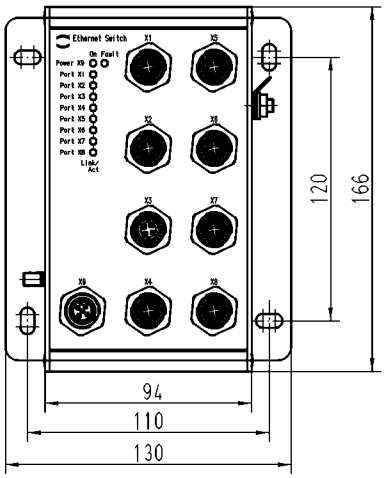
Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 4080-B1V Ethernet Switch, managed, with 8 ports M12 D-coding for wall mounting	20 77 208 4001		

Ethernet Switch
HARTING mCon 4080-B3V

8-port Ethernet Switch (110 V DC) for flat installation

Managed	IP 40	PROFINET compatible [X]	EtherNet/IP compatible [X]

Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding
Input voltage / Termination	72 / 110 V DC / M12 A-coding, male, for redundant power supply
Permissible range (min/max)	50.4 V … 137.5 V DC
Input current	approx. 48 mA (at 110 V DC)
Housing material	Metal (powder coated)
Dimensions (W x H x D)	130 x 166 x 50 mm
Weight	approx. 0.85 kg
Operating temperature	–40 °C … +70 °C
Approvals	cUL (in preparation)

Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 4080-B3V Ethernet Switch, managed, 110 V DC with 8 ports M12 D-coding for wall mounting	20 77 208 4003		

Ethernet Switch
HARTING mCon 9000

Ethernet Switch, managed, for installation in a 19'' rack

General Description

The Ethernet Switches of the product family HARTING mCon 9000 are recommended for use in the widest range of industrial applications and support Ethernet (10 Mbit/s), Fast Ethernet (100 Mbit/s) and Gigabit Ethernet (1000 Mbit/s). The product family enables the connection of up to 10 network devices over Twisted Pair cables or F.O. cables. Optionally for some mCon 9000 Ethernet Switches additional end-devices can be connected via the DIN male connector.

The mCon 9000 Ethernet Switch family, with its integrated LEDs on each port, supports fast and easy network diagnosis. The mCon Ethernet Switch operates in Store and Forward Switching mode and supports Auto-crossing, Auto-negotiation and Auto-polarity.

Features

- Ethernet Switch acc. to IEEE 802.3
- Store and Forward Switching Mode, non-blocking
- Auto-crossing, Auto-negotiation, Auto-polarity
- Ethernet (10 Mbit/s), Fast Ethernet (100 Mbit/s) and Gigabit Ethernet (1000 Mbit/s)
- Diagnostic LEDs (Link status, Data, Power)
- Pluggable in 19“ racks
- mCon 9070-BV:
  Power input on the front
  no backplane necessary

Advantages

- Robust metal housing
- Management function integrated
- EMC, temperature range and mechanical stability meet the highest demands
- PROFINET compatible

Application fields

- Industrial automation
- Railway applications
- Automotive industry
- Wind power
- Power distribution systems

Technical characteristics M12 D-coding

Ethernet interface

Number of ports	7x / 8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (RJ45)
Maximum cable length	100 m (Twisted Pair; with Category 5 cable acc. to DIN EN 50 173-1)
Termination, front	M12 D-coding
Diagnostics (via LED)	• Status Link – Green • Data transfer (Act) – Green flashing • Data transfer rate (Speed) – 100 Mbit/s: Yellow / 10 Mbit/s: OFF
Topology	Line, Ring, Star or mixed

Power supply

Input voltage	24 / 48 V DC (8 … 60 V DC)
Diagnostics (via LED)	Power supply

Alarm signalling contact (mCon 9080-BV only)	Change-over contact, potential-free, 24 V DC / 0.5 A

Design features

Housing material	Aluminium, anodised
Degree of protection acc. to DIN 60 529	IP 20 (front side IP 40, when mounted)
Mounting	19“ rack, 3 U
Weight	approx. 0.6 kg

Environmental conditions

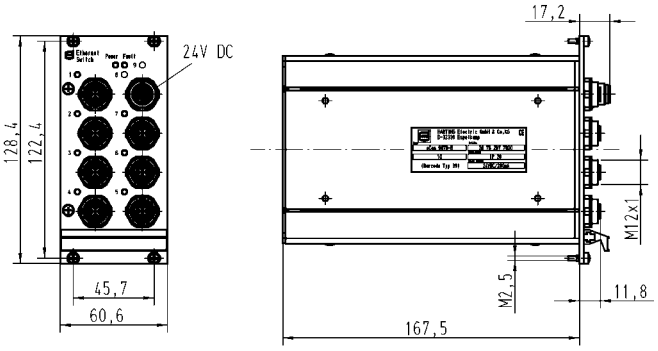
Operating temperature	–40 °C … +70 °C
Storage temperature	–40 °C … +85 °C
Relative humidity	10 % … 95 % (non-condensing)

Ethernet Switch
HARTING mCon 9070-BV

7-port Ethernet Switch for installation in a 19'' rack

Managed	IP 20	PROFINET compatible X	EtherNet/IP compatible X

Number of ports, Copper / Termination	7x 10/100Base-T(X) / M12 D-coding
Input voltage / Termination	24 / 48 V DC / M12 A-coding (on front side)
Permissible range (min/max)	8 V … 60 V DC
Input current	approx. 130 mA (at 24 V DC)
Housing material	Aluminium, anodised
Dimensions (W x H x D)	60.6 mm (12 HP) x 128.4 mm (3 U) x 173.5 mm
Weight	approx. 0.6 kg
Operating temperature	–40 °C … +70 °C
Approvals	cUL (in preparation)
Management	fully managed via Web interface and SNMP Functions see page 'Management functions'

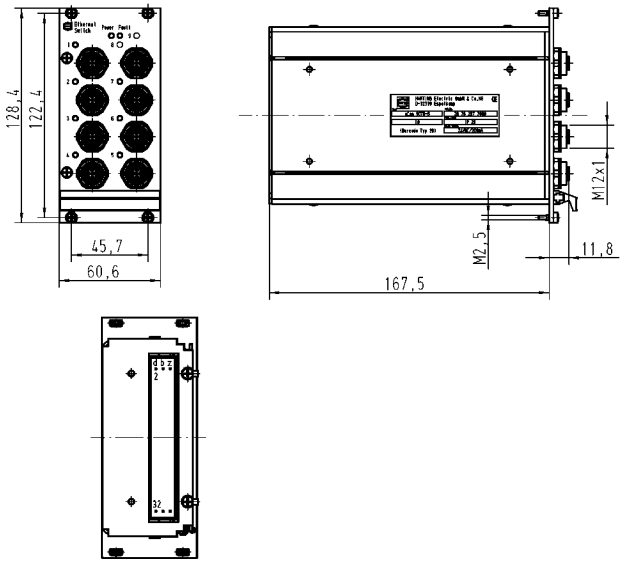
Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 9070-BV Ethernet Switch, managed 7 ports, M12 D-coding	20 76 207 7002		

Ethernet Switch
HARTING mCon 9080-BV

8-port Ethernet Switch for installation in a 19'' rack

Managed	IP 20	PROFINET compatible ☒	☐

Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding
Input voltage / Termination	24 / 48 V DC / DIN frame connector, Type F
Permissible range (min/max)	8 V … 60 V DC
Input current	approx. 130 mA (at 24 V DC)
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A
Housing material	Aluminium, anodised
Dimensions (W x H x D)	60.6 mm (12 HP) x 128.4 mm (3 U) x 173.5 mm
Weight	approx. 0.6 kg
Operating temperature	–40 °C … +70 °C
Approvals	cUL (in preparation)
Management	fully managed via Web interface and SNMP Functions see page 'Management functions'

Identification	Part number	Drawing	Dimensions in mm
HARTING mCon 9080-BV Ethernet Switch, managed 8 ports M12 D-coding	20 76 208 7002		

Industrial cable 8-wire, Cat. 5, trailing PUR

Industrial cable
8-wire, Cat. 5, trailing PUR

Advantages

- Suitable for generic cabling Category 5 / Class D according ISO/IEC 11 801 respectively EN 50 173-1 especially for high-flexible installation (patch cords)
- Qualified for transmission up to 1 GigaBit Ethernet 1000Base-T acc. IEEE802.3ab
- Based on stranded copper wires AWG 26/19 delivers patch cord performance up to 100 MHz
- Applicable for industrial premises
- Usable as trailing cables
- Double jacket allows easy-stripping and delivers very short assembling time
- Good EMC capability based on fully screen design
- Flame retardant, halogen free and RoHS compliant

General

This high-speed data cable was designed for higher flexible installation in drag-chains and it's especially suitable for termination of HARTING RJ45 data plugs in IP 20 as well as in IP 65 / IP 67.

The four pair / eight wire TP construction allows the transmission of IT digital and analogue signals like Ethernet 10/100 Mbit/s, 1 GigaBit/s, video and voice services as well as IP-based data services.

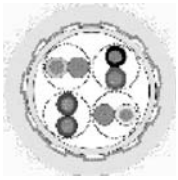
It offers all characteristics to complete a generic cabling system according ISO/IEC 24 702:2006 respectively EN 50 173-3:2007. Maximum patch cord length specified up to 20 m (part of transmission channel class D)

Transmission performance meets Cat. 5 specification up to 100 MHz for 1 GigaBit Ethernet transmission according IEEE802.3ab.

The cable is fully screened by an overall wire braid and guaranties a very protective signal transmission and high EMC performance.

PUR is used as jacket material. The cable is flame retardant, halogen free and RoHS compliant.

Identification		Part number
Industrial Cable 8-wire, Cat. 5, trailing PUR		
20 m	ring	09 45 600 0136
50 m	ring	09 45 600 0146
100 m	ring	09 45 600 0106
500 m	reel	09 45 600 0156



- Wire: bare stranded copper, AWG 26/19
- Insulation: PE, Ø 1.0 mm
- Color code: gr/or, bl/rd, gn/ye, bl/br
- Inner jacket: EPDM
- Overall screen: tinned copper wire braid, braid coverage about 90 %
- Outer sheath: Polyurethane (PUR), flame retardant, halogen free, lead free
- Color of inner sheath: white
- Color of outer sheath: yellow, RAL 1021
- Overall diameter: 6.8 mm

Technical characteristics

Performance	Category 5/5e according to EN 50288-2-2:2004 / IEC 61156-6:2002
Mechanical characteristics	
Minimal bending radius	Repeated bending: 5 x diameter
Tensile strength	max. 60 N
Crush	2000 N / 100 mm
Electrical characteristics at 20 °C	
Transfer impedance 10 MHz	25 mOhm / m
Coupling attenuation up to 1000 MHz	75 dB
Conductor resistance	max. 130 Ohm / km
Insulation resistance	min. 5 GOhm*km
Mutual capacitance	50 pF / m
Signal velocity	0.68 c
Propagation delay	490 ns / 100 m
Skew (delay skew) at 100 MHz	15 ns / 100 m
Characteristic impedance at 100 MHz	100 Ohm ± 5 Ohm
Test voltage	1000 V
Operating voltage	max. 125 V
Chemical characteristics	
Flame retardant	IEC 60332-2-2
Calorific value	0.7 MJ / m
Free of hazardous substances	RoHS 2002/95/EG
Thermal characteristics	
Permissible temperature range	
Flexible operation	0 °C up to + 50 °C
Fix operation	- 40 °C up to + 85 °C
Printing	HARTING INDUSTRIAL CABLE SF/UTP ES CAT 5 PUR trailing 4x2xAWG 26/19 094560001050100 “Production lot code” “Meter marking”
Weight about	58 kg / km

Technical characteristics

Frequency MHz	Attenuation dB / 10 m		NEXT dB		PS NEXT dB		ACR dB@10 m		PS ACR dB@10 m		EL FEXT dB@10 m		PS EL FEXT dB@10 m		Return Loss dB	
	typ.	Cat 5 max*	typ.	Cat 5 min*	typ.	Cat 5 min*	typ.	Cat 5 min*	typ.	Cat 5 min*	typ.	Cat 5 min*	typ.	Cat 5 min*	typ.	Cat 5 min*
1	0.22	0.32	80	65	77	62	80	65	77	62	80	64	77	61	17	-
4	0.56	0.6	67	56	64	53	67	56	64	53	69	52	66	49	26	23
10	1.0	1.05	63	50	60	47	62	49	59	47	61	44	65	41	30	25
16	1.35	1.45	61	47	58	44	60	46	57	44	56	40	53	37	30	25
20	1.5	1.6	59	46	56	43	58	44	55	43	53	38	50	35	30	25
31.25	1.95	2.0	57	43	54	40	55	41	52	40	48	34	45	31	30	23.6
62.5	2.95	3.0	52	38	49	35	50	36	47	35	43	28	40	25	28	21.5
100	3.95	4.0	45	35	42	32	42	32	39	32	38	24	35	21	26	20.1

* according to EN 50288-2-2:2004 / IEC 61156-6:2002

HARTING RJ Industrial® IP 20 Patch cable
Cat. 5 / Cat. 5e

Advantages

- Suitable for Gigabit Ethernet 1000 Mbit/s
- Compact and space saving plug by HARTINGs dual boot design
- Capable for multiport applications
- Very robust locking lever protection and unlocking latch
- Flame retardant and halogen-free

General

The new Cat. 5 patch cables complete HARTINGs Automation IT generic cabling system and are part of the new patch cord family. The family is marked by an unique design of the two part boot – called dual boot design. They are made for industrial environments and therefore robust and flame retardant.

The dual boot design offers a very robust handling and bending protection. Standard compliant according to ISO/IEC 24 702 resp. ISO/IEC 11 801 Cat. 5 100 MHz.

Identification		Part No.
IP 20 Patch cable Cat. 5 / Cat. 5e		
Length:	0.2 m	09 47 474 7001
	0.3 m	09 47 474 7002
	0.4 m	09 47 474 7003
	0.5 m	09 47 474 7004
	0.6 m	09 47 474 7005
	0.7 m	09 47 474 7006
	0.8 m	09 47 474 7007
	0.9 m	09 47 474 7008
	1.0 m	09 47 474 7009
	1.5 m	09 47 474 7010
	2.0 m	09 47 474 7011
	2.5 m	09 47 474 7012
	3.0 m	09 47 474 7013
	4.0 m	09 47 474 7014
	5.0 m	09 47 474 7015
	6.0 m	09 47 474 7016
	7.0 m	09 47 474 7017
	7.5 m	09 47 474 7018
	8.0 m	09 47 474 7019
	9.0 m	09 47 474 7020
	10.0 m	09 47 474 7021
	15.0 m	09 47 474 7022
	20.0 m	09 47 474 7023

- RJ45 acc. to IEC 60 603-7
- Boot grey
- Locking lever protection and unlocking latch
- Cable SF/UTP AWG 26/7
- PUR chemical resistant cable jacket, yellow
- Wiring: 1:1 TIA/EIA-568-B, 8-wire
- 100 % electrical tested

Technical characteristics

Performance	Cat. 5 / Class D acc. to ISO/IEC 24 702 resp. ISO/IEC 11 801, Cat. 5e acc. to IEC 61 935-2, TIA/EIA-568-B
Mechanical characteristics	
Bending protection	
Locking lever protection	
Electrical characteristics	
Characteristic impedance	100 Ohm
Wiring	1:1 TIA/EIA-568-B
EMC	Fully shielded (aluminised foil and tinned cupper braid)
Environmental characteristics	
Protection class	IP 20
Halogen-free	IEC 60 754-2
Flame retardant	IEC 60 332-1
Low smoke density	IEC 61 034
Lead free	LSZH and RoHS compliant
Thermal characteristics	
Operating temperature	
Flexible operation	0 °C up to + 60 °C
Fix operation	- 40 °C up to + 80 °C
Tolerance cable length	From 0.2 m up to 5.0 m + 0.07 m From 6.0 m up to 20.0 m ± 1 %
Printing	RJI cable 8AWG 26/7, Cat. 5e PUR
Packaging	One piece in poly-bag labelled

HARTING RJ Industrial® IP 20
Patch cable Cat. 6

Advantages

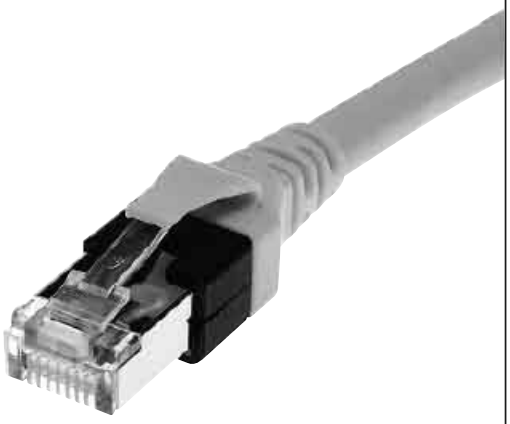
- Suitable for Gigabit Ethernet 1000 Mbit/s and beyond
- Compact and space saving plug by HARTINGs dual boot design
- Capable for multiport applications
- Very robust locking lever protection and unlocking latch
- Flame retardant and halogen-free

General

The new Cat. 6 patch cables complete HARTINGs Automation IT generic cabling system and are part of the new patch cord family. The family is marked by an unique design of the two part boot – called dual boot design. They are made for industrial environments and therefore robust and flame retardant.

The dual boot design offers a very robust handling and bending protection. Standard compliant according to ISO/IEC 24 702 resp. ISO/IEC 11 801 Cat. 6 250 MHz.

Identification		Part No.
IP 20 Patch cable Cat. 6		
Length:	0.2 m	09 47 474 7101
	0.3 m	09 47 474 7102
	0.4 m	09 47 474 7103
	0.5 m	09 47 474 7104
	0.6 m	09 47 474 7105
	0.7 m	09 47 474 7106
	0.8 m	09 47 474 7107
	0.9 m	09 47 474 7108
	1.0 m	09 47 474 7109
	1.5 m	09 47 474 7110
	2.0 m	09 47 474 7111
	2.5 m	09 47 474 7112
	3.0 m	09 47 474 7113
	4.0 m	09 47 474 7114
	5.0 m	09 47 474 7115
	6.0 m	09 47 474 7116
	7.0 m	09 47 474 7117
	7.5 m	09 47 474 7118
	8.0 m	09 47 474 7119
	9.0 m	09 47 474 7120
	10.0 m	09 47 474 7121
	15.0 m	09 47 474 7122
	20.0 m	09 47 474 7123



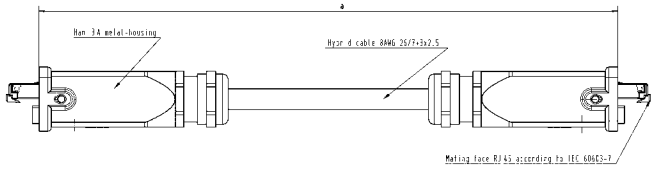
- RJ45 acc. to IEC 60 603-7
- Boot black
- Locking lever protection and unlocking latch
- Cable S/FTP AWG 26/7
- PUR chemical resistant cable jacket, yellow
- Wiring: 1:1 TIA/EIA-568-B, 8-wire
- 100 % electrical tested

Technical characteristics

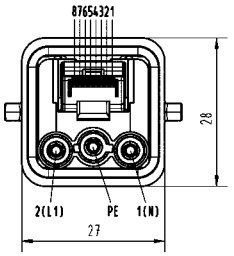
Performance	Cat. 6 / Class E acc. to ISO/IEC 24 702 resp. ISO/IEC 11 801, Cat. 6 acc. to IEC 61 935-2 Note: Basically patch cords are standardised up to lengths of 10 m. For all lengths beyond RL are specified for 2 MHz < f < 250 MHz.
Mechanical characteristics	
Bending protection	
Locking lever protection	
Electrical characteristics	
Characteristic impedance	100 Ohm
Wiring	1:1 TIA/EIA-568
EMC	Fully shielded (aluminised foil and tinned cupper braid)
Environmental characteristics	
Protection class	IP 20
Lead free	LSZH and RoHS compliant
Flame retardant	IEC 60 332-1
Thermal characteristics	
Operating temperature	
Flexible operation	0 °C up to + 60 °C
Fix operation	- 20 °C up to + 80 °C
Tolerance cable length	From 0.2 m up to 5.0 m + 0.07 m From 6.0 m up to 20.0 m ± 1 %
Printing	RJI cable 8AWG 26/7, Cat. 6 PUR
Packaging	One piece in poly-bag labelled

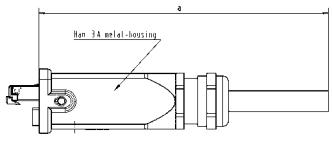
Hybrid cable assembly
Han® 3 A hybrid RJ45

Identification	Part No.	Drawing	Dimensions in mm
Hybrid cable, double ended, 4 x 2 x AWG 26/7 + 3 x 2.5 mm²		double ended	
Length: 1 m			
AC version	33 57 211 0010 001		
DC version	33 57 211 0010 002		
Length: 5 m			
AC version	33 57 211 0050 001		
DC version	33 57 211 0050 002		
Length: 10 m			
AC version	33 57 211 0100 001		
DC version	33 57 211 0100 002		
Length: 20 m			
AC version	33 57 211 0200 001		
DC version	33 57 211 0200 002		
Hybrid cable, single ended, 4 x 2 x AWG 26/7 + 3 x 2.5 mm²		Protection level: IP 65 / IP 67	
Length: 1 m			
AC version	33 57 111 0010 002		
DC version	33 57 111 0010 001		
Length: 5 m		Data part: Transmission properties in accordance with ISO/IEC 11 801:2002: Class D	
AC version	33 57 111 0050 002		
DC version	33 57 111 0050 001		
Length: 10 m		single ended	
AC version	33 57 111 0100 002		
DC version	33 57 111 0100 001		
Length: 20 m			
AC version	33 57 111 0200 002		
DC version	33 57 111 0200 001		
Hybrid outdoor cable		PVC jacket	
Length: 10 m	33 57 851 0100 001	4 x 2 x AWG 26/7 + 3 x 2.5 mm²	
Length: 20 m	33 57 851 0200 001	Outer diameter: 12 mm	
Length: 500 m	33 57 851 5000 001	Min. bending radius: single: 5 x OD, repeated: 10 x OD	



a = length



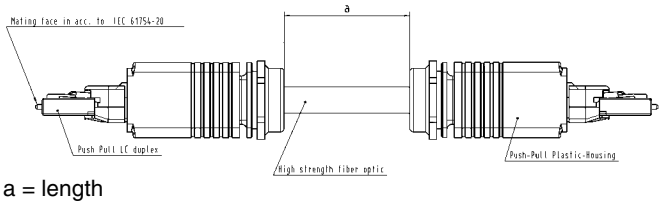


a = length

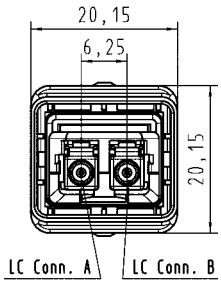
Further cable lengths are available on request

Fibre optic cable assembly
HARTING PushPull LC duplex multimode

Identification	Part No.	Drawing	Dimensions in mm
Fibre optic cable, double ended, multimode, 62.5 µm		double ended	
Length: a = 1 m	33 58 211 0010 001		
a = 5 m	33 58 211 0050 001		
a = 10 m	33 58 211 0100 001		
a = 20 m	33 58 211 0200 001		
a = 40 m	33 58 211 0400 001		
a = 50 m	33 58 211 0500 001		
a = 100 m	33 58 211 1000 001		
Fibre optic cable, single ended, multimode, 62.5 µm			
Length: a = 1 m	33 58 111 0010 001		
a = 5 m	33 58 111 0050 001		
a = 10 m	33 58 111 0100 001		
a = 20 m	33 58 111 0200 001		
a = 40 m	33 58 111 0400 001		
a = 50 m	33 58 111 0500 001		
a = 100 m	33 58 111 1000 001		
Fibre optic breakout cable			
Length: 10 m	33 58 751 0100 001		
Length: 20 m	33 58 751 0200 001		
Length: 100 m	33 58 751 1000 001		

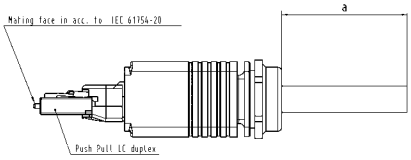


a = length

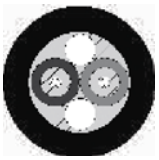


Protection level: IP 65 / IP 67

single ended



a = length



PUR jacket

2-fibre multimode	62.5 µm
Outer diameter:	7 mm
Min. bending radius:	
Installation:	10.5 cm
Operating:	7.0 cm

Further cable lengths are available on request

Hybrid fibre optic cable assembly
Han® 3 A hybrid LC duplex multimode

Identification	Part No.	Drawing	Dimensions in mm
Hybrid fibre optic cable, multimode, double ended 2 x G50/125 + 3 x 2.5/3.5 mm²		double ended	
Length: 1 m			
AC version	33 57 211 0015 001		
DC version	33 57 211 0015 002		
Length: 5 m			
AC version	33 57 211 0055 001		
DC version	33 57 211 0055 002		
Length: 10 m			
AC version	33 57 211 0105 001		
DC version	33 57 211 0105 002		
Length: 20 m			
AC version	33 57 211 0205 001		
DC version	33 57 211 0205 002		
		a = length	
		Protection level: IP 65 / IP 67	
Hybrid fibre optic cable, multimode, single ended 2 x G50/125 + 3 x 2.5/3.5 mm²		single ended	
Length: 1 m			
AC version	33 57 111 0015 001		
DC version	33 57 111 0015 002		
Length: 5 m			
AC version	33 57 111 0055 001		
DC version	33 57 111 0055 002		
Length: 10 m			
AC version	33 57 111 0105 001		
DC version	33 57 111 0105 002		
Length: 20 m			
AC version	33 57 111 0205 001		
DC version	33 57 111 0205 002		
		a = length	

Further cable lengths are available on request

Part No.	**09 89 040 0000**
Technical characteristics	
Drive	electro-mechanical, servo
Press-in force	100 kN
max. PCB dimensions	600 x 1000 mm
Floor space	1200 x 1150 mm
Weight	980 kg
Power supply	208 / 380 / 400 / 415 V
Consumption	< 1 kW
Colour	on request

CPM *prestige*
(incl. PC, control software, barcode reader, keyboard, touch screen)

The **CPM *prestige*** press-in machine with a graphical user interface

The **CPM *prestige*** is a consequential development of the successful CPM 2001 press-in machines. The excellent design, supported by a wide range of tools presents a convenient, easy and comfortable way of processing backplanes and daughter cards. The machine is fully programmable and is supplied with a graphical user interface for control and visualisation of the complete process. The use of a microprocessor control allows the recognition and storage of different component heights, so that the pressing-in of different components is initiated simultaneously with only one button. The user-friendly touch-screen guides the user through the menu-orientated process controls.
The visualisation of the entire press-in process (the position of the connector, press-in forces etc.) allows the rapid recognition and elimination of possible error sources. The machine employs the automatic switch-off system “autosense”, known worldwide for its reliability. The different connector types and the tolerances of the PCB are automatically recognised and taken into consideration at the press-in operation, thus maximising the process security. The press-in force of 100 kN allows to process more than one connector per press-in stroke and achieves a high efficiency.
The extensive operation monitor functions simplify the service and support of the machine. The embedded PC-system guaranties near 100% availability.

Quality control of press-in termination

The press-in force correlates with the diameter of the plated through hole and with the friction coefficient of the surface; therefore it can be used for a continuous monitoring of the process. The retention force, as an indirect measure of the normal force, serves to qualify the process.

Features:
- Guiding rails (carbon / spring-loaded) for the secure positioning of the PCB
- Touch-screen with integrated embedded PC (no moving parts inside)
- All dimensions allow an easy integration into production lines

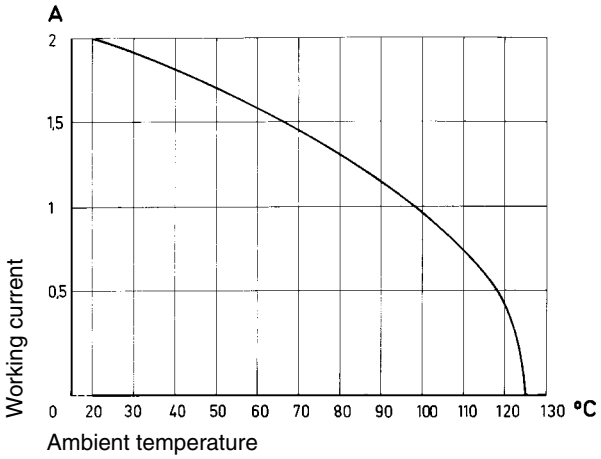
Process monitoring and quality assurance:
- Touch screen interface with graphical and verbal menus for all machine functions
- Autosense: automated press-in interruption at incorrect press-in forces
- Storage and validation of all press-in parameters via quality assurance software (press-in force tolerances)
- Continuous high-precision measurement and recording of press-in forces and distances
- High flexibility through a modular tool range

Number of contacts	20-96
Contact spacing (mm)	2.54
Working current	2 A max.
see current carrying capacity chart	
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	≤ 15 mΩ
Insulation resistance	≥ 10^{12} Ω
Temperature range	– 55 °C … + 125 °C
The higher temperature limit includes the local ambient and heating effects of the contacts under load	– 40 °C … + 105 °C for press-in connectors
During reflow soldering	max. + 240 °C for 15 s for SMC connectors
Electrical termination	
Male and female connectors	Solder pins for PCB connections Ø 1.0 ± 0.1 mm according to IEC 60 326-3 Compliant press-in terminations
Diameter of PCB plated through holes	see table on the right
PCB thickness	≥ 1.6 mm
Recommended PCB holes for press-in process in acc. to EN 60 352-5	
Insertion and withdrawal force	20way ≤ 20 N 30way ≤ 30 N 32way ≤ 30 N 48way ≤ 45 N 64way ≤ 60 N 96way ≤ 90 N
Materials	
Mouldings	Poly Cyclohexylene Terephthalate (PCT), 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



Recommended configuration of plated through holes

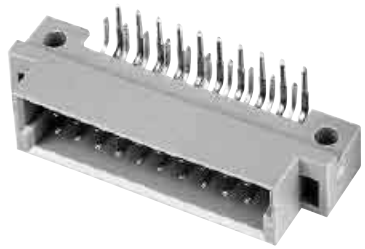
In addition to the hot-air-level (HAL) other PCB surfaces are getting more important. Due to their different properties, such as mechanical strength and coefficient of friction we recommend the following configuration of PCB through holes.

Tin-lead plated PCB (HAL) acc. EN 60 352-5	Hole-Ø	$1.15^{\pm 0.025}$ mm
	Cu	min. 25 µm
	Sn	max. 15 µm
	Plated hole-Ø	0.94-1.09 mm
Chemical tin-plated PCB	Hole-Ø	$1.15^{\pm 0.025}$ mm
	Cu	min. 25 µm
	Sn	min. 0.8 µm
	Plated hole-Ø	1.00-1.10 mm
Au / Ni plated PCB	Hole-Ø	$1.15^{\pm 0.025}$ mm
	Cu	min. 25 µm
	Ni	3-7 µm
	Au	0.05-0.12 µm
	Plated hole-Ø	1.00-1.10 mm
Silver plated PCB	Hole-Ø	$1.15^{\pm 0.025}$ mm
	Cu	min. 25 µm
	Ag	0.1-0.3 µm
	Plated hole-Ø	1.00-1.10 mm
OSP copper plated PCB	Hole-Ø	$1.15^{\pm 0.025}$ mm
	Cu	min. 25 µm
	Plated hole-Ø	1.00-1.10 mm

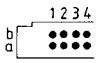
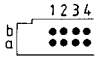
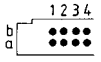
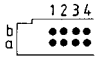
PCB board thickness: ≥ 1.6 mm

Number of contacts

20

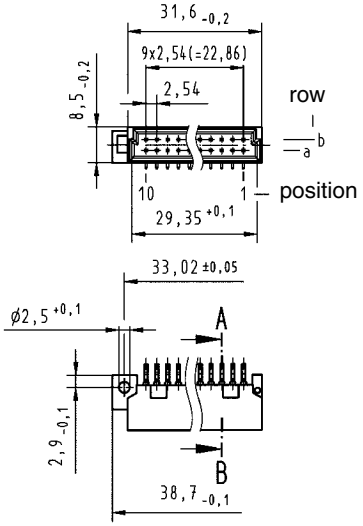


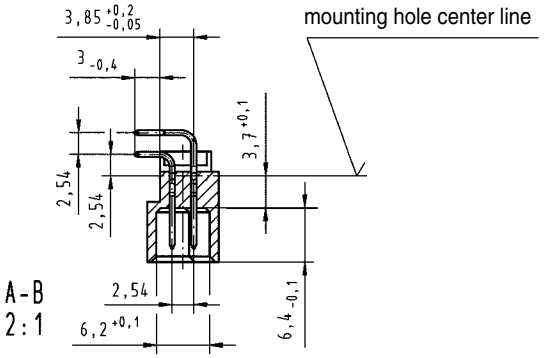
Male connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Male connector with angled solder pins					
with fixing flange	20		Performance level 3 on request	09 24 120 6921	Performance level 1 on request
with fixing flange, SMC	20			09 24 120 6919	
without fixing flange	20			09 24 120 6571	
without fixing flange, SMC	20			09 24 120 6579	

Dimensions

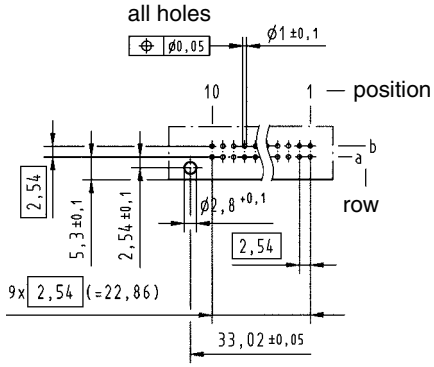
with fixing flange without fixing flange



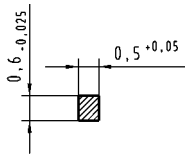


Board drillings

Mounting side



Cross section of solder terminations



Cross area (A) of contacts
row a, b: A = 0.29 - 0.33 mm²

Dimensions in mm

Number of contacts

20

Female connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Female connector with solder pins 2.9 mm					
with fixing flange	20			09 24 220 6824	
with fixing flange, SMC	20			09 24 220 6841	
without fixing flange, SMC	20			09 24 220 6414	
Female connector with solder pins 4.5 mm			Performance level 3 on request		Performance level 1 on request
with fixing flange	20			09 24 220 6825	
Female connector with press-in pins 4.5 mm					
with fixing flange	20			09 24 220 6850	
without fixing flange	20			09 24 220 6870	

Number of contacts

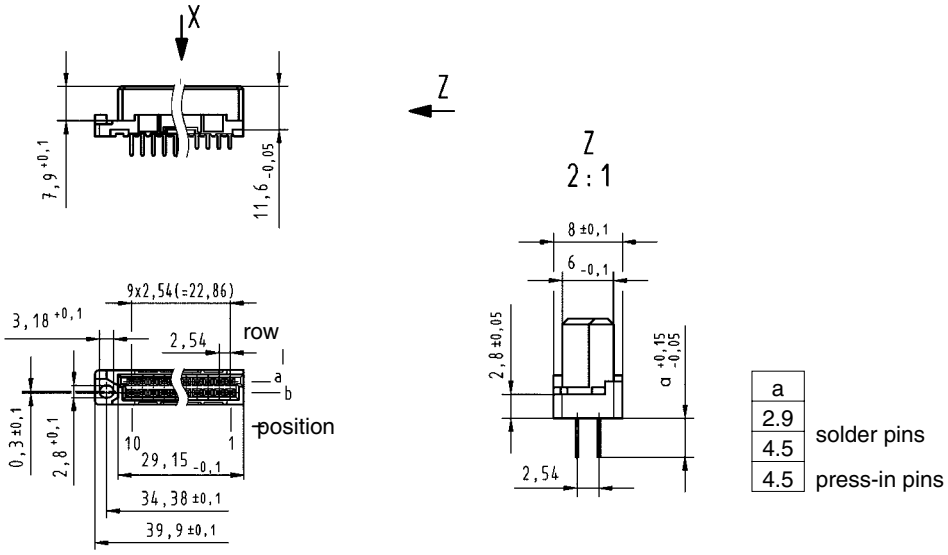
20

Female connectors

Identification	Drawing	Dimensions in mm

Dimensions

with fixing flange without fixing flange

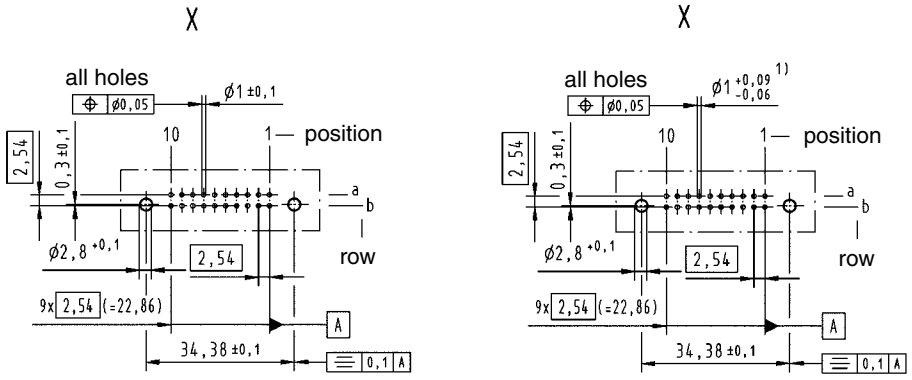


a	
2.9	solder pins
4.5	solder pins
4.5	press-in pins

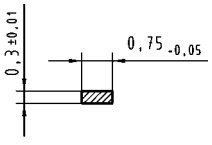
Board drillings

Mounting side

solder pins press-in pins



Cross section of solder terminations



Cross area (A) of contacts row a, b: A = 0.20 - 0.23 mm²

1) for press-in connection acc. to IEC 60352-2

Number of contacts

30, 20

Male connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Male connector with angled solder pins					
with fixing flange	30			09 25 130 6921	
	20			09 25 120 6921	
with fixing flange, SMC	30			09 25 130 6919	
without fixing flange	30			09 25 130 6571	
without fixing flange, SMC	30			09 25 130 6579	
			Performance level 3 on request		Performance level 1 on request
Male connector with straight solder pins					
with fixing flange	30			09 25 130 6922	
	20			09 25 120 6922	
without fixing flange	30			09 25 130 6572	
without fixing flange, SMC	30			09 25 130 6590	

Number of contacts

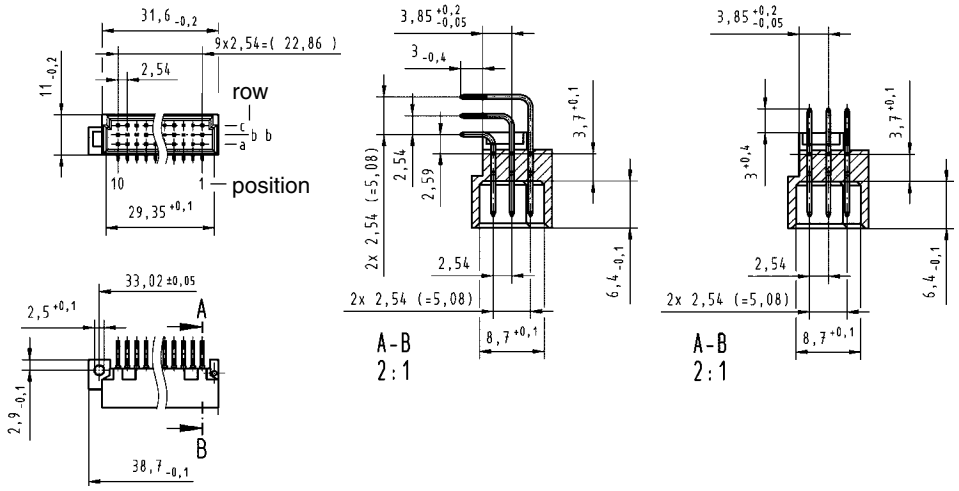
30, 20

Male connectors

Identification	Drawing	Dimensions in mm

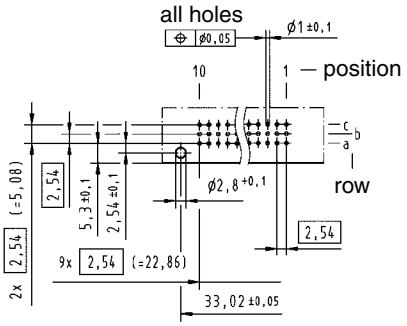
Dimensions

with fixing flange | without fixing flange | angled solder pins | straight solder pins

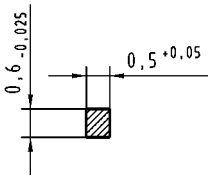


Board drillings

Mounting side



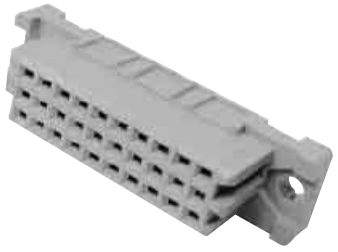
Cross section of solder terminations



Cross area (A) of contacts row a, b, c: A = 0.29 - 0.33 mm²

Number of contacts

30, 20

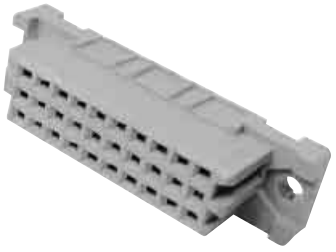


Female connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Female connector with solder pins 2.9 mm					
with fixing flange	30			09 25 230 6824	
	20			09 25 220 6824	
with fixing flange, SMC	30			09 25 230 6841	
without fixing flange, SMC	30			09 25 230 6414	
Female connector with solder pins 4.5 mm			Performance level 3 on request		Performance level 1 on request
with fixing flange	30			09 25 230 6825	
	20			09 25 220 6825	
Female connector with press-in pins 4.5 mm					
with fixing flange	30			09 25 230 6850	
without fixing flange	30			09 25 230 6870	

Number of contacts

30, 20

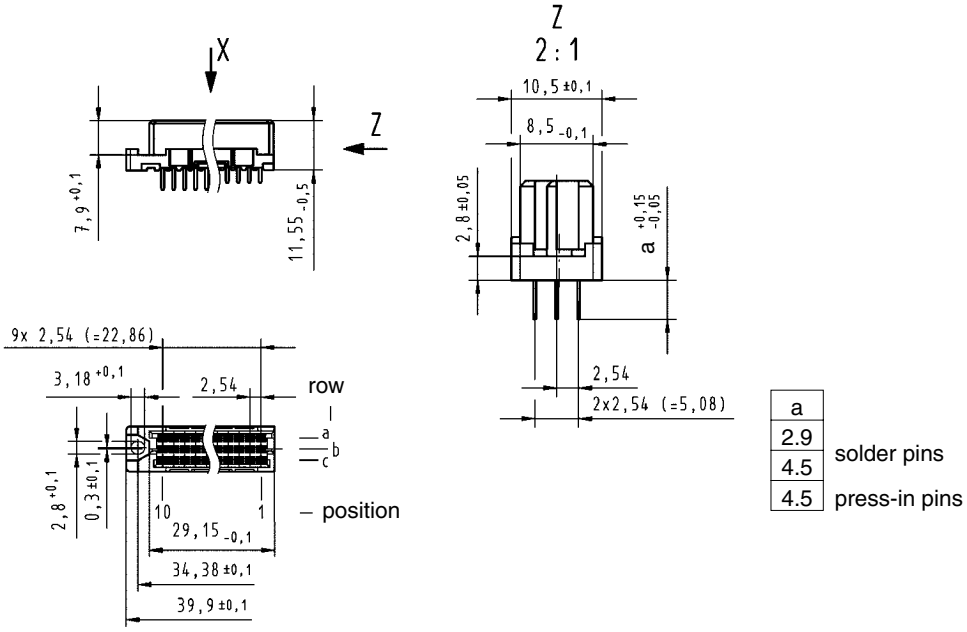


Female connectors

Identification	Drawing	Dimensions in mm

Dimensions

with fixing flange without fixing flange

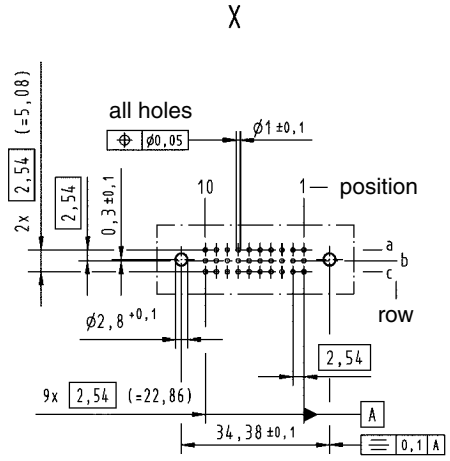


a	
2.9	solder pins
4.5	solder pins
4.5	press-in pins

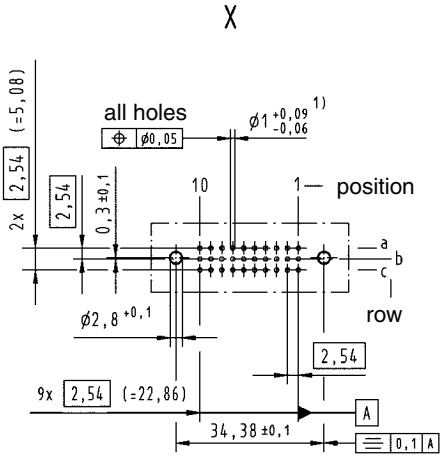
Board drillings

Mounting side

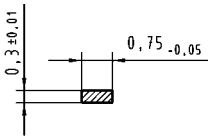
solder pins



press-in pins



Cross section of solder terminations



Cross area (A) of contacts row a, b, c: A = 0.20 - 0.23 mm²

1) for press-in connection acc. to IEC 60352-2

Number of contacts

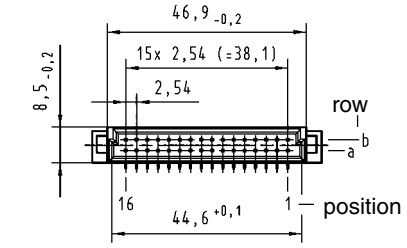
32

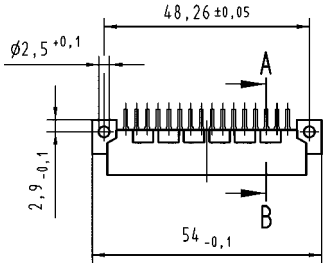
CTI > 400

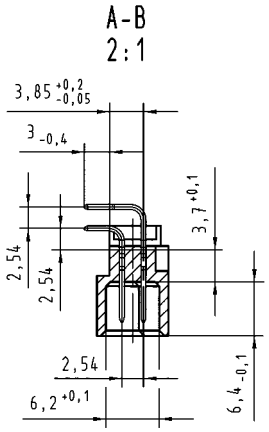
Male connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Male connector with angled solder pins					
without clip	32		Performance level 3 on request	09 22 132 6919	Performance level 1 on request
with clip	32			09 22 332 6919	
Male connector with straight solder pins	32			09 22 132 6920	

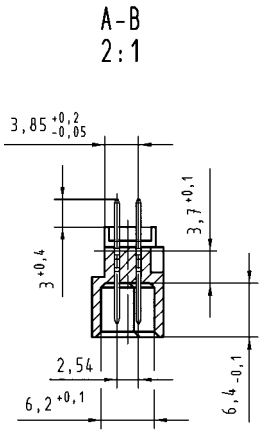
Dimensions







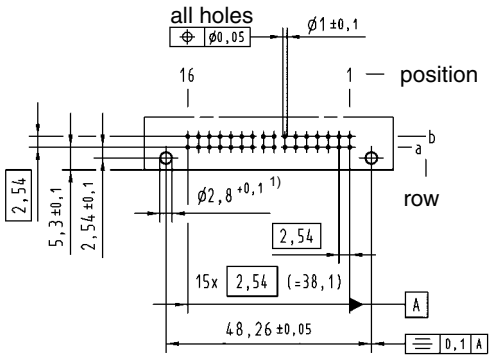
Angled solder pins



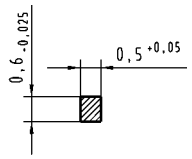
Straight solder pins

Board drillings

Mounting side



Cross section of solder terminations



Cross area (A) of contacts
row a, b: A = 0.29 - 0.33 mm²

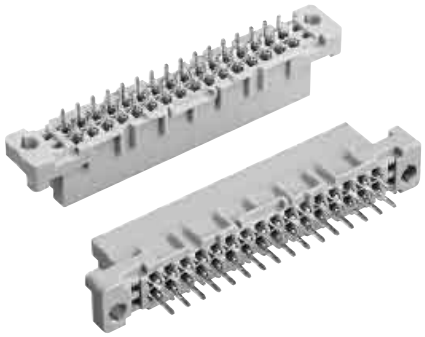
Dimensions in mm

1) Recommendation for variants with clip: Drillings can be enlarged up to 3.1 mm ø to reduce standard mounting force

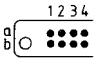
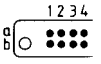
Number of contacts

32

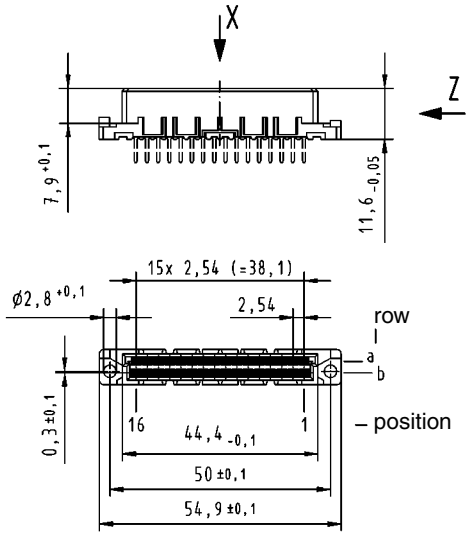
CTI > 400

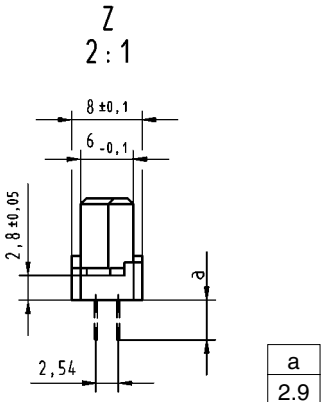


Female connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Female connector with solder pins 2.9 mm	32		Performance level 3 on request	09 22 232 6841	Performance level 1 on request
Female connector with solder pins 4.5 mm	32			09 22 232 6829	

Dimensions



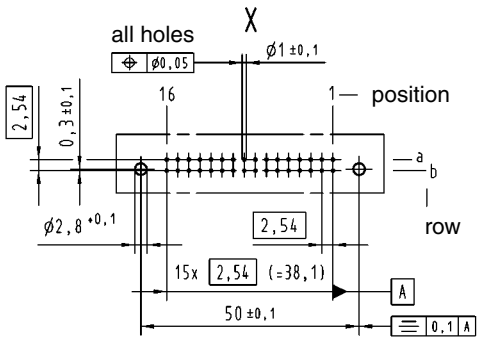


a
2.9
4.5

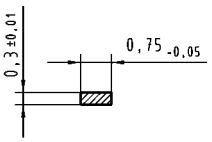
Solder pins

Board drillings

Mounting side



Cross section of solder terminations



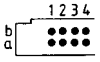
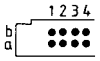
Cross area (A) of contacts
row a, b: A = 0.20 - 0.23 mm²

Number of contacts

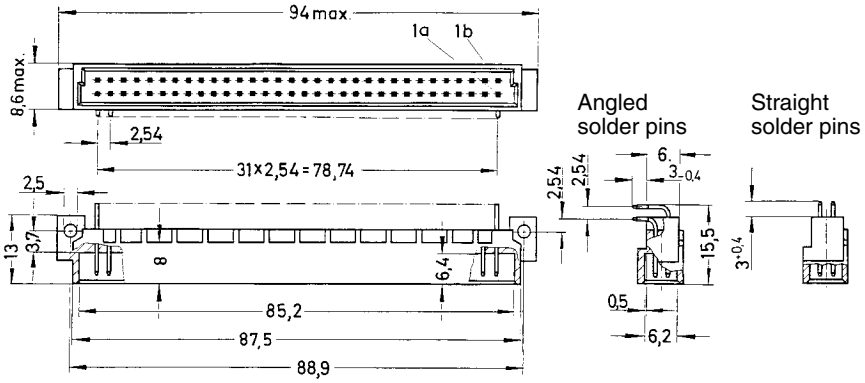
64

CTI > 400

Male connectors

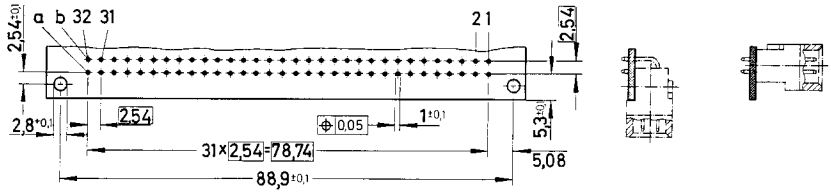
Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Male connector with angled solder pins	64		09 02 164 7919	09 02 164 6919	Performance level 1 on request
Male connector with straight solder pins	64		Performance level 3 on request	09 02 164 6920	

Dimensions

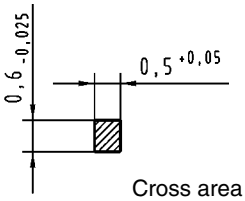


Board drillings

Mounting side



Cross section of solder terminations



Cross area (A) of contacts row a, b: A = 0.29 - 0.33 mm²

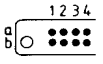
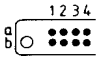
Dimensions in mm

Number of contacts

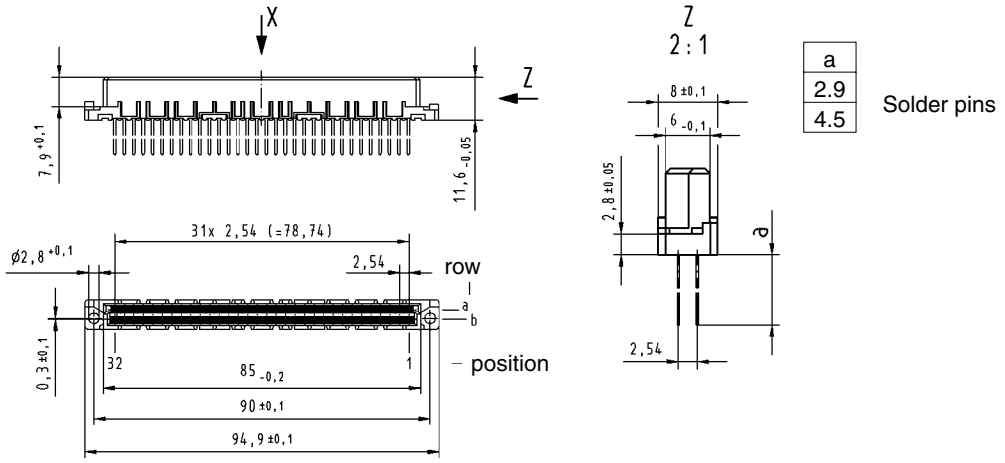
64

CTI > 400

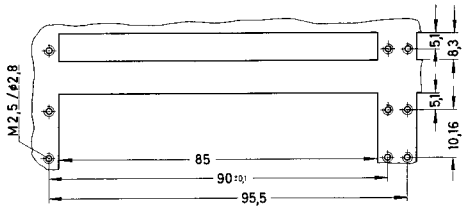
Female connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Female connector with solder pins 2.9 mm	64		Performance level 3 on request	09 02 264 6841	Performance level 1 on request
Female connector with solder pins 4.5 mm	64			09 02 264 6829	

Dimensions

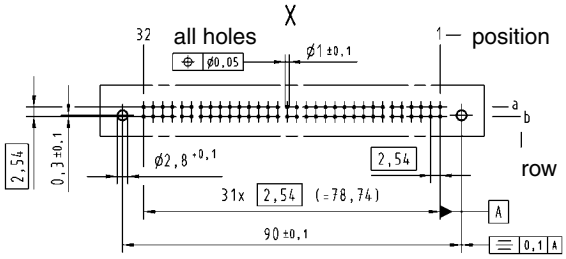


Panel cut out

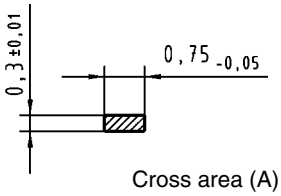


Board drillings

Mounting side



Cross section of solder terminations



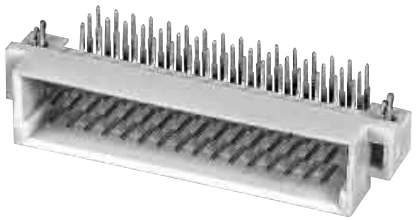
Cross area (A) of contacts row a, b: A = 0.20 - 0.23 mm²

Dimensions in mm

Number of contacts

48, 32

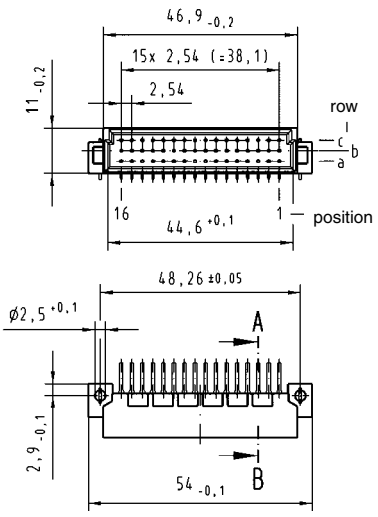
CTI > 400

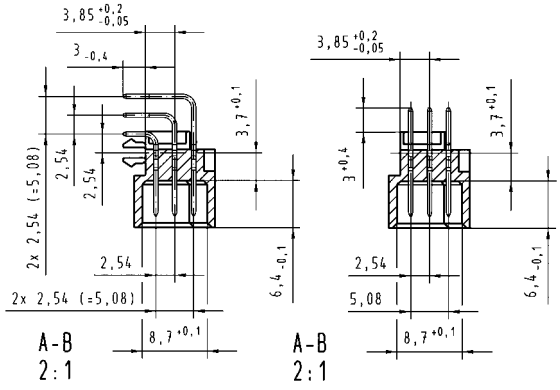


Male connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Male connector with angled solder pins	48		09 23 148 7919	09 23 148 6919	09 23 148 2919
without clip	32			09 23 132 6919	09 23 132 2919
with clip	48			09 23 348 6919	09 23 348 2919
	32			09 23 332 6919	09 23 332 2919
Male connector with straight solder pins	48			09 23 148 6920	
	32			09 23 132 6920	

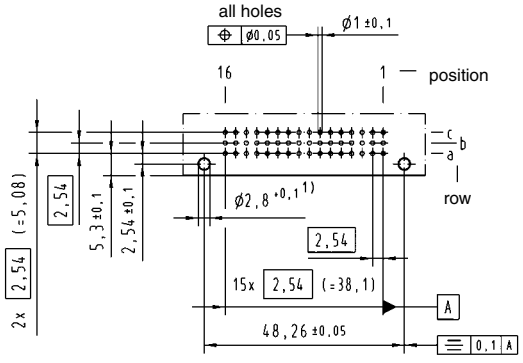
Dimensions



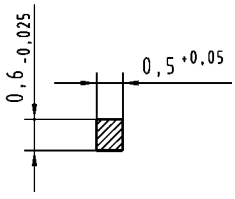


Board drillings

Mounting side



Cross section of solder terminations



Cross area (A) of contacts
row a, b, c: A = 0.29 - 0.33 mm²

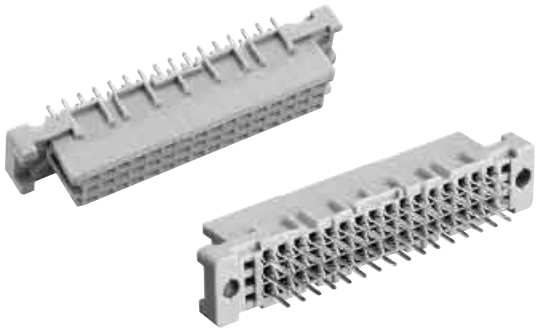
Dimensions in mm

[1] Recommendation for variants with clip: Drillings can be enlarged up to 3.1 mm ø to reduce standard mounting force

Number of contacts

48, 32

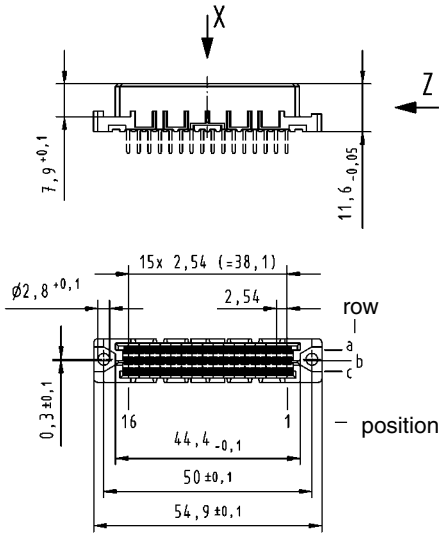
CTI > 400

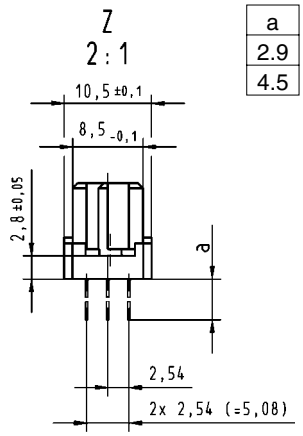


Female connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Female connector with solder pins 2.9 mm	48		Performance level 3 on request	09 23 248 6841	Performance level 1 on request
	32			09 23 232 6841	
Female connector with solder pins 4.5 mm	48			09 23 248 6829	
	32			09 23 232 6829	

Dimensions



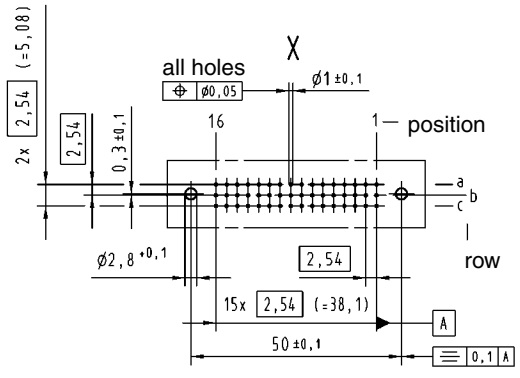


a
2.9
4.5

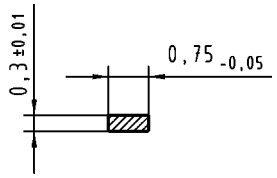
Solder pins

Board drillings

Mounting side



Cross section of solder terminations



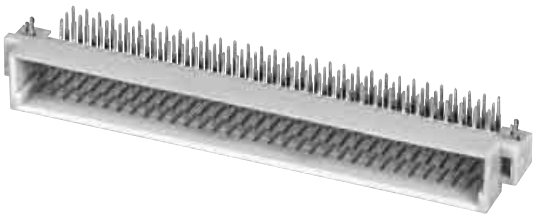
Cross area (A) of contacts
row a, b, c: A = 0.20 - 0.23 mm²

Dimensions in mm

Number of contacts

96, 64

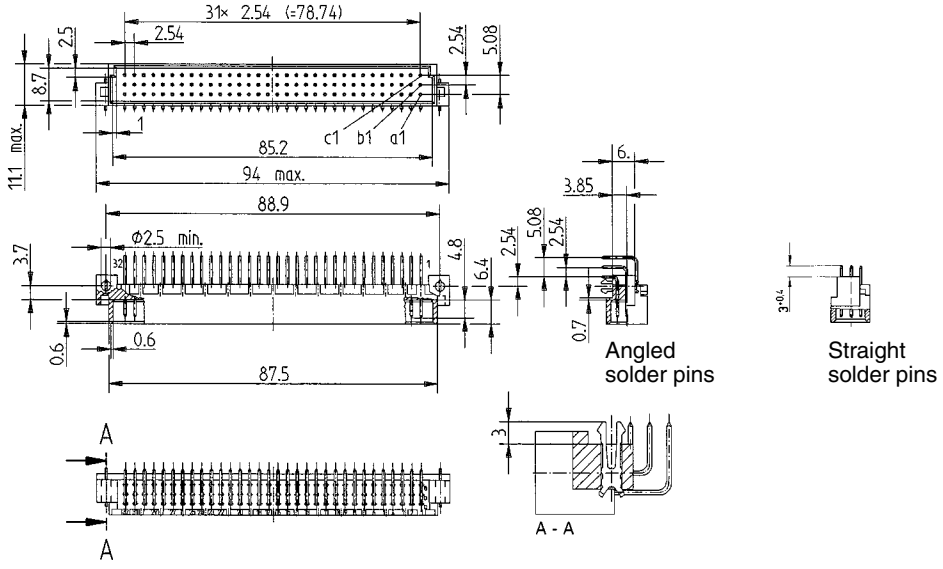
CTI > 400



Male connectors

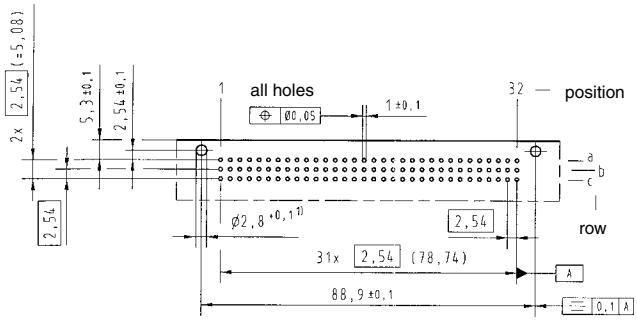
Identification	Number of contacts	Contact arrangement	Part No. Performance levels according to IEC 60 603-2. 2	1
Male connector with angled solder pins	96		09 03 196 6919 09 03 696 6919[c)]	09 03 196 2919
without clip	64		09 03 164 6919	09 03 164 2919
	62 + 2▲			09 03 164 2918
with clip	96		09 03 396 6919	09 03 396 2919
	94 + 2▲		09 03 396 6918	
	64		09 03 364 6919	09 03 364 2919
Male connector with straight solder pins	96		09 03 196 6920	

Dimensions

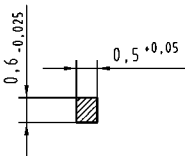


Board drillings

Mounting side



Cross section of solder terminations



Cross area (A) of contacts
row a, b, c: A = 0.29 - 0.33 mm²

Dimensions in mm

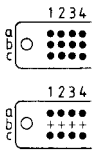
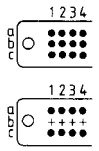
▲ Male connectors with 2 leading contacts [(0.8 mm) pos. a1 and a32]. Lagging pins row b on request.
1) Recommendation for variants with clip: Drillings can be enlarged up to 3.1 mm ø to reduce standard mounting force
c) Connectors with coding

Number of contacts

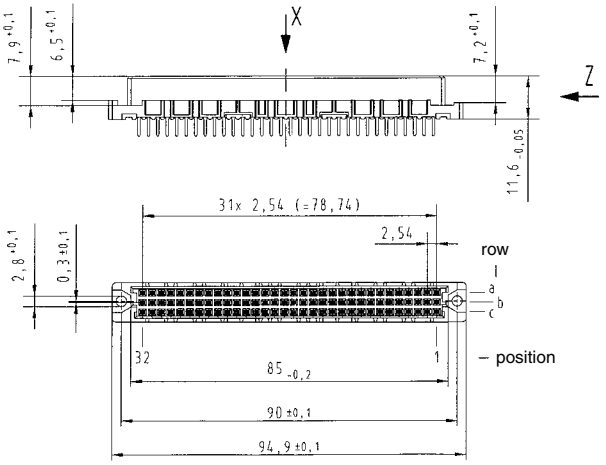
96, 64

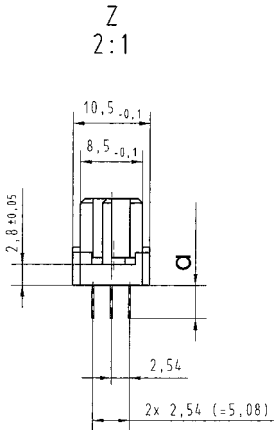
CTI > 400

Female connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Female connector with solder pins 2.9 mm	96 64		Performance level 3 on request	09 03 296 6841 09 03 264 6841	Performance level 1 on request
Female connector with solder pins 4.5 mm	96 64			09 03 296 6829 09 03 264 6829	

Dimensions



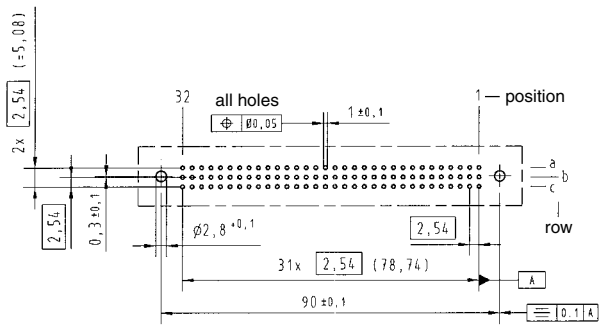


a
2.9
4.5

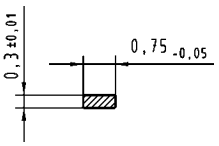
Solder pins

Board drillings

Mounting side



Cross section of solder terminations



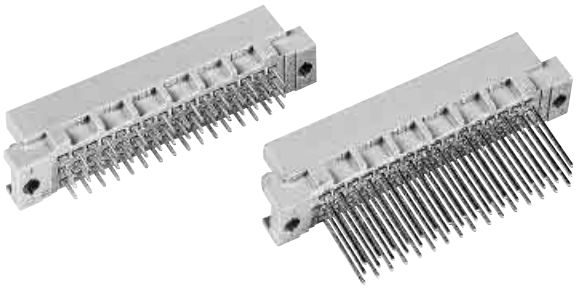
Cross area (A) of contacts
row a, b, c: A = 0.20 - 0.23 mm²

Dimensions in mm

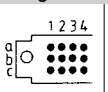
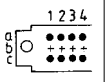
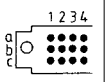
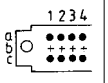
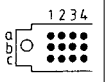
Number of contacts

48, 32

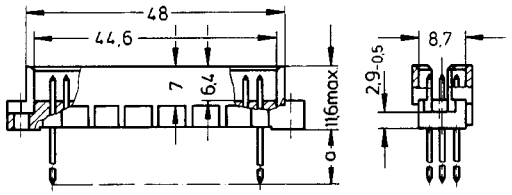
CTI > 400



Male connectors

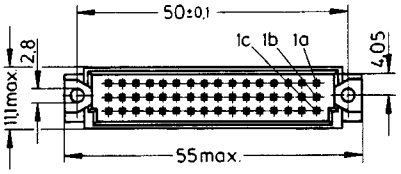
Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Male connector with straight solder pins 2.5 mm	48		Performance level 3 on request	09 28 148 6519	Performance level 1 on request
	32			09 28 132 6519	
Male connector with straight solder pins 4.0 mm	48			09 28 148 6520	
	32			09 28 132 6520	
Male connector with straight solder pins 13 mm	48			09 28 148 6521	

Dimensions



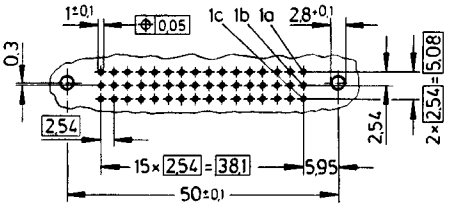
a
2.5
4
13

Solder pins

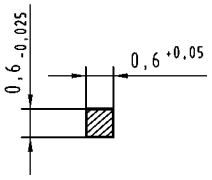


Board drillings

Mounting side



Cross section of solder terminations



Cross area (A) of contacts row a, b, c: A = 0.35 - 0.39 mm²

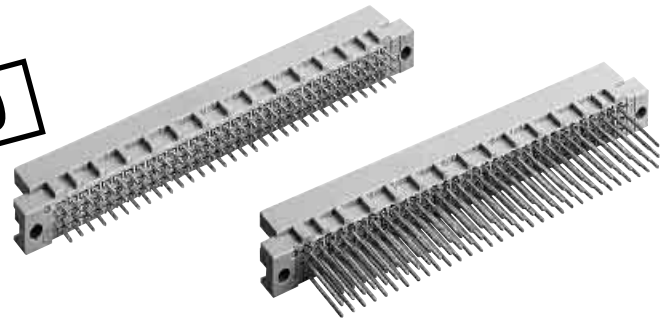
Dimensions in mm

Notes

Number of contacts

96

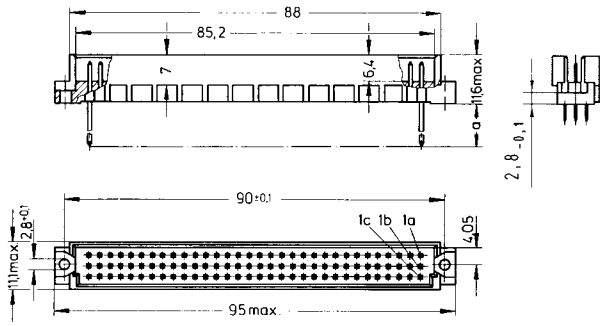
CTI > 400



Male connectors

Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1
Male connector with straight solder pins 2.5 mm	96		Performance level 3 on request	09 73 196 6519	Performance level 1 on request
Male connector with straight solder pins 4.0 mm	96			09 73 196 6520	
Male connector with straight solder pins 13 mm	96			09 73 196 6521	

Dimensions

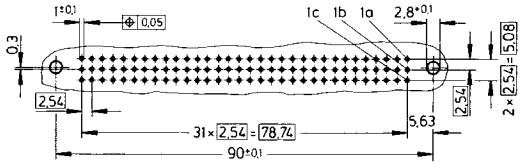


a
2.5
4
13

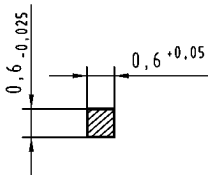
Solder pins

Board drillings

Mounting side



Cross section of solder terminations



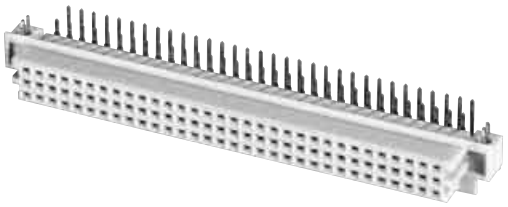
Cross area (A) of contacts row a, b, c: A = 0.35 - 0.39 mm²

Dimensions in mm

Number of contacts

96, 64

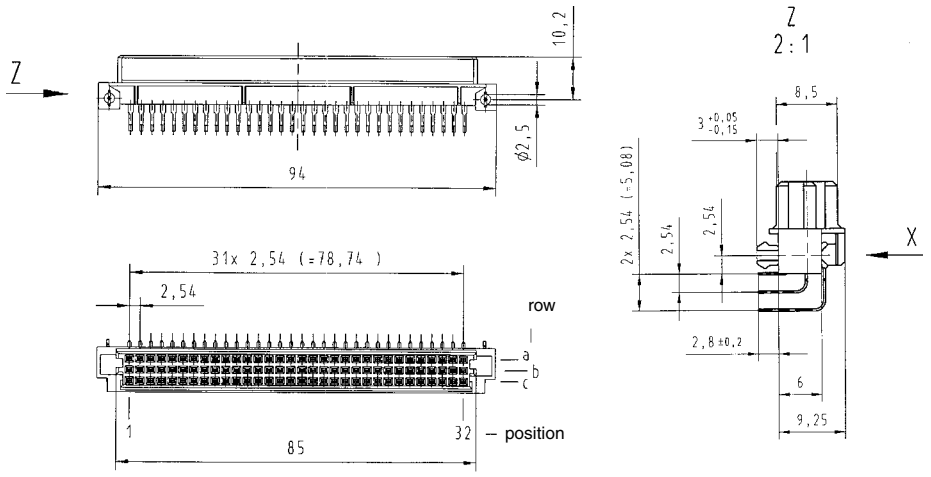
CTI > 400



Female connectors

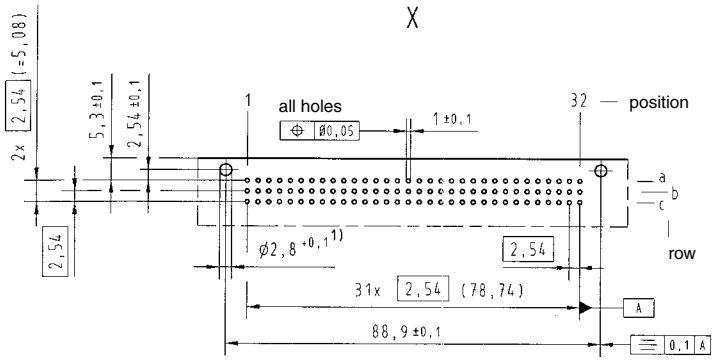
Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2. 2	1
Female connector with solder pins					
without clip	96			09 73 296 6804	
	64			09 73 264 6804	
with clip	96			09 73 496 6804	09 73 496 2804
	64			09 73 464 6804	09 73 464 2804

Dimensions

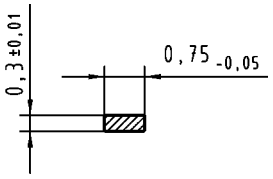


Board drillings

Mounting side



Cross section of solder terminations



Cross area (A) of contacts row a, b, c: A = 0.20 - 0.23 mm²

Dimensions in mm

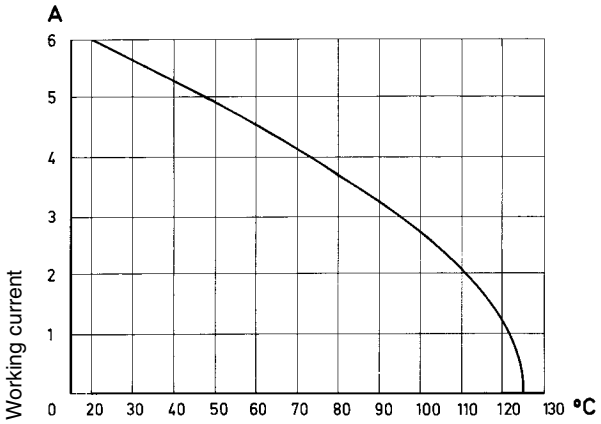
1) Recommendation for variants with clip: Drillings can be enlarged up to 3.1 mm ø to reduce standard mounting force

Number of contacts	32-48
Contact spacing (mm)	5.08
Working current see current carrying capacity chart	6 A max.
Clearance	≥ 1.6 mm
Creepage	≥ 3.0 mm
Working voltage The working voltage also depends on the clearance and creepage dimensions on the PCB itself and the associated wiring	according to the safety regulations of the equipment
Test voltage $U_{r.m.s.}$	1.55 kV (contact-contact) 2.5 kV (contact-ground)
Contact resistance	≤ 15 mΩ
Insulation resistance	≥ 10^{12} Ω
Temperature range	– 55 °C … + 125 °C
Electrical termination	
Male connector	Solder pins for PCB connections Ø 1 ± 0.1 mm according to IEC 60326-3 Wrap posts 1 x 1 mm Diagonal 1.34-1.45 mm Crimp terminal 0.09-1.5 mm²
Insertion and withdrawal force	≤ 75 N
Materials	
Mouldings	Special material with NFF 16-101 ≤ F2 ≤ I3 UL 94-V0
Contacts	Copper alloy
Contact surface	
Contact zone	Selectively plated according to performance level

Current carrying capacity

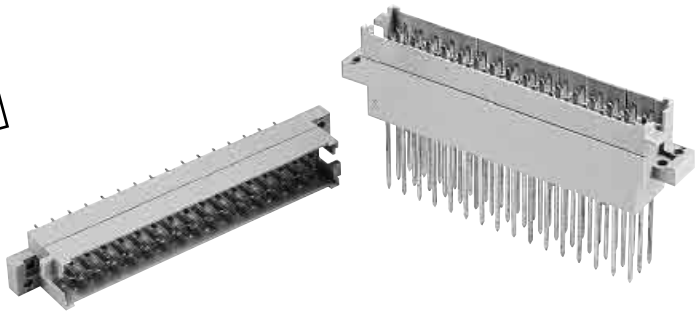
The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity curve is valid for continuous, non interrupted current loaded contacts of connectors when simultaneous power on all contacts is given, without exceeding the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

Control and test procedures according to DIN IEC 60512

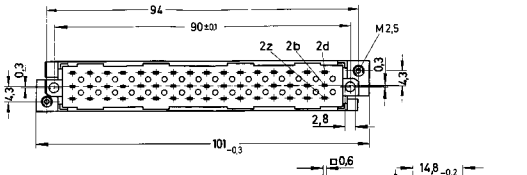
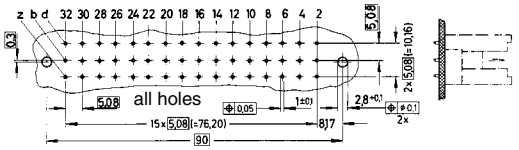
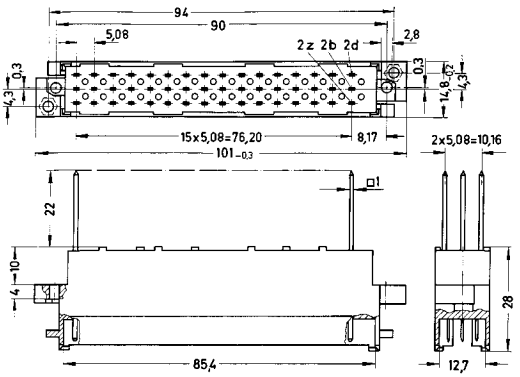
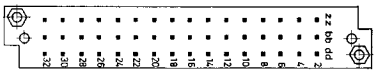
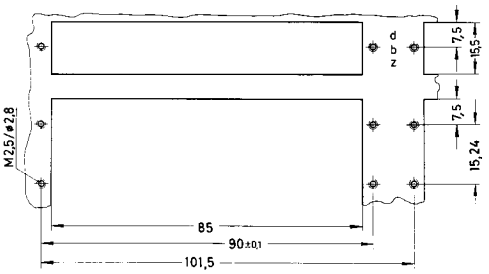


Notes

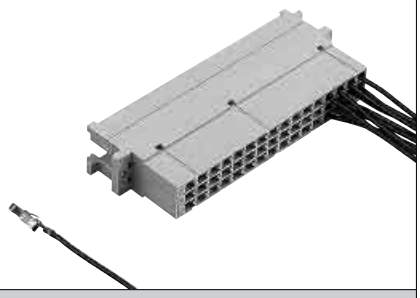
Railway classification NFF 16-101
Smoke index: F1
Flammability class: I2



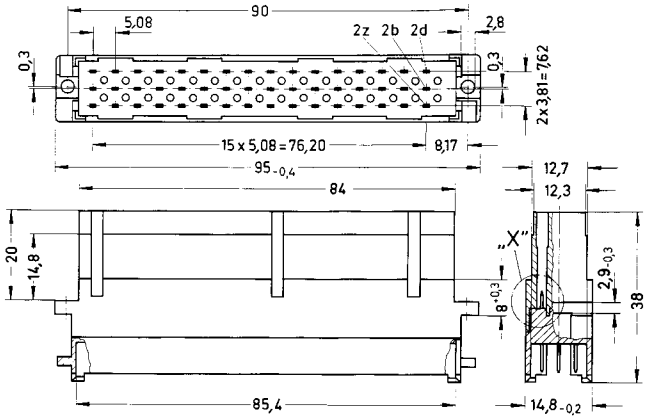
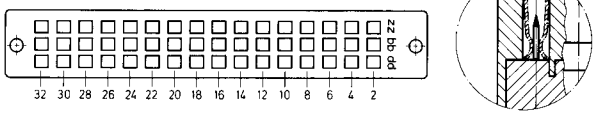
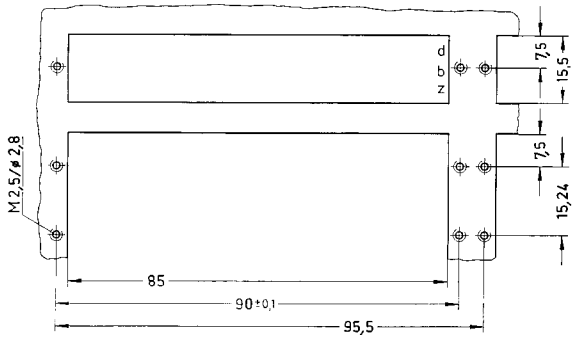
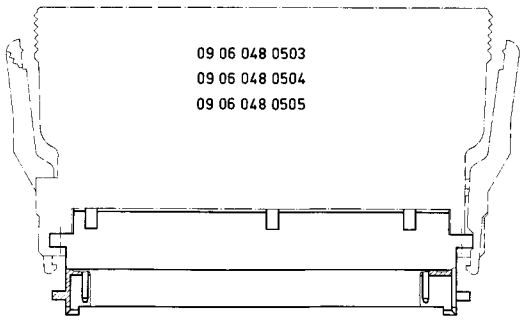
Interface connectors I

Identification	Number of contacts	Contact arrangement	Part No.	Drawing
Interface connector I with solder pins 0.6 x 0.6 mm			Performance level 1	
	48		09 06 048 2905	
	32		09 06 032 2905	
	32		09 06 032 2941	
				
Board drillings Mounting side				
Interface connector I with wrap posts 1 x 1 mm			Performance level 1	
without nut	48		09 06 048 2903	
with nut	48		09 06 048 2963	
without nut	32		09 06 032 2903	
with nut	32		09 06 032 2963	
				
				Contact arrangement View from termination side 
Panel cut out				

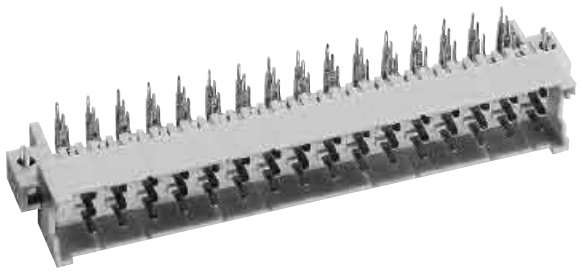
Railway classification NFF 16-101
Smoke index: F1
Flammability class: I2



Interface connector I

Identification	Number of contacts	Part No.	Drawing	Dimensions in mm
Interface connector I utilising female crimp contacts	48	Performance level 1 acc. to IEC 60 603-2 09 06 048 2906		
			Contact arrangement View from termination side 	
Panel cut out				
Mounted in shell housing B				

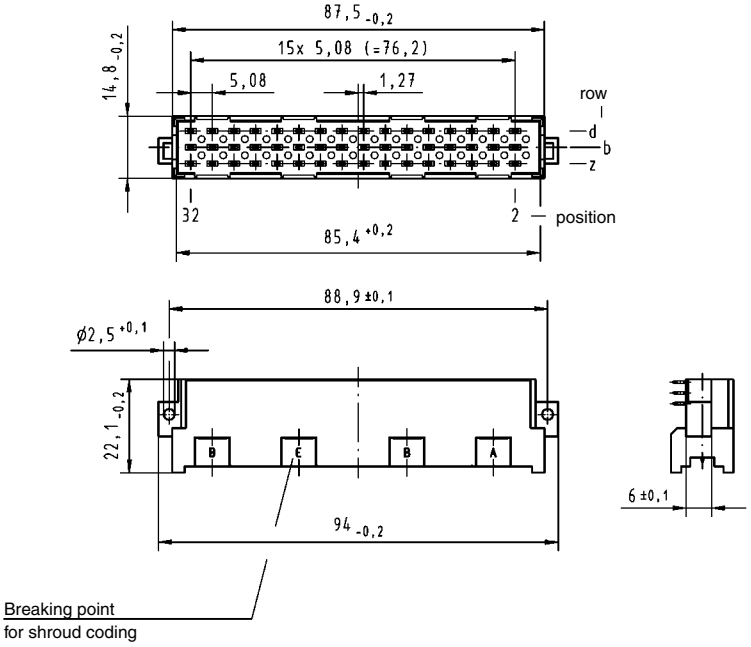
Railway classification
NFF 16-101
Smoke index: F2
Flammability class: I3



Male connectors, angled

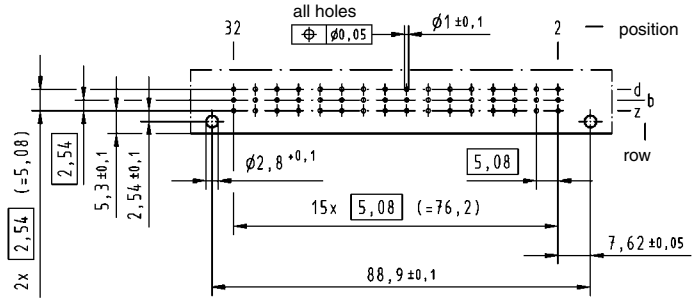
Identification	Number of contacts	Contact arrangement	Part No. Performance levels according to IEC 60 603-2. 2	1
Male connector without retention clip	48		09 06 148 6901 222	09 06 148 2901 222
with retention clip	48		09 06 348 6901 222	

Dimensions



Board drillings

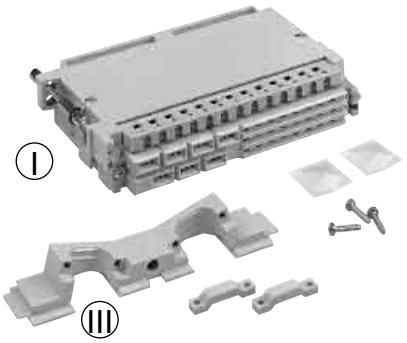
Mounting side

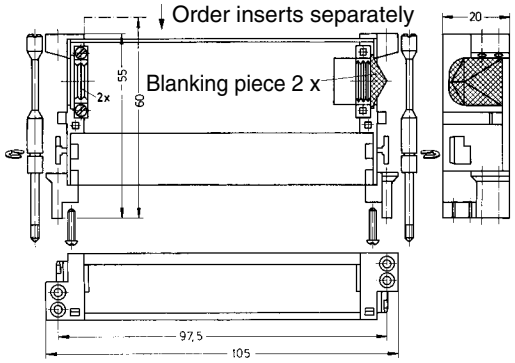
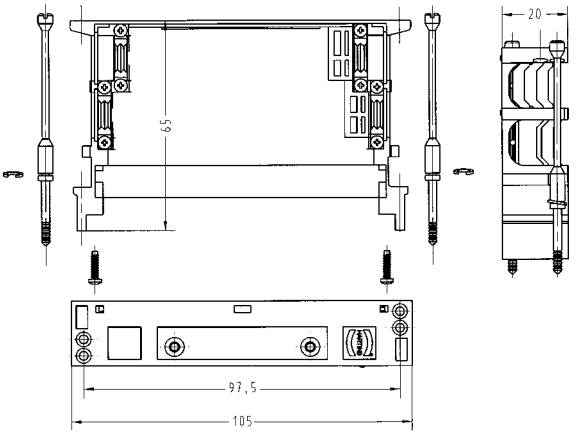
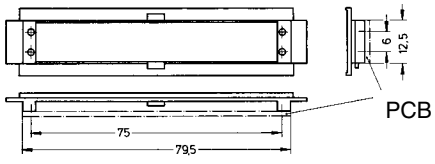
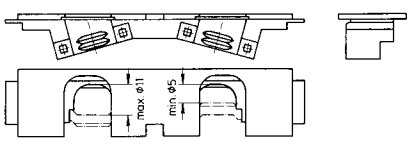


Dimensions in mm

Shell housing D 20 for types F, H and MH

Railway classification
NFF 16-101
Smoke index: F1
Flammability class: I2



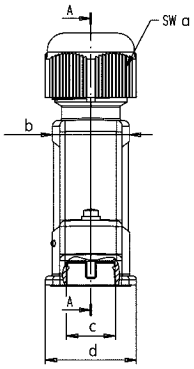
Identification	Part No.	Drawing	Dimensions in mm
Shell housing D 20/2 Two side cable entries Ⓘ Supplied with: Shell 1x Cover 1x Locking screw 2x Locking washer 2.3 2x Screw BZ 2.2x9.5 10x Blinding piece 2x Cable clamp 2x	20 mm 09 06 048 0521		
Shell housing D 20/4 Four side cable entries Ⓘⓘ Supplied with: Shell 1x Cover 1x Locking screw 2x Locking washer 2.3 2x Screw BZ 2.2x9.5 12x Blinding piece 3x Cable clamp 2x	20 mm 09 06 048 0522		
Inserts e. g. for LED* for 55 mm height	09 06 000 9986		
Round cable insert* 2 x ø 11 Ⓘⓘⓘ	09 06 000 9988		

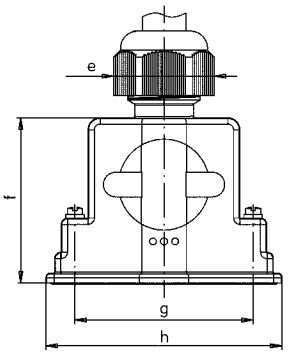
* Passend für D 20/2

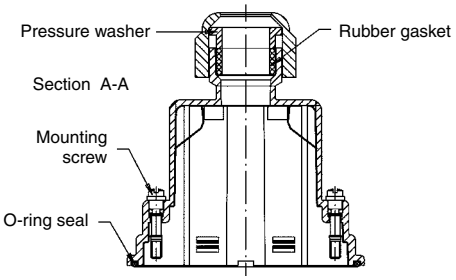
IP 67 plastic hoods
IP 67 metallized plastic hoods

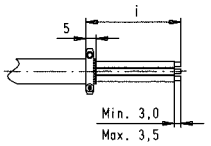
Identification	No. of contacts	Part No.
Hood		
Black thermoplastic		
	9	09 67 009 043 .
	15	09 67 015 043 .
	25	09 67 025 043 .
	37	09 67 037 043 .
	50	09 67 050 043 .
Metallized thermoplastic		
	9	09 67 009 053 .
	15	09 67 015 053 .
	25	09 67 025 053 .
	37	09 67 037 053 .
	50	09 67 050 053 .
Please insert digit for screw option		
Locking screw, thread 4-40 UNC ▶ 8		
Locking screw, thread M3 ▶ 9		

Drawing

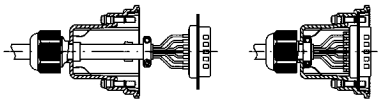








Stripping dimensions



Mounting instructions:

– The peeled back cable braiding must not extend over the cable clamp, in order not to damage the gasket or to impair its performance.
– Pull back cable until cable clamp snaps into shielding plate.
– Snap connector into hood.

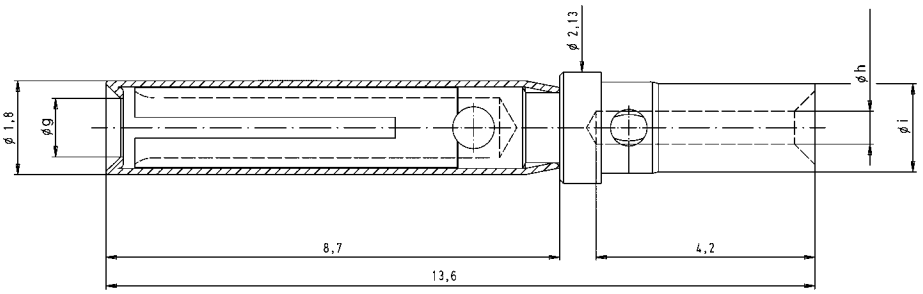
	a	b	c	d	e	f	g	h	i
9	20	16.5	13.0	20.2	22.1	36.4	25.0	39.8	23.0
15	24	16.5	13.0	20.2	26.6	36.4	33.3	48.5	23.0
25	24	20.3	13.0	24.0	26.6	43.6	47.0	62.3	50.0
37	24	20.3	13.0	24.0	26.6	52.1	63.5	78.6	65.0
50	29	22.0	16.0	27.6	32.1	52.1	61.1	75.7	65.0

Crimp contacts

Identification	Wire gauge (mm^2)	Part No.
		turned female contacts
		Performance level 1*
Individual contacts with round bushing	AWG 22-18 0.33-0.82	09 67 000 3672
	AWG 24-20 0.25-0.52	09 67 000 8672
	AWG 28-26 0.09-0.13	09 67 000 6672

Female contacts with round bushing

	g	h	i
AWG 22-18	1.09	1.35	1.75
AWG 24-20	1.10	1.12	1.69
AWG 28-26	1.12	0.66	1.69



* Performance level 1 as per CECC 75 301-802, 500 mating cycles, 10 days 4 mixed gas test – IEC 60 512

Micro Card Edge connector

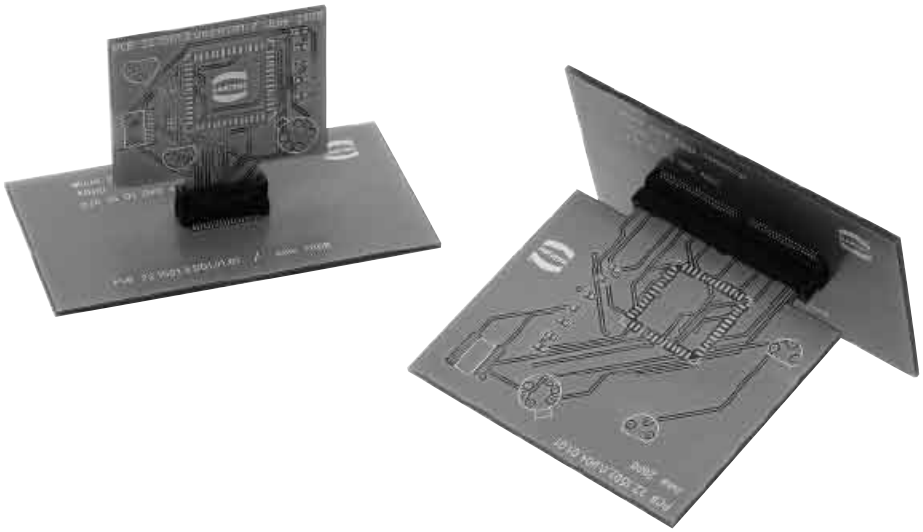
General information

HARTING offers the new Micro Card Edge connector in surface mount technology for PCBs with the thickness of 1.6 mm. The new connector is suitable for board-to-board mezzanine as well as for small „pluggable daughter card" applications. The key feature of the new connector in mezzanine applications is the achievement of flexible staple heights of parallel boards.

The HARTING Micro Card Edge connector allows data transfer rates up to 14Gbps and is suitable for high-speed applications in the telecom, medical and industrial markets. The connector is available with 40 or 100 contacts in 0.8 mm pitch.

An extremely smooth contact surface achieved by the usage of high performance stamping tools and a special surface finish ensures low insertion forces and a high contact reliability.

HARTING´s Micro Card Edge connector offers excellent features for high volume manufacturing like tape-and-reel packaging and a pad for nozzle in high volume productions.



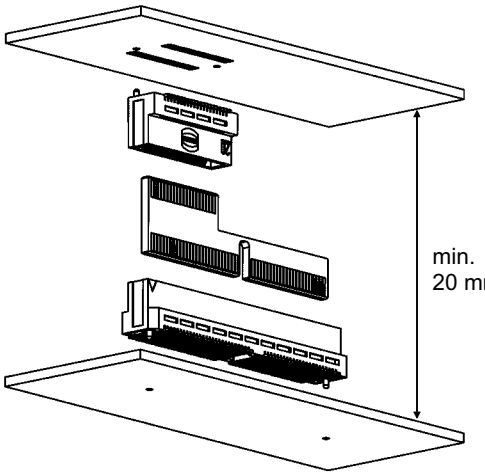
Features

- High speed data transmission between mezzanine or daughter card boards in telecom, medical, datacom and industrial applications.
- The key feature for mezzanine application is that the distance between parallel boards is flexible by utilizing a small board between the connectors. This gives flexibility in the mechanical design of the system.
- SMT termination to boards gives good signal integrity characteristics for the card edge connector.

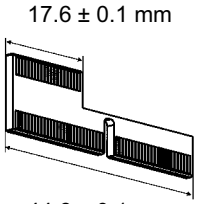
Technical characteristics

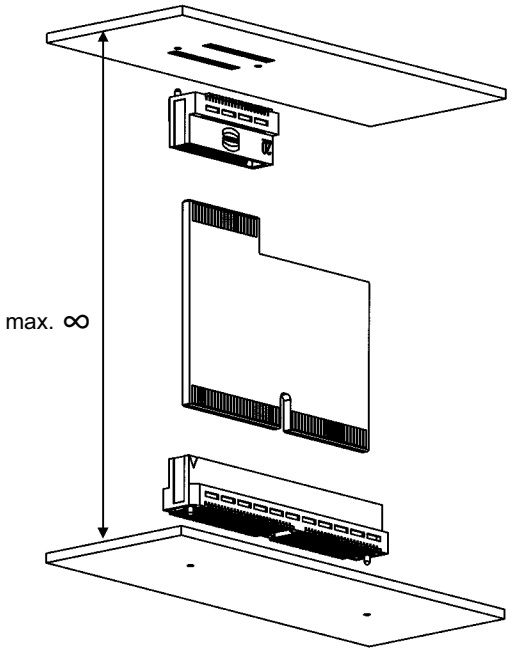
Rated current	1.7 A at 80 °C ambient
Rated voltage	400 V AC
Mating cycles	200
Insertion depth	4.22 mm – 5.66 mm
Number of contacts	40, 100
Card thickness	1.6 + 0.1 mm
Operating temperature	-55 °C up to +125 °C
Max processing temperature	230 °C for 60 sec. or 260 °C for 20 sec.
ROHS-compliance	yes
Materials	
Contacts	CuSn8 with Ni plating
Contact zone	Au/Ni plating
Termination zone	Sn/Ni plating

Board dimensions



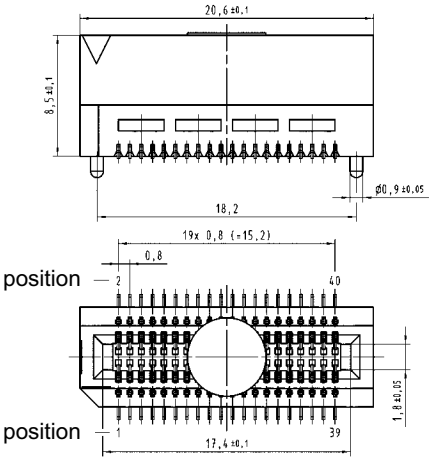
Card thickness
1.6 ± 0.1 mm

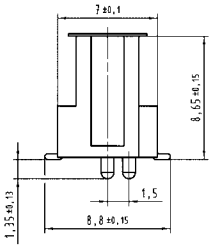


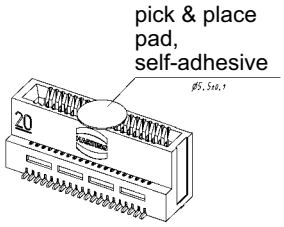


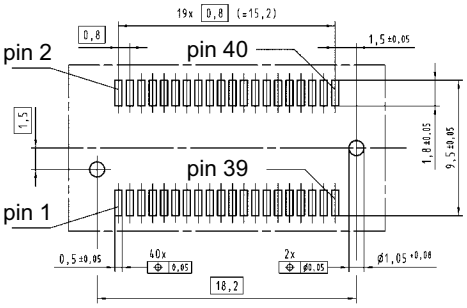
40pin connector

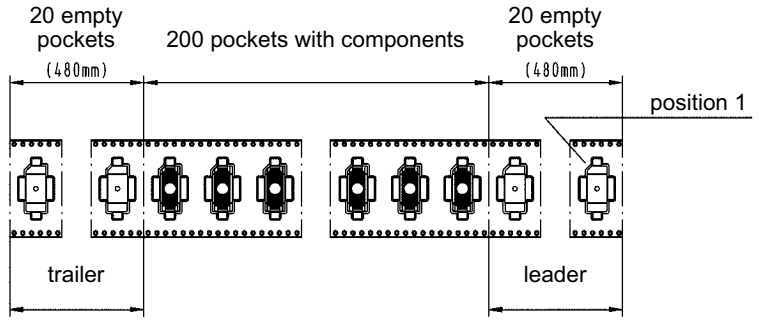
Identification	Number of contacts	Part No.	Drawing	Dimensions in mm
Micro Card Edge connector 200 pieces in a “Tape and Reel” packaging	40	15 01 040 4601 040		
Board layout				
“Tape and Reel” packaging				

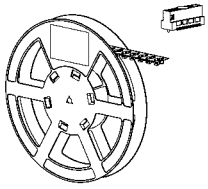








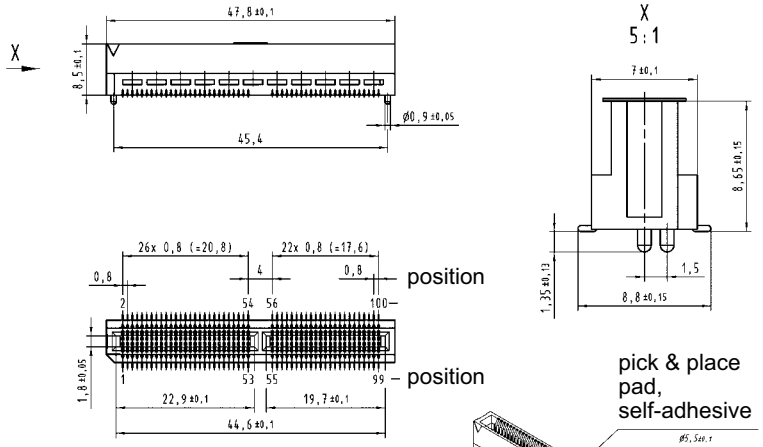




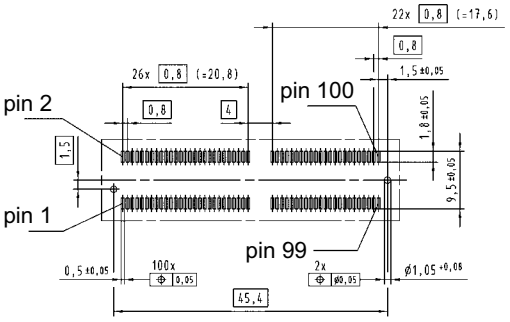
Micro Card Edge connector

100pin connector

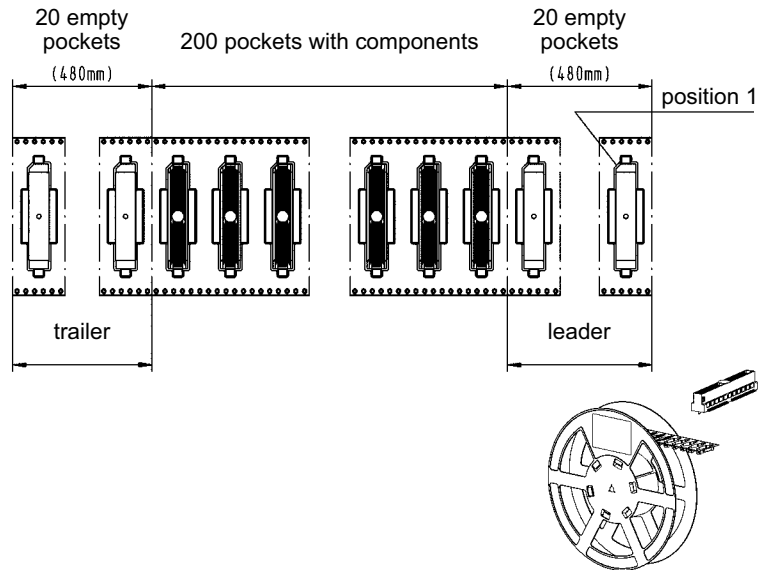
Identification	Number of contacts	Part No.	Drawing	Dimensions in mm
Micro Card Edge connector 200 pieces in a “Tape and Reel” packaging	100	15 02 100 4601 040		



Board layout



“Tape and Reel” packaging



Han® PushPull RJ45 Genderchanger metal

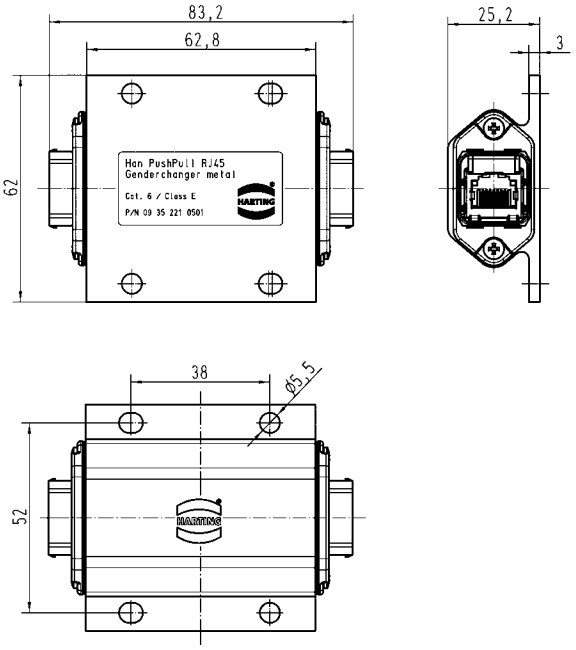
Han® PushPull RJ45 Genderchanger metal
Cat. 6 / Class E

Advantages

- High degree of protection IP 65 / IP 67
- Robust metal housing
- Standard PROFINET component of the German automotive production

Application

- Allows usage of different cable types (Type B, C) e.g. in robots application
- Extension of cords according to PROFINET guideline

Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull RJ45 Genderchanger metal including housing and printed board with 2 x RJ45 jack	09 35 221 0501		

Technical characteristics

Transmission performance	Cat. 6 / Class E up to 250 MHz
Connector	Han® PushPull RJ45 (PROFINET conform)
Locking	PushPull technology acc. to IEC/PAS 61076-3-117 Variant 14
Mating face	RJ45 acc. to IEC 60603-7
Mating cycles	min. 750
Housing material	Aluminium anodized
Dimensions	83.2 x 62 x 25.2 mm (unmated)
Degree of protection acc. to DIN 60529	IP 65 / IP 67 (mated)
Mounting	Wall mountable with 4 screws (type M5)
Temperature range	-20 °C ... +70 °C
Maximum permissible humidity	30 % ... 95 % (no condensation)

Han® PushPull L Power 4/0 Genderchanger metal

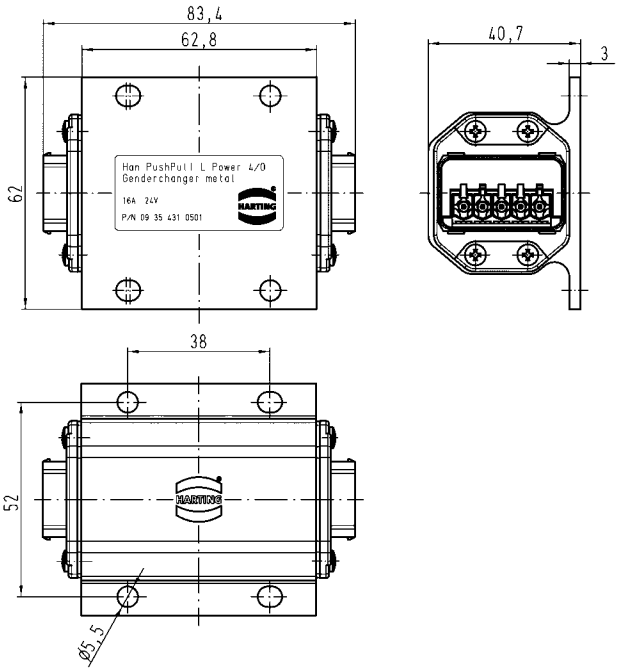
Han® PushPull L Power 4/0 Genderchanger metal

Advantages

- High degree of protection IP 65 / IP 67
- Robust metal housing
- Standard PROFINET component of the German automotive production

Application

- Allows usage of different cable types (Type B,C) e.g. in robots application
- Extension of cords according to PROFINET guideline

Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull L Power 4/0 Genderchanger metal including housing and printed board with 2 x male insert with solder termination	09 35 431 0501		

Technical characteristics

Connector	Han® PushPull L Power 4/0
Locking	PushPull technology acc. to IEC/PAS 61 076-3-117
Electrical transmission	16 A / 24 V
Number of contacts	5
Mating cycles	min. 500
Housing material	Aluminium anodized
Dimensions	83.4 x 62 x 40.7 mm (unmated)
Degree of protection acc. to DIN 60 529	IP 65 / IP 67 (mated)
Mounting	Wall mountable with 4 screws (type M5)
Temperature range	-20 °C … +50 °C
Maximum permissible humidity	30 % ... 95 % (no condensation)

Han® PushPull L Power 4/0 metal

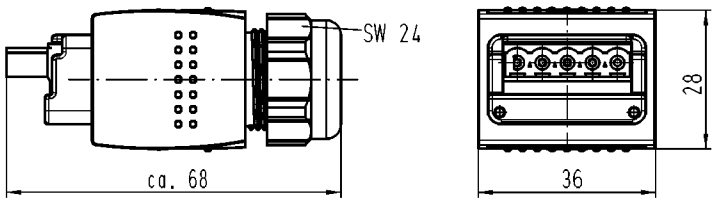
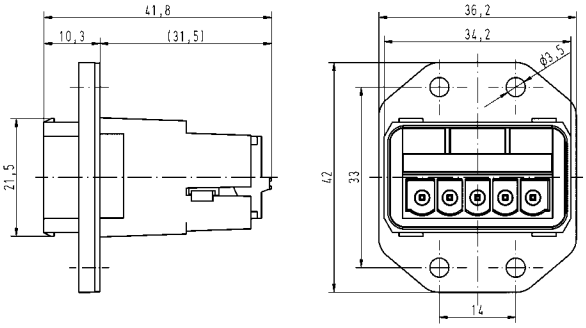
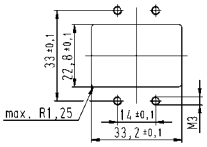
Connector, 5-poles, 24 V, 16 A

Features

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

Technical characteristics

Locking	PushPull technology acc. to IEC/PAS 61 076-3-117
Degree of protection	IP 65 / IP 67
Number of contacts	4 + PE
Electrical data	
acc. to DIN EN 61 984	16 A, 24 V, 4 kV 3
Termination	Spring force connection
Termination cross section	0.75 ... 2.5 mm²
Mating cycles	min. 500
Temperature range	-40 °C ... +70 °C
Cable diameter	9 – 13 mm
Housing material	Zinc die-cast, nickel plated

Identification	Part No.	Drawing	Dimensions in mm
Connector set, metal incl. housing and female insert with spring force connection	09 35 431 0401		
Panel feed-through, metal incl. housing and male insert with spring force connection	09 35 431 0311		
Protection cover IP 65 / IP 67 for device side	09 35 004 5401		
Panel cut out			

Han® PushPull L Power 4/0 plastic

Connector, 5-poles, 24 V, 16 A

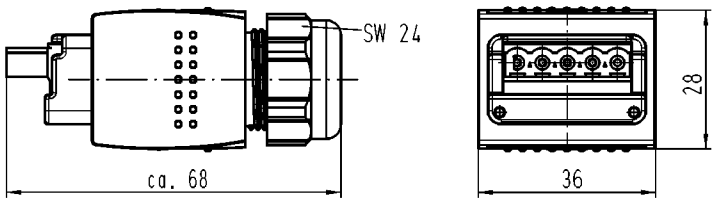
Features

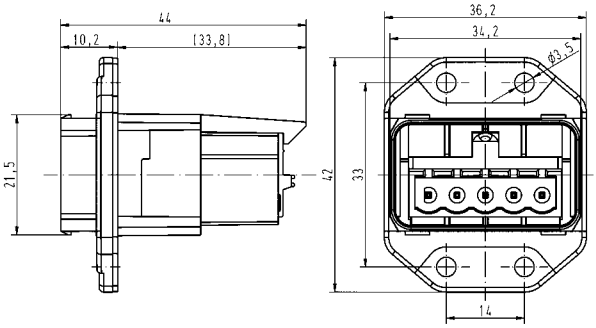
- HARTING PushPull technology
- Touch-proof
- Cable side: female insert
  - spring force connection
- Device side: male insert
  - spring force connection
- AIDA-conform
  (German Domestic Automobile Manufactures)

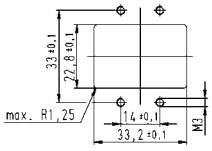
Technical characteristics

Locking	PushPull technology acc. to IEC/PAS 61076-3-117
Degree of protection	IP 65 / IP 67
Number of contacts	4 + PE
Electrical data	
acc. to DIN EN 61984	16 A, 24 V, 4 kV 3
Termination	Spring force connection
Termination cross section	0.75 ... 2.5 mm²
Mating cycles	min. 500
Temperature range	-40 °C ... +70 °C
Cable diameter	9 – 13 mm
Housing material	Plastic, black
Flammability acc. to	UL 94 V0

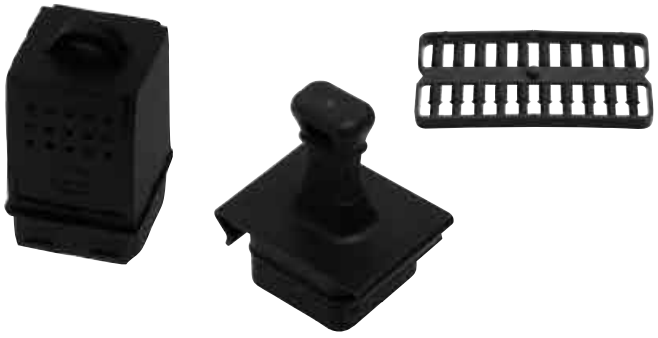
Identification	Part No.	Drawing	Dimensions in mm
Connector set, plastic incl. housing and female insert with spring force connection	09 35 431 0421		
Panel feed-through, plastic incl. housing and male insert with spring force connection	09 35 431 0331		
Protection cover IP 65 / IP 67 for device side	09 35 004 5401		
Panel cut out			



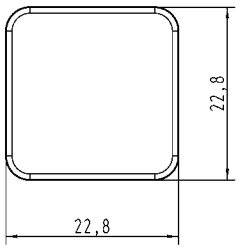
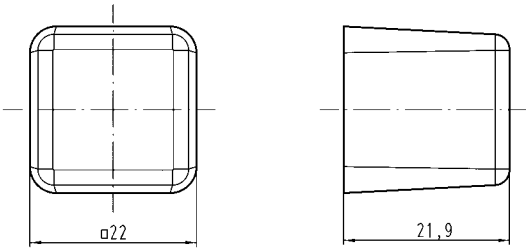
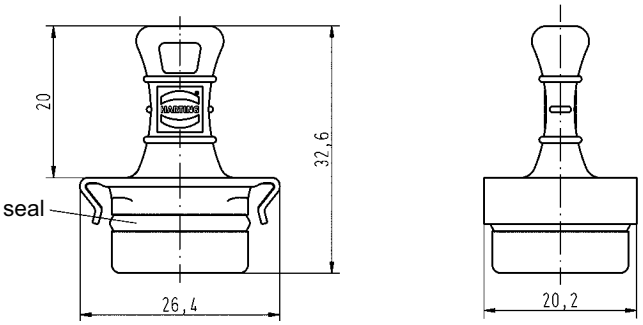
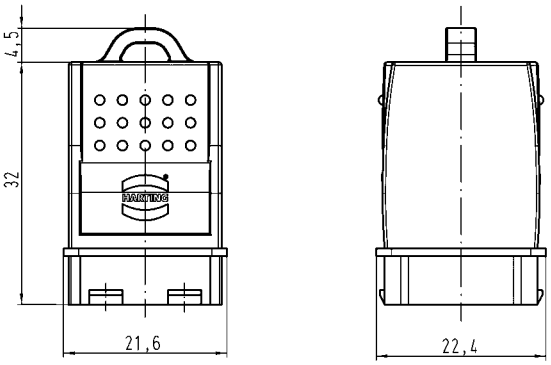
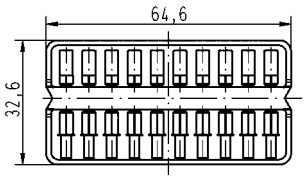




Han® PushPull Accessories



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

Identification	Part No.	Drawing	Dimensions in mm
Han® PushPull protection cover IP 40 for device side	09 35 002 5401		
Han® PushPull protection cover IP 40 for cable side	09 35 002 5412		
Han® PushPull protection cover IP 65 / IP 67 for device side	09 35 002 5402		
Han® PushPull protection cover IP 65 / IP 67 for cable side	09 35 002 5411		
Han® PushPull L for Power 4/0 protection cover IP 65 / IP 67 for device side	09 35 004 5401		
Han® PushPull coding pins for Power 4/0 for device and cable side	09 35 000 6190		

Notes

HARTING PushPull RJ45 metal

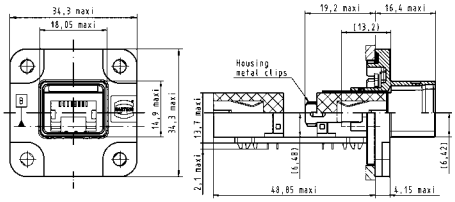
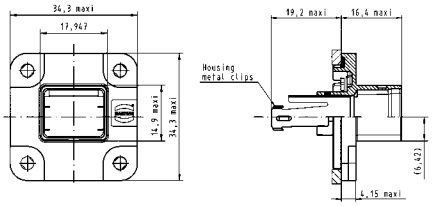
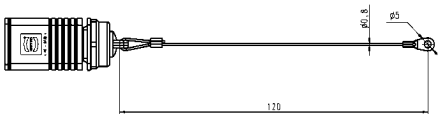
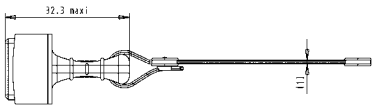
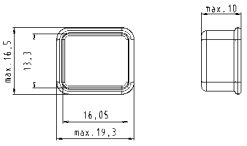
HARTING PushPull Technology acc. to IEC 61 076-3-106 variant 4
RJ45 panel feed-throughs and accessories

Advantages

- Small, space-saving PushPull interfaces in IP 65 / IP 67
- Easy handling of RJ45 patch cords in switch cabinets or sets
- Mounting to casings
- Category of transmission Cat. 5

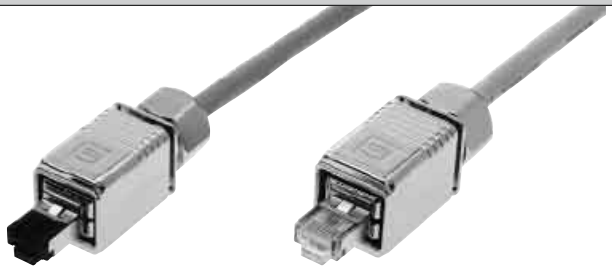
Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Transmission rate	10/100/1000 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mating cycles	min. 750
Degree of protection	IP 65 / IP 67
Temperature range	– 40 °C up to + 70 °C
Housing material	Zinc die cast
	UL approval

Identification	Part No.	Drawing (Dimensions in mm)
Panel feed-through set incl. housing bulkhead mounting EasyInstall with integrated seal, 2 x RJ45-jacks mounting on PCB board drillings for M3	09 45 295 1130	
Housing bulkhead mounting EasyInstall with fixing clip	09 45 595 0031	
Protection cover for housing bulkhead mounting with cord IP 65 / IP 67 fixing ring for M2.5 Version with active locking	for screw M2.5 09 45 845 0004 for screw M3 09 45 845 0006	
Version with passive locking	09 45 845 0009	
IP 40 transport protection for housing bulkhead mounting, rubber	09 45 845 0003	

Panel cut outs see page 126

HARTING PushPull RJ45 metal



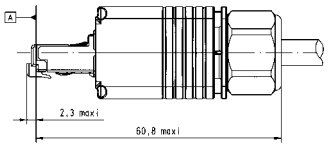
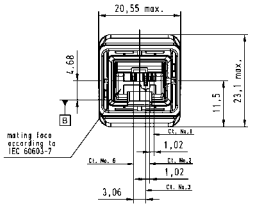
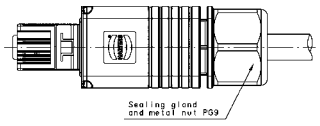
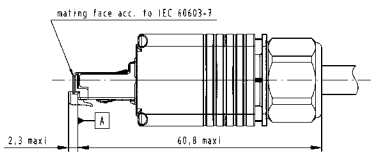
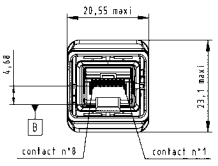
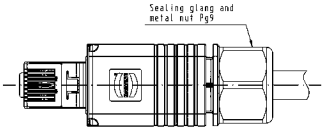
HARTING PushPull Technology acc. to IEC 61 076-3-106 variant 4
RJ45 connector

Advantages

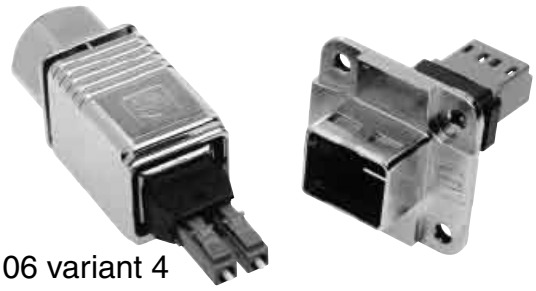
- Ethernet connector based on RJ45
- Fully shielded, 360° shielding contact
- Field-assembly connector
  with IDC contacts (Cat. 5 versions)
  or piercing contacts (Cat.6 versions)

Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP 65 / IP 67
Mating face	RJ45 acc. to IEC 60 603-7
Cable diameter	4.9 ... 8.6 mm
Termination cross section	
Cat. 5	AWG 24/7 ... AWG 22/7 (stranded) AWG 23/1 ... AWG 22/1 (solid)
Cat. 6	AWG 24/7 ... AWG 27/7 (stranded)
Mating cycles	min. 750
Temperature range	-40 °C up to +70 °C
Housing material	Zinc die cast
	UL approval

Identification	Part No.	Drawing	Dimensions in mm
Connector, 4-poles Cat. 5 incl. housing with RJ45 connector, shielding and cable gland	09 45 195 1100	 	
Connector, 8-poles Cat. 6 incl. housing with RJ45 connector, shielding and cable gland			
Wire manager white	09 45 195 1500	 	
Wire manager blue	09 45 195 1510		
Reference note: for cat. 6 patch cords it is recommended to use 1 connector with a white wire manager and one with a blue cable manager, in order to optimise the crosstalk between different signal pairs.			

HARTING PushPull LC duplex metal



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

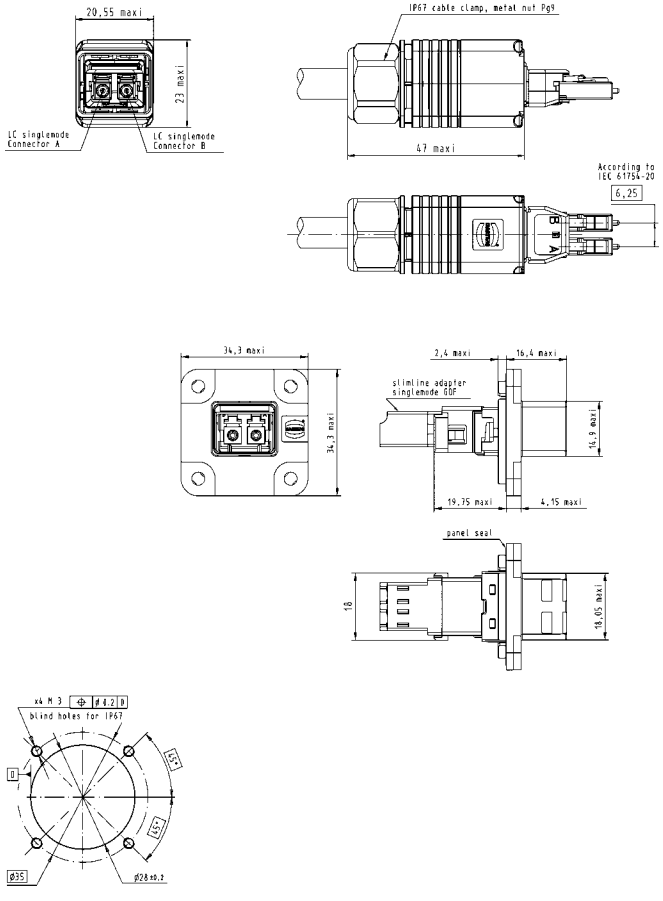
Advantages

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

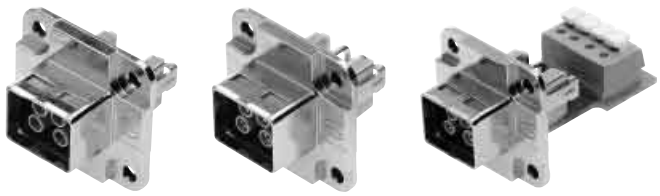
Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP 65 / IP 67
Mating face	LC acc. to IEC 61 754-20
Cable diameter	4.9 ... 8.6 mm
Mating cycles	min. 200
Temperature range	-40 °C up to +70 °C
Housing material	Zinc die cast

Identification	Part No.	Drawing	Dimensions in mm
HARTING PushPull LC duplex			
Cable side			
Multimode GOF	09 57 409 0500 000		
Singlemode GOF	09 57 409 0501 000		
Device side EasyInstall			
Multimode GOF	09 57 468 0500 000		
Singlemode GOF	09 57 468 0501 000		
Panel cut out			



HARTING PushPull Power metal



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

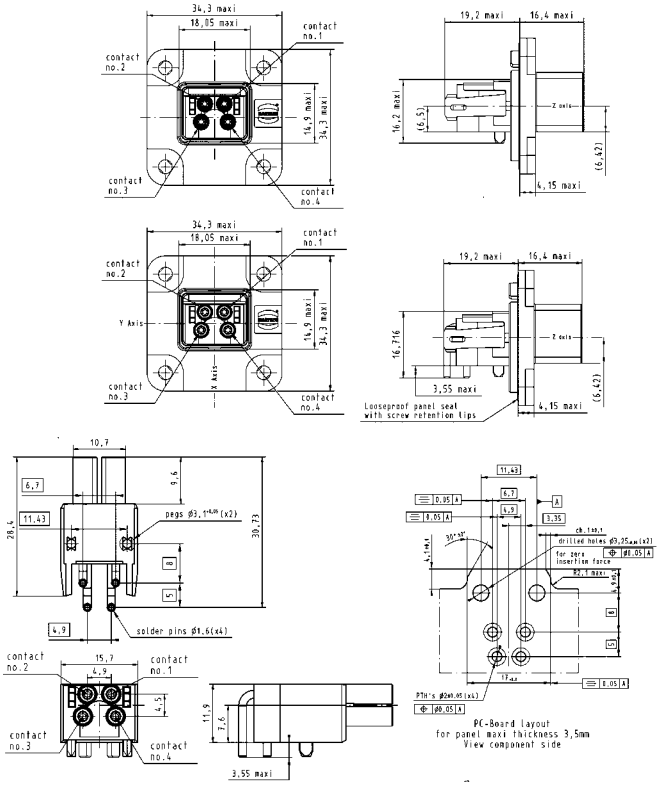
Advantages

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

Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP 65 / IP 67
Number of contacts	4
Electrical data acc. to EN 61 984	12 A, 48 V, 1.5 kV 3
Termination	Crimp
Termination cross section	0.75 - 2.5 mm² (AWG 20 - 12) stranded
Termination	Solder pins
Termination diameter	1.6 mm
Termination	Cable cage
Termination cross section	0.75 - 2.5 mm² (AWG 20 - 12) stranded
Mating cycles	min. 750
Temperature range	-40 °C up to +70 °C
Housing material	Zinc die cast

Identification	Part No.	Drawing	Dimensions in mm
Panel feed-through set			
Housing bulkhead mounting **EasyInstall** with 4 turned female contacts and insulation			
with crimp termination for 1.5 mm²	09 46 295 4430		
with solder termination, 90° angled	09 46 295 4030		
with cage clamp terminal on PCB	09 46 295 4031		
Power-female with solder termination 4-poles, 48V/12A, 90° angled	09 46 500 4400		
Accessories – crimp contacts female			
0.75 mm² (AWG 20 - 18)	09 46 500 0404		
1.5 mm² (AWG 16 - 14)	09 46 500 0402		
2.5 mm² (AWG 12)	09 46 500 0406		



Panel cut outs see page 126

HARTING PushPull Power metal

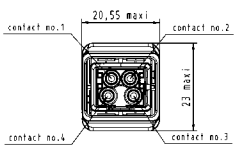
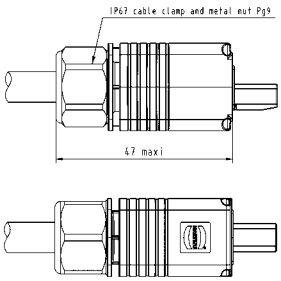
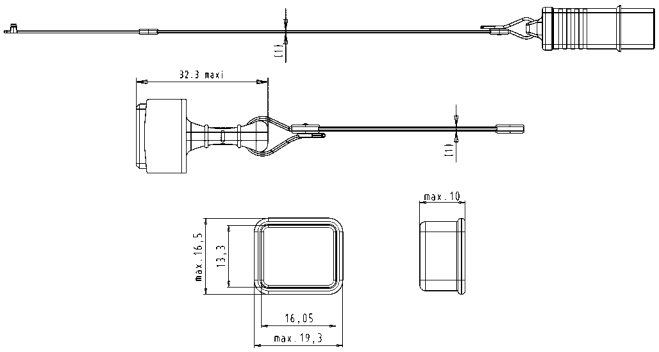
HARTING PushPull Power 4/0, type acc. to IEC 61 076-3-106 variant 4
connector 4-poles 48 V / 12 A

Advantages

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

Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP 65 / IP 67
Number of contacts	4
Electrical data acc. to EN 61 984	12 A, 48 V, 1.5 kV 3
Cable diameter	4.9 ... 8.6 mm
Termination	Crimp
Termination cross section	0.75 - 2.5 mm² (AWG 20 - 12) stranded
Mating cycles	min. 750
Temperature range	-40 °C up to +70 °C
Housing material	Zinc die cast

Identification	Part No.	Drawing	Dimensions in mm
Connector set incl. 4 turned crimp contacts (male), insulation, housing, cable gland	09 46 195 4400		
Accessories – crimp contacts male			
0.75 mm² (AWG 20 - 18)	09 46 500 0403		
1.5 mm² (AWG 16 - 14)	09 46 500 0401		
2.5 mm² (AWG 12)	09 46 500 0405		
Accessories – coding pin set To avoid accidental incorrect mating a coding system is required. This coding pins are inserted without loss of contact.	09 46 840 0000		
Accessories – protection cover IP 65 / IP 67			
for connector with cord	09 45 845 0010		
for device side with cord	09 45 845 0009		
Accessories – transport protection IP40			
for housing bulkhead mounting, rubber	09 45 845 0003		

Notes

Han® M12-L Crimp, 5 pins

Features

- Short and robust construction
- Compact design
- Easy and quick assembly
- Vibration resistant
- Use of standard D-Sub contacts is possible

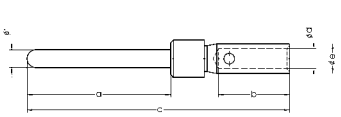
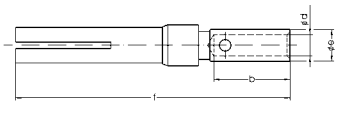
Technical characteristics

Number of contacts	5
Rated current	4 A
Rated voltage	32 V
Termination	Crimp termination
Wire gauge	AWG 22 - 20 0.34 - 0.5 mm²
Diameter of individual strands	1.5 - 2.3 mm
Wire diameter	5.0 - 8.5 mm
Flammability acc. to UL 94	V 0

Accessories

	Part-Number	Depiction
Crimping tool	09 99 000 0501	
Locator	61 03 600 0023	

Contacts

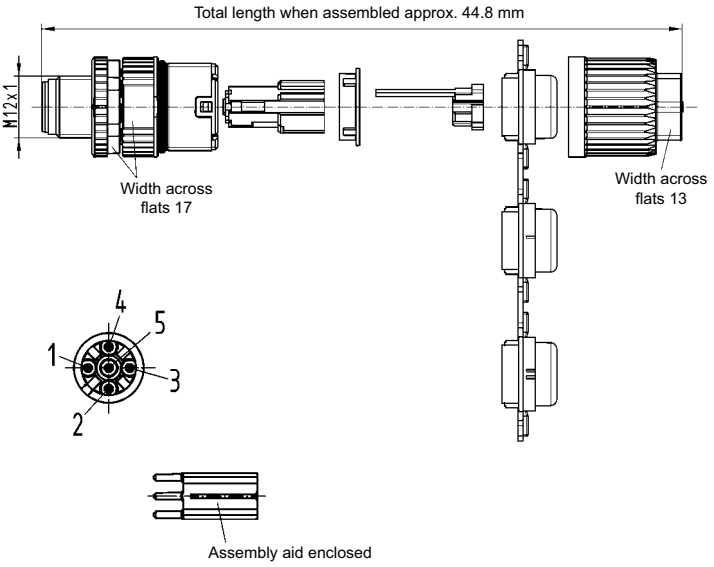
	Part-Number	Drawing	Dimensions in mm
Crimp contacts			
Turned male contacts			
AWG 22 - 20 / 0.33 - 0.52 AWG 26 - 22 / 0.13 - 0.35	61 03 000 0073 61 03 000 0094		
Turned female contacts			
AWG 22 - 20 / 0.33 - 0.52 AWG 26 - 22 / 0.13 - 0.35	61 03 000 0074 61 03 000 0096		

	a	b	c	d	e	f
AWG 22 - 20	8.10	4.0	14.8	1.12	1.66	14.4
AWG 26 - 22	8.10	4.0	14.8	0.90	1.66	14.4

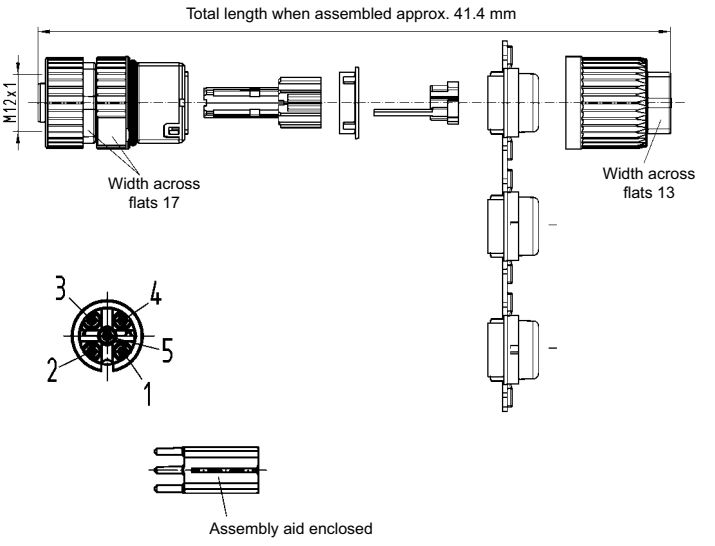
Han® M12-L Crimp, 5 pins

M12 Connector for Field Assembly

Idenification	Part-Number	Drawing	Dimensions in mm
Han® M12 Crimp			
Male, A-coding	21 03 812 1505		



Female, A-coding	21 03 812 2505	



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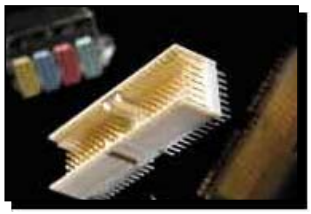
☐ 

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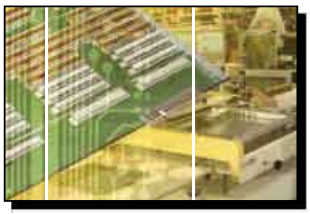
Device Connectivity

☐ 

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