

98 42 914 0201



Pushing Performance

HARTING News 2010



People | Power | Partnership

Transforming customer wishes into concrete solutions



The HARTING Technology Group is skilled in the fields of electrical, electronic and optical connection, transmission and networking, as well as in manufacturing, mechatronics and software creation.

The Group uses these skills to develop customized solutions and products such as connectors for energy and data transmission applications including, for example, mechanical engineering, rail technology, wind energy plants, factory automation and the telecommunications sector. In addition, HARTING also produces electromagnetic components for the automobile industry and offers solutions in the field of Enclosures and Shop Systems.

The HARTING Group currently comprises 32 subsidiary companies and worldwide distributors employing a total of approximately 3,000 staff.



HARTING Subsidiary company



HARTING Representatives



WE ASPIRE TO TOP PERFORMANCE.

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

ALWAYS AT HAND, WHEREVER OUR CUSTOMERS MAY BE.

Increasing industrialization is creating growing markets characterized by widely diverging demands and requirements. The search for perfection, increasingly efficient processes and reliable technologies is a common factor in all sectors across the globe. HARTING is providing these technologies – in Europe, America and Asia. The HARTING professionals at our international subsidiaries engage in close, partnership based interaction with our customers, right from the very early product development phases, in order to realize customer demands and requirements in the best possible manner.

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

OUR CLAIM: PUSHING PERFORMANCE.

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

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

QUALITY CREATES RELIABILITY – AND WARRANTS TRUST.

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

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

HARTING TECHNOLOGY CREATES ADDED VALUE FOR CUSTOMERS.

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

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

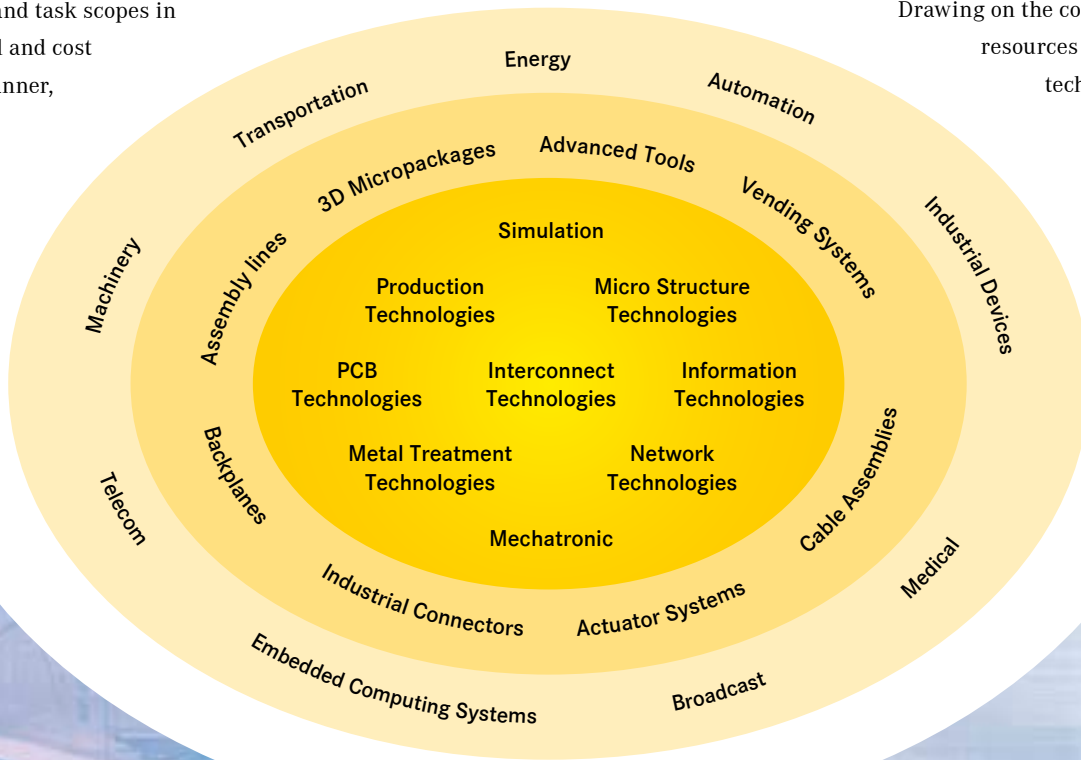
In order to develop connectivity and network solutions serving an exceptionally wide range of connector applications and task scopes in a professional and cost optimized manner, HARTING not only

commands the full array of conventional tools and basic technologies. Over and beyond these capabilities, HARTING is constantly harnessing and refining its broad base of knowledge and experience to create new solutions that ensure continuity at the same time. In securing this know-how lead, HARTING draws on a wealth of sources from both in-house research and the world of applications alike.

Salient examples of these sources of innovative knowledge include microstructure technologies, 3D design and construction technology, as well as high temperature or ultrahigh frequency applications that are finding use in telecommunications or automation networks, in the automotive industry, or in industrial sensor and actuator applications, RFID and wireless technologies, in addition to packaging and housing made of plastics, aluminum or stainless steel.

HARTING SOLUTIONS EXTEND ACROSS TECHNOLOGY BOUNDARIES.

Drawing on the comprehensive resources of the group's technology pool, HARTING devises



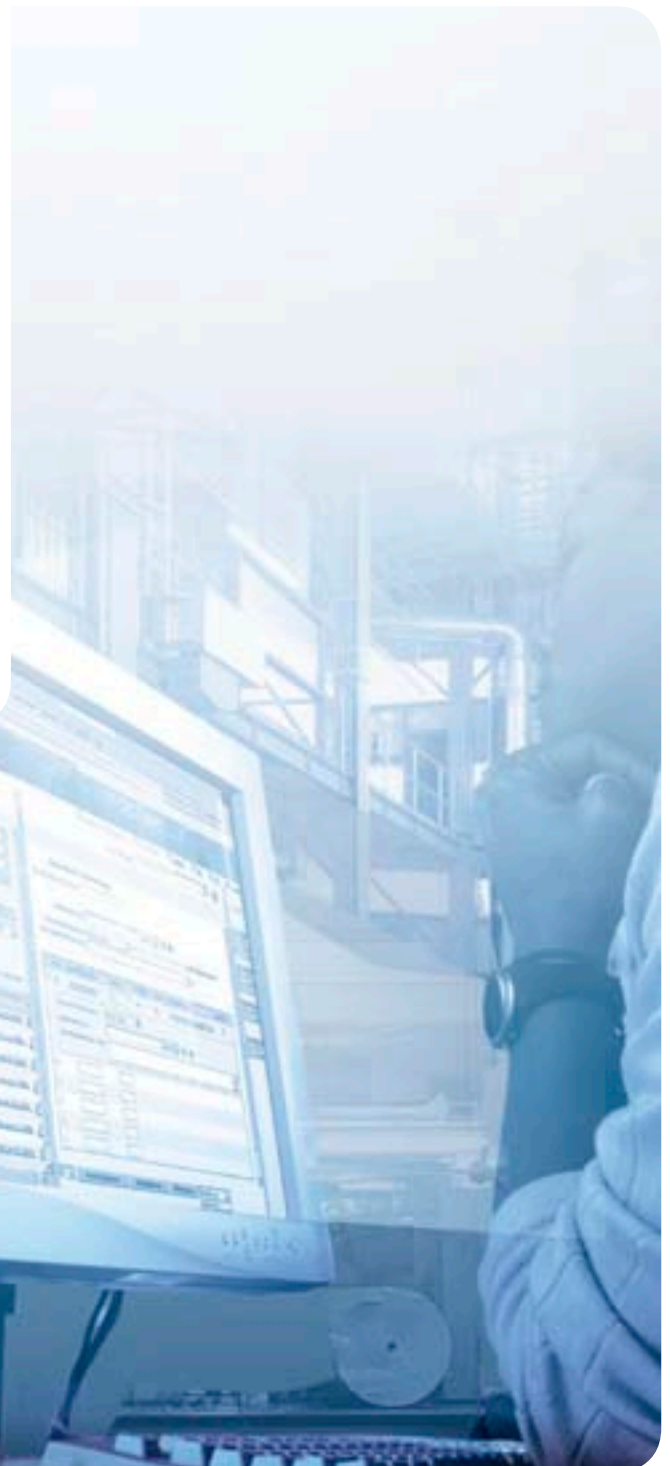
practical solutions for its customers. Whether this involves industrial networks for manufacturing automation, or hybrid interface solutions for wireless telecommunication infrastructures, 3D circuit carriers with microstructures, or cable assemblies for high-temperature applications in the automotive industry - HARTING technologies offer far more than components, and represent mature, comprehensive solutions attuned to individual customer requirements and wishes. The range covers ready-to-use cable configurations, completely assembled backplanes and board system carriers, as well as fully wired and tested control panels.

In order to ensure the future proof design of RF- and EMC-compatible interface solutions, the central HARTING laboratory (certified to EN 45001) provides simulation tools, as well as experimental, testing and diagnostics facilities all the way through to scanning electron microscopes. In the selection of materials and processes, lifecycle and environmental aspects play a key role, in addition to product and process capability considerations.

HARTING KNOWLEDGE IS PRACTICAL KNOW-HOW GENERATING SYNERGY EFFECTS.

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

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



Contents

Page

Installation Technology

Han-Yellock®	11
Han-Yellock® Hoods/Housings	12
Han-Yellock® Modules	18
Han-Yellock® Adapter frames	22
Han-Yellock® Accessories	26
Han-Yellock® Tools	28
 Han®-Eco	 29
Han®-Eco Hoods/Housings	30
Han®-Eco Accessories	35
 Han-Modular®	
Han-Modular® RJ45 Module with RJ Industrial	36
Han-Modular® USB Module, female, with screw termination, with T function	42
Han-Modular® 70 A Module with crimp termination	44
Han-Modular® 200 A Module with crimp termination	46
 Han® 3 A with Han-Quick Lock® termination	 48
 Hoods/Housings	
Han® 3 A EMC Housing, panel feed through	50
Han® 3 A EMC Housing, bulkhead mounting	51
Han® 3 A HPR Housing, bulkhead mounting	52
Han® 3 A HPR Housing, surface mounting	53
Han-INOX® 3 A Hoods/Housings	54

Contents

Page

Han® HC Modular 250 with crimp termination	56
Han-Power®	
Han-Power® S with power supply	58
Han-Power® S with maintenance switch	60
Han® Q 4/2 with axial screw termination	62
Han-Compact® Hoods/Housings metal	64
Han-Compact® Protection cover plastic	66
Crimping tool CP 600	67

Automation IT

Fast Track Switching	68
Ha-VIS FTS 3100s-A	71
Ha-VIS FTS 3100-A	73
Ha-VIS eCon 4000	75
Ha-VIS eCon 4080-BPoE1	77
Ha-VIS mCon	
Ha-VIS mCon Management functions	78

Contents

Page

Ha-VIS mCon 3000	81
Ha-VIS mCon 3082-AFV	84
Ha-VIS mCon 1000	85
Ha-VIS mCon 1042-AASFP	89
Ha-VIS mCon 1083-ASFP-PoE	91
Ha-VIS mCon 1083-ASFP4	93
Ha-VIS pCon 7000	95
Ha-VIS pCon 7150-110/48	96
Ha-VIS pCon 7060-110/24	97
Ha-VIS preLink®	
Ha-VIS preLink® RJ45 jack module	98
Ha-VIS preLink® M12 connector module, male	99
Ha-VIS preLink® mounting tool	100
Industrial Data cables, 8-wire, Category 6	
HARTING Han® 3 A RJ45 Cat. 6 Hybrid 4x1,5	101
Ha-VIS Smart Patch cable IP 20 Cat. 6	103
Cabling system and Components for SERCOS III	105
Ha-VIS EtherRail Data cable, 4-wire, Cat. 5	107

Contents

Page

Device Connectivity

RJ Industrial 10G connectors

General information	108
Connectors	112

har-speed M12 connectors

General information	114
<i>har-speed</i> M12 products	115

D-Sub connectors with ferrite-filter

General information	116
Technical characteristics	117
Connectors with straight solder pins	118
Connectors with right angled solder pins	119
Connectors with solder buckets	120

harmik[®] bellows connectors for SMC

General information	121
Technical characteristics	124
Connectors with right angled solder pins	125

DIN 41612 connectors

Complementary female connectors and shell housings type 2C	126
Complementary mezzanine adapter for types C and 2C	128
Shell housing D 20	130
Male connectors type D	132
Male connectors type E	133
Interface connectors I	134

Contents

Page

Cable assemblies

General information	135
Cable assemblies with <i>har-link</i> [®] , <i>harmik</i> [®] , D-Sub and SEK connectors	136
Cable assemblies with HARTING PushPull and Han [®] 3 A connectors	138

TCA connectors

Technical characteristics for AdvancedMC [™] connectors for MicroTCA [™]	140
AdvancedMC [™] connectors for MicroTCA [™]	141
General information about Plug Connectors	142
Technical characteristics for Plug Connectors	144
Plug Connectors for AdvancedMC [™] moduls	145
General information about MCH Plug Connectors	147
Plug Connectors for MCH moduls	148

Summary Catalogues	152
--------------------------	------------

Addresses	153
-----------------	------------

Description of the Han-Yellock® system

The Han-Yellock® - a special Han® connector

Han-Yellock® is a new product series which retains the core functionality but differs significantly from current size and shape formats. The approach of this series makes many new functions possible, for example:

- ❑ An internal, latched locking mechanism on the hood
- ❑ Multiplies the potentials in the connector with Han-Yellock® modules
- ❑ Usage of Han-Modular® modules with adapter frames
- ❑ Insulators can snap into the front or back walls of the housing
- ❑ Protected Earth contact (PE) in crimp or Quick Lock termination

These new technical features encourage sustained and effective improvements:

When purchasing products –

- ❑ Less article numbers and less inventory,

When planning for the electrical and mechanical layout –

- ❑ Less wiring work within a machine,

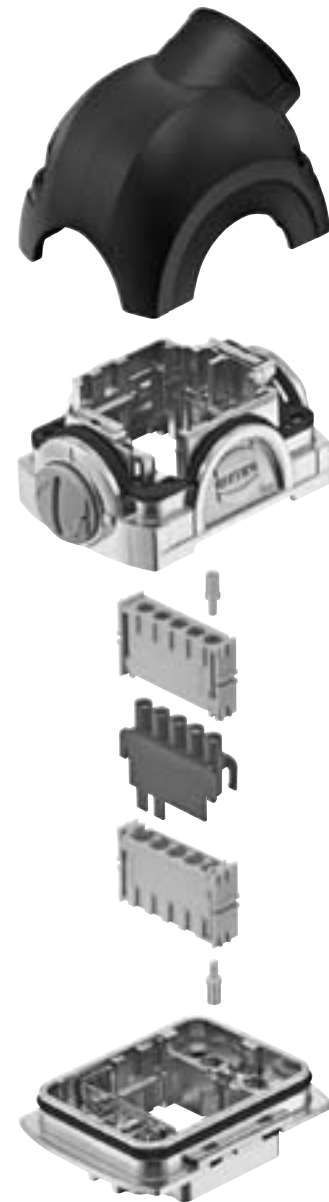
During the work flow –

- ❑ Less steps in the work flow and quicker assembly,

And during the after-sales stage –

- ❑ Reduced down times because of the latched locking mechanism and maintenance-friendly design

Thus, the Han-Yellock® offers improved functionality in the form of increased variability, multiplied potential, simplified handling, reduced incidence of errors and maximized safety.



Assembly details

Design overview

The Han-Yellock® interface consists of a housing, bulkhead mounting, on the housing side and a carrier hood with cover on the cable side.

Han-Yellock® offers the following features when assembling components:

- ❑ Han-Yellock® modules require only male crimp contacts.
- ❑ The PE is contacted on the housing; it can be connected with crimp and/or Quick Lock contacts.
- ❑ The Han-Yellock® hoods/housing are not plug-compatible with all other Han® hood/housing series.

The Han-Yellock® system can be used with a variety of insulators and contact inserts in order to establish an interface.

Features

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

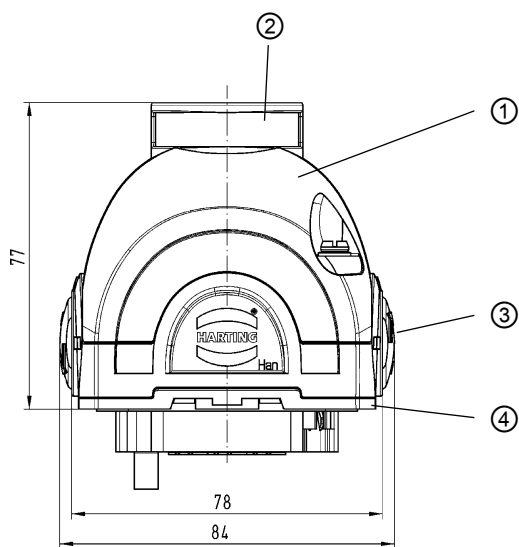
Technical Characteristics

Shell

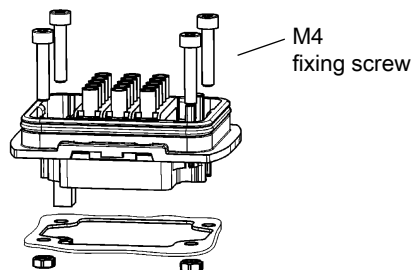
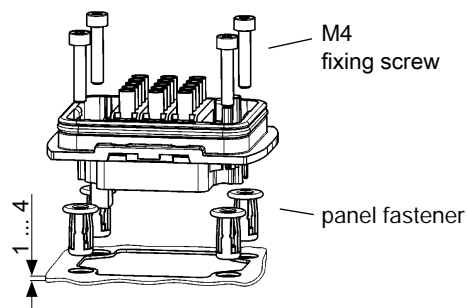
Material	aluminium
Surface	powder-coated
Locking element	
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529 when locking	IP 67
Tightening torque	
M4 fixing screw	1.2 Nm

Carrier hoods and Housings, bulkhead mounting

Number of Han-Yellock® modules	
Han-Yellock® 30	3
Han-Yellock® 60	6
Material	Zinc die-cast
Surface	
Locking element	PA / stainless steel
Hoods/Housings sealing	NBR
Limiting temperatures	-40 °C ... +125 °C
Un-/Locking temperature	-10 °C ... +85 °C
Degree of protection acc. to DIN EN 60 529 when locking	IP 67
Mechanical working life	
- mating cycles	500
PE wire	
termination gauge	≤ 4 mm ²
Tightening torque	
M4 fixing screw	≥ 1 Nm
panel fastener	2.3 Nm




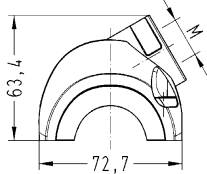
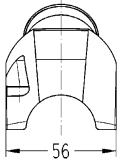
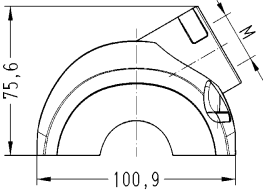
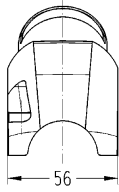

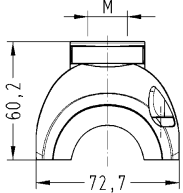
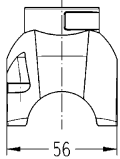
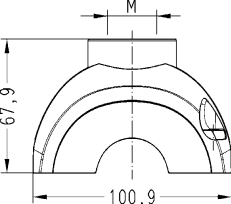
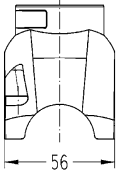
- ① Shell with top entry
- ② cable entry M25
- ③ Carrier hood with push button release
- ④ Housing, bulkhead mounting




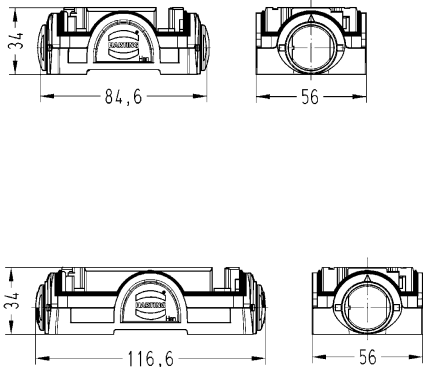

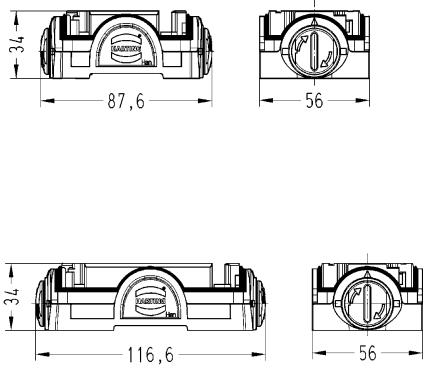

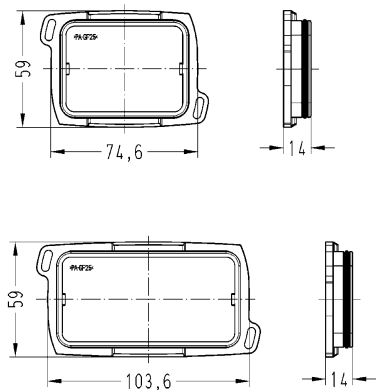
Protection covers

Material	PA
Hoods/Housings sealing	NBR
Degree of protection acc. to DIN EN 60 529 when locking	IP 67
Flammability acc. to UL 94	V0


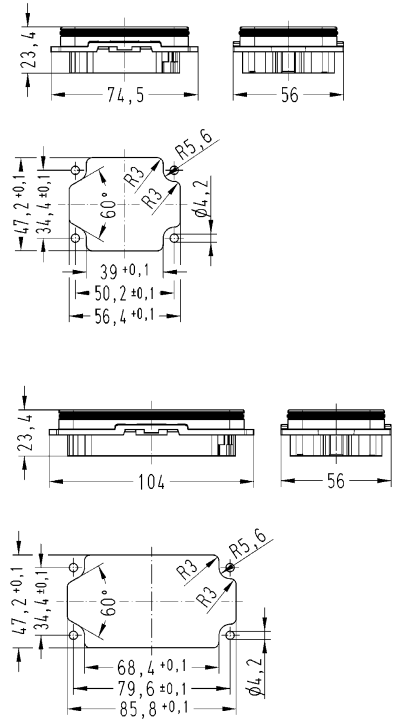

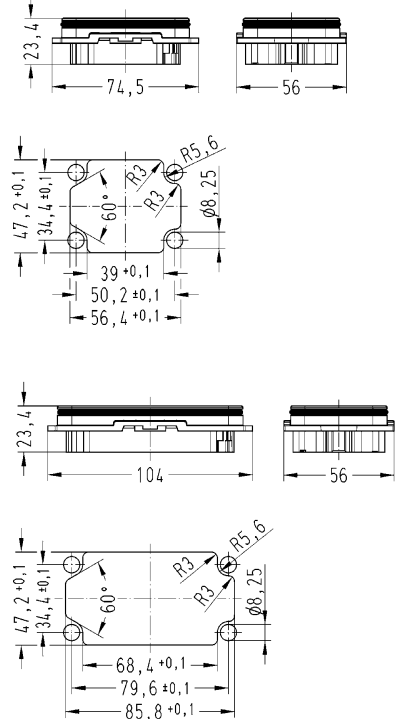
Han-Yellock® Hoods

Identification	Part number	Cable entry metric	Drawing	Dimensions in mm	
<p>Shell side entry</p> <p>Han-Yellock® 30</p> <p><i>Available by May 2010</i></p>  <p>Han-Yellock® 60</p> <p><i>Available by August 2010</i></p>	<p>11 12 300 1500</p> <p>11 12 300 1501</p> <p>11 12 300 1502</p>	<p>M20</p> <p>M25</p> <p>M32</p>			
	<p>11 12 600 1501</p> <p>11 12 600 1502</p> <p>11 12 600 1503</p>	<p>M25</p> <p>M32</p> <p>M40</p>			
	<p>Shell top entry</p> <p>Han-Yellock® 30</p> <p><i>Available by May 2010</i></p>  <p>Han-Yellock® 60</p> <p><i>Available by August 2010</i></p>	<p>11 12 300 1400</p> <p>11 12 300 1401</p> <p>11 12 300 1402</p>	<p>M20</p> <p>M25</p> <p>M32</p>		
		<p>11 12 600 1401</p> <p>11 12 600 1402</p> <p>11 12 600 1403</p>	<p>M25</p> <p>M32</p> <p>M40</p>		

Han-Yellock® Hoods

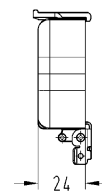
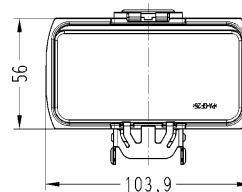
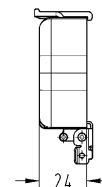
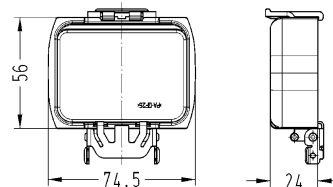
Identification	Part number	Cable entry metric	Drawing	Dimensions in mm
<p>Carrier hood plain push button</p>  <p>Han-Yellock® 30 <i>Available by May 2010</i></p> <p>Han-Yellock® 60 <i>Available by August 2010</i></p>	<p>11 12 300 0100</p> <p>11 12 600 0101</p>	<p>-</p> <p>-</p>		<p>84,6</p> <p>56</p> <p>116,6</p> <p>56</p>
<p>Carrier hood push button, slot</p>  <p>Han-Yellock® 30 <i>Available by May 2010</i></p> <p>Han-Yellock® 60 <i>Available by August 2010</i></p>	<p>11 12 300 0110</p> <p>11 12 600 0100</p>	<p>-</p> <p>-</p>		<p>87,6</p> <p>56</p> <p>116,6</p> <p>56</p>
<p>Protection cover for carrier hoods with cord</p>  <p>Han-Yellock® 30 <i>Available by August 2010</i></p> <p>Han-Yellock® 60 <i>Available by September 2010</i></p>	<p>11 12 300 5451</p> <p>11 12 600 5451</p>			<p>74,6</p> <p>59</p> <p>14</p> <p>103,6</p> <p>59</p> <p>14</p>

Han-Yellock® Housings

Identification	Part number	Cable entry metric	Drawing	Dimensions in mm
<p>Housing, bulkhead mounting</p>  <p>Han-Yellock® 30</p> <p><i>Available by May 2010</i></p> <p>Han-Yellock® 60</p> <p><i>Available by August 2010</i></p>	<p>11 12 300 0301</p> <p>11 12 600 0301</p>			
<p>Housing, bulkhead mounting</p>  <p>Han-Yellock® 30</p> <p>Set consists of Han-Yellock® 30 housing, bulkhead mounting and panel fastener</p> <p><i>Available by May 2010</i></p> <p>Han-Yellock® 60</p> <p>Set consists of Han-Yellock® 60 housing, bulkhead mounting and panel fastener</p> <p><i>Available by August 2010</i></p>	<p>11 12 300 0302</p> <p>11 12 600 0302</p>			

Han-Yellock® Housings

Identification	Part number	Cable entry metric	Drawing	Dimensions in mm
<p>Protection cover for housings, bulkhead mounting</p> <p>Han-Yellock® 30</p> <p>Set consists of protection cover and bearing pedestal</p> <p><i>Available by September 2010</i></p>	11 12 300 5401			
<p>Han-Yellock® 60</p> <p>Set consists of protection cover and bearing pedestal</p> <p><i>Available by September 2010</i></p>	11 12 600 5401			

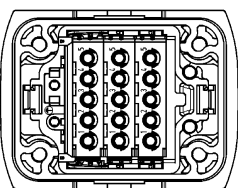




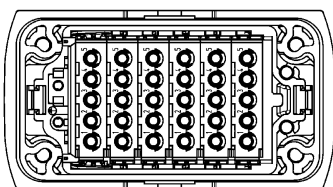
Features

- Snap-in assembly from mating side and from termination side
- Wiring with male contacts only
- Bus bar within bridge attachments
- Finger safe design
- Fast and tool-less assembly

Placement for Han-Yellock® 30
with 3 Han-Yellock® modules



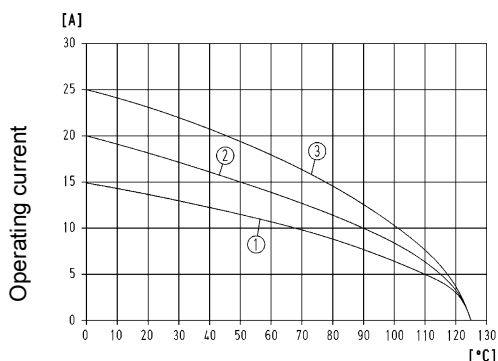
Placement for Han-Yellock® 60
with 6 Han-Yellock® modules



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



Ambient temperature

① Wire gauge: 1.5 mm²

② Wire gauge: 2.5 mm²

③ Wire gauge: 4.0 mm²

for connector with 3 Han-Yellock® modules, fully loaded
(multiplier 1:1)

Technical Characteristics

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

Modules

Electrical data acc. to DIN EN 61 984	20 A 500 V 6 kV 3
Rated current	20 A
Rated voltage	500 V
Rated impulse voltage	6 kV
Pollution degree	3
Pollution degree 2 also	20 A 690 V 8 kV 2

Insulation resistance	≥ 10 ¹⁰ Ω
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V0
Mechanical working life - mating cycles	≥ 500

Contacts

Material	copper alloy
Surface	
- hart-silver plated	3 μm Ag
Contact resistance	≤ 2 mΩ
Crimp terminal	
- wire gauge ¹⁾	0.14 ... 4 mm ²
- AWG	26 ... 12
- Stripping length	6.5 mm

Number of contacts

5

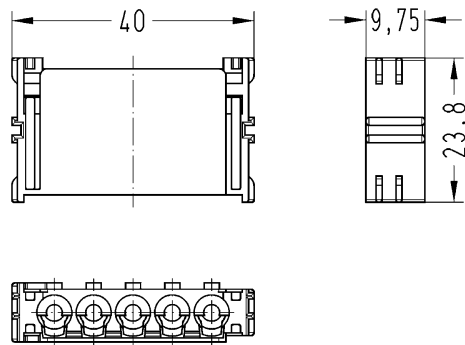


Identification Part number Drawing Dimensions in mm

Han-Yellock® module

Available by
May 2010

11 05 105 3001



Identification Wire gauge (mm²) Part number Drawing Dimensions in mm

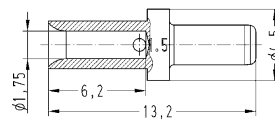
Han-Yellock® Crimp contacts
male contact Han-Yellock® TC20

silver-plated



Available by
May 2010

0.14-0.37	11 05 000 6101
0.5	11 05 000 6102
0.75	11 05 000 6103
1.0	11 05 000 6104
1.5	11 05 000 6105
2.5	11 05 000 6106
3.0	11 05 000 6107
4.0	11 05 000 6108



Wire gauge		Stripping length
0.14 - 0.37 mm²	AWG 26-22	6.5 mm
0.5 mm²	AWG 20	6.5 mm
0.75 mm²	AWG 18	6.5 mm
1 mm²	AWG 18	6.5 mm
1.5 mm²	AWG 16	6.5 mm
2.5 mm²	AWG 14	6.5 mm
3 mm²	AWG 12	6.5 mm
4 mm²	AWG 12	6.5 mm

Removal tool for crimp contacts

09 99 000 0319



Features

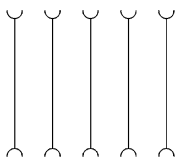
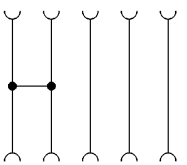
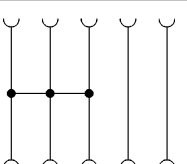
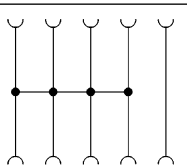
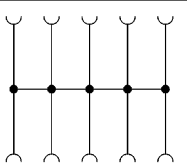
- Visible bridge position from mating side and from termination side
- Multiplier can be placed on the housing side or on the cable side
- Bus bar functionality for 1 up to 5 contacts
- Fast and easy exchange

Technical Characteristics

Specifications DIN EN 60 664-1
DIN EN 61 984

Multiplier

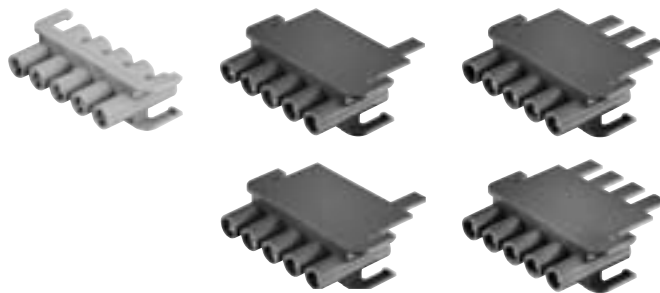
Number of contacts 5
 Material Polycarbonate
 Flammability acc. to UL 94 V0
 Mechanical working life
 - mating cycles ≥ 500

	Bus bar contacts	Single contacts	Circuit diagram
multiplier 1:1	0	5	
multiplier 2:3	2	3	
multiplier 3:2	3	2	
multiplier 4:1	4	1	
multiplier 5:0	5	0	

Number of contacts

5

Available by
May 2010



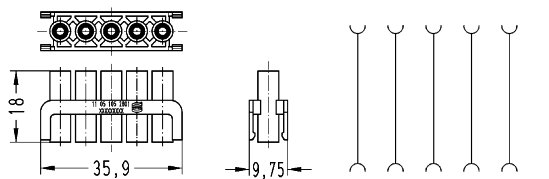
Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Han-Yellock® multiplier

multiplier 1:1



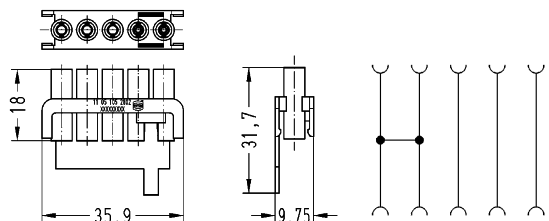
11 05 105 2801



multiplier 2:3



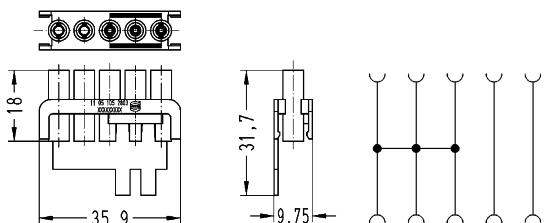
11 05 105 2802



multiplier 3:2



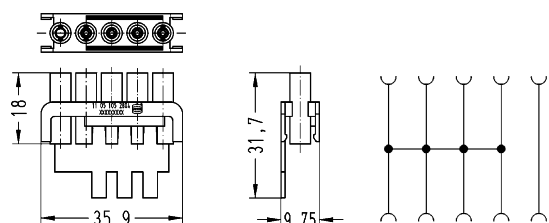
11 05 105 2803



multiplier 4:1



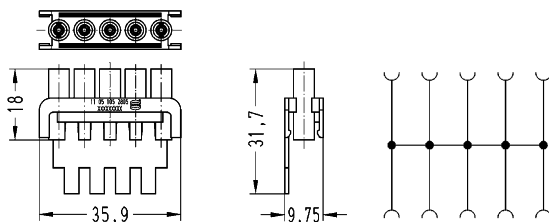
11 05 105 2804



multiplier 5:0



11 05 105 2805



Features

- Suitable for Han-Modular® modules up to 4 mm²
- Snap-in functionality from mating side and from termination side

Technical Characteristics

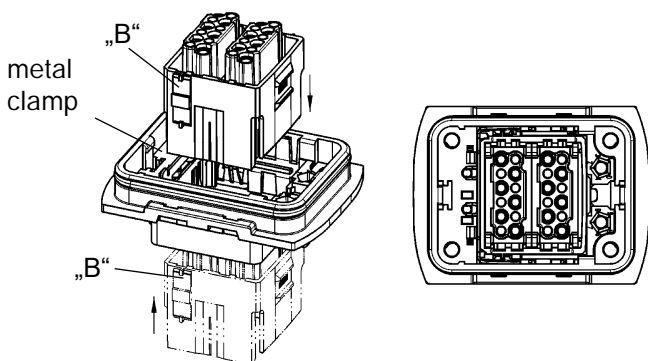
Specifications	DIN EN 60 664-1 DIN EN 61 984
----------------	----------------------------------

Adapter frames

Number of modules	max. 2
Material	Polycarbonate
Flammability acc. to UL 94	V0

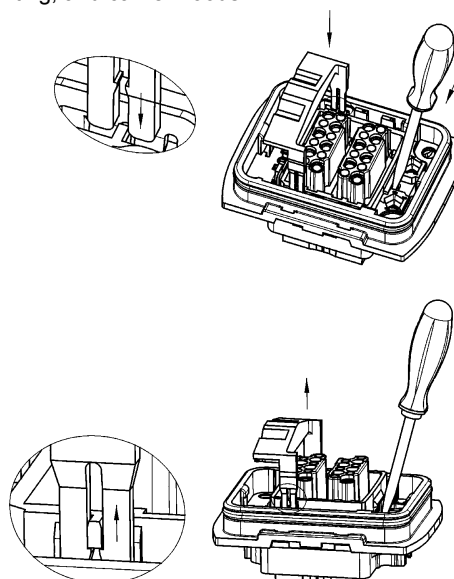
Mounting

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



Removal

- The removal tool part no. 09 99 000 0001 is required for removal.
- The removal tool is inserted into the metal clamp and pressed down as shown in the following illustration. A screwdriver can also be placed into the notch in the housing.
- The removal tool should then be pulled outwards to remove the adapter frame from the housing.
- The removal can be made from the connection side as well as from the plug-in side.
- The process is identical for both housings, bulkhead mounting, and carrier hoods.



Available by
May 2010



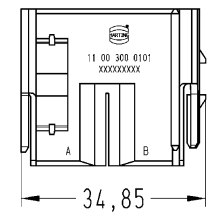
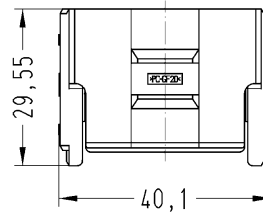
Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Han-Yellock® Adapter frame

for carrier hoods



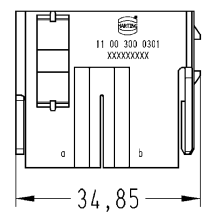
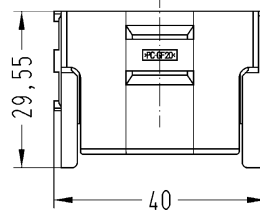
11 00 300 0101



for housings, bulkhead mounting







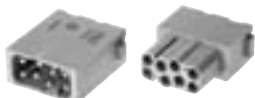

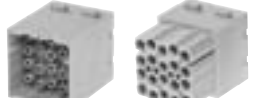

11 00 300 0301


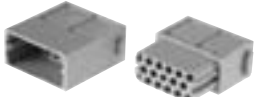
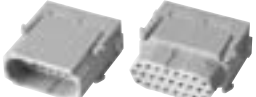



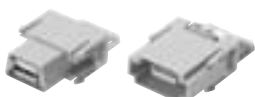
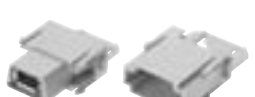


Summary Han-Modular®



Modules	Han® CC Protected module	Han® CD module	Han E® module	Han® EE module
Number of contacts	4	3 / 4	6	8
Termination	Crimp terminal	Crimp terminal	Crimp terminal	Crimp terminal
				
Rated current	40 A	40 A / 10 A	16 A	16 A
Rated voltage	830 V	830 V / 830 V	500 V	400 V
Wire gauge	1.5 - 6 mm ²	1.5 - 6 mm ² / 0.14 - 2.5 mm ²	0.5 - 4 mm ²	0.5 - 4 mm ²

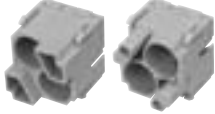
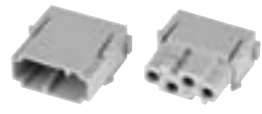








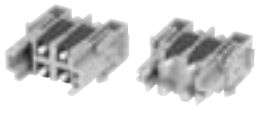



Modules	Han® EE module	Han E® Protected module	Han® EEE module	Han® ES module
Number of contacts	8	6	20	5
Termination	Quick Lock terminal	Crimp terminal	Crimp terminal	Cage-clamp terminal
				
Rated current	16 A	16 A	16 A	16 A
Rated voltage	400 V	830 V	500 V	400 V
Wire gauge	0.5 - 2.5 mm ²	0.5 - 4 mm ²	0.5 - 4 mm ²	0.14 - 2.5 mm ²

Modules	Han DD® module	Han® DDD module	Han® High Density module	Han® D-Sub module
Number of contacts	12	17	25	9
Termination	Crimp terminal	Crimp terminal	Crimp terminal	Crimp terminal
				
Rated current	10 A	10 A	4 A	5 A
Rated voltage	250 V	160 V	50 V	50 V
Wire gauge	0.14 - 2.5 mm ²	0.14 - 2.5 mm ²	0.08 - 0.52 mm ²	0.08 - 0.52 mm ²


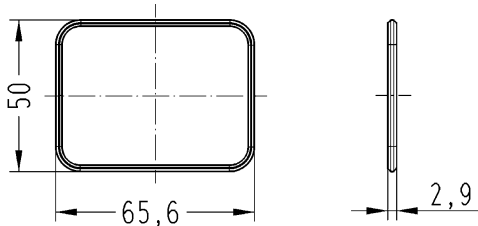
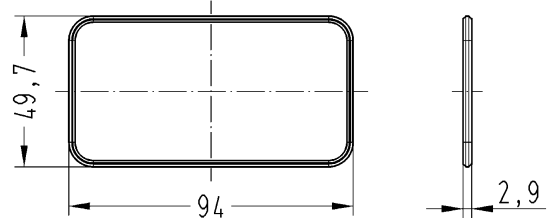

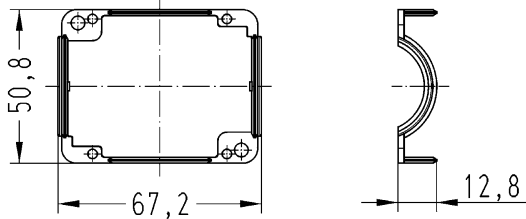
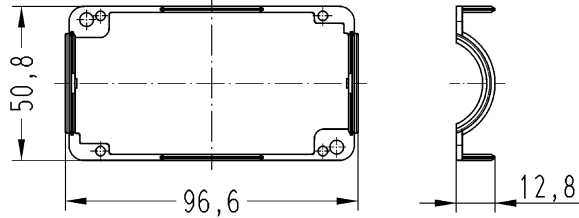

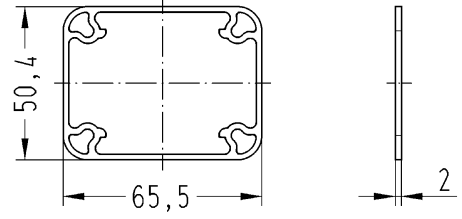
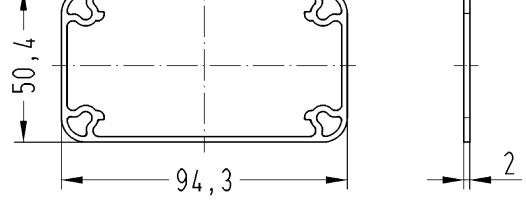
Modules	Han® USB module	Han® FireWire module	Han® RJ45 module	Han® GigaBit module
Number of contacts	4	6	8	8
Termination	USB 2.0	IEEE 1394	Ethernet Cat. 5e	Ethernet Cat. 6
				


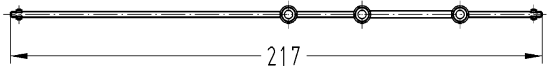

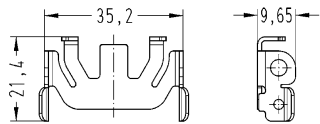

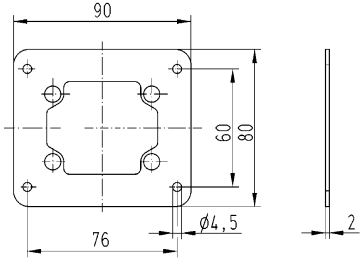
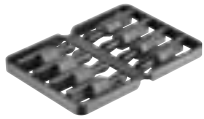
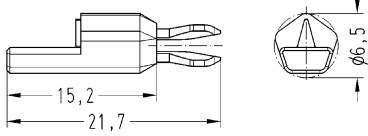

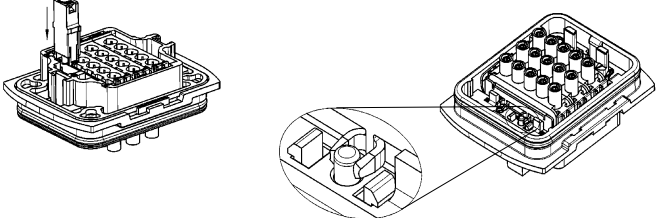
Summary Han-Modular®



Summary Han-Modular®						
Modules	Han-Quintax® module				Han® Multi Contact module	
Number of contacts	2				4	
						
Contacts	Quintax contact 4 + shielding	High Density Quintax contact 8 + shielding	Han D® Coax contact 1 + shielding	Han E® Coax contact 1 + shielding	F.O. contact	Coaxial contact
						
			75 Ω	50 Ω	Multimode F.O. HCS®*/PCF F.O. 1 mm POF	50 Ω RG 174 75 Ω RG 179 50 Ω RG 58
Modules	Han® Pneumatic module		Han® SC module			
Number of contacts	2	3	4			
						
Contacts	Pneumatic contacts		SC contact			
						
	∅ 6.0 mm	∅ 1.6 mm ∅ 3.0 mm ∅ 4.0 mm				

* HCS®=Hard Clad Silica (is registered trade mark of SpecTran Corporation)

Identification	Part number	Drawing	Dimensions in mm
<p>Han-Yellock® Profile seal</p>  <p>for Han-Yellock® 30</p> <p>Available by May 2010</p>	11 00 300 9501		
<p>for Han-Yellock® 60</p> <p>Available by August 2010</p>	11 00 600 9501		
<p>Han-Yellock® Seal for carrier hoods</p>  <p>for Han-Yellock® 30</p> <p>Available by May 2010</p>	11 00 300 9502		
<p>for Han-Yellock® 60</p> <p>Available by August 2010</p>	11 00 600 9502		
<p>Han-Yellock® Gasket</p>  <p>for Han-Yellock® 30</p> <p>Available by May 2010</p>	11 00 300 9503		
<p>for Han-Yellock® 60</p> <p>Available by August 2010</p>	11 00 600 9503		

Identification	Part number	Drawing	Dimensions in mm
<p>Han-Yellock® Fixing cord for protection cover cable side</p>  <p><i>Available by August 2010</i></p>	11 00 000 9507		
<p>Han-Yellock® Bearing pedestal</p>  <p><i>Available by September 2010</i></p>	11 00 000 9506		
<p>Han-Yellock® 30 Adapter plate circular 68 mm punch to Han-Yellock® panel cut out</p>  <p><i>Available by August 2010</i></p>	11 00 300 9601		
<p>Han-Yellock® Identification sticks</p> <p><i>Available by May 2010</i></p>	11 00 000 9601		
<p>Han-Yellock® Coding pins Set of 8 coding pins</p>  <p><i>Available by May 2010</i></p>	11 00 000 9501		
<p>PE Contact chamber with Quick Lock termination</p>  <p><i>Available by May 2010</i></p>	11 05 001 2601		

Identification	Part number	Drawing	Dimensions in mm
<p>BUCHANAN crimping tool</p> <p>Locator Han- Yellock®</p> <p>Multiple crimping tool depth adjustment gauge</p>	<p>09 99 000 0001</p> <p>09 99 000 0342</p> <p>09 99 000 0379</p>	<p>Wire gauge 0.14 ... 4 mm²</p> <p>Wire gauge 0.14 ... 0.37 mm² Ø 1.00 0.5 ... 1.0 mm² Ø 1.55 1.5 ... 2.5 mm² Ø 1.80 3.0 ... 4.0 mm² Ø 2.00</p>	 <p>order separately</p>
<p>HARTING crimping tool</p> <p>Han D®, Han E®, Han® C locator included</p> <p>Locator Han- Yellock®</p>	<p>09 99 000 0110</p> <p>09 99 000 0341</p>	<p>Wire gauge 0.5 ... 4 mm²</p>	
<p>HARTING Service crimping tool</p> <p>Han D®, Han E® locator included</p> <p>Locator Han- Yellock®</p>	<p>09 99 000 0021</p> <p>09 99 000 0343</p>	<p>Wire gauge 0.14 ... 1.5 mm²</p>	
<p>Removal tool</p> <p>for Han- Yellock® modules and frames</p>	<p>11 99 000 0001</p>		
<p>Removal tool for crimp contacts</p>	<p>09 99 000 0319</p>		<p>This removal tool is necessary if contacts are to be replaced in the insert. The tool is inserted from the wiring side until a stop is noticeable. The wire with the crimp contact can then be pulled out from the same side of the insert.</p>
<p>Panel Punch</p> <p>panel cut out tool</p> <p>panel thickness steel: ≤ 2.5 mm</p> <p>stainless steel: ≤ 2.0 mm</p> <p>for hydraulic pump</p> <p>punch force: ≥ 60 kN</p> <p>thread: 3/4" UNF</p> <p>for Han- Yellock® 30</p>	<p>11 99 300 0001</p>		

Description of the Han®-Eco series



Han®-Eco – a new hoods and housings series made of thermoplastic material.

Han®-Eco is the ideal solution for applications that do not require the full range of product features offered by the Han® B series of hoods and housings, and users want to take advantage of the weight and cost advantages.

Like the Han® B standard series, the Han®-Eco series is available in the following sizes: 6 B, 10 B, 16 B and 24 B. Depending on size, versions of the hoods with straight or angled cable exit as well as housings, bulkhead mounting, can be supplied. The cable exits are available with metric threading, a cable gland is implemented. For hoods/housing sizes 6 B and 10 B size of the cable gland is M 32, for 16 B and 24 B the size of cable gland is M 40.

Han®-Eco hoods and housings are made of high-performance plastic that is highly resistant to environmental stress and – in combination with the design - provides very good mechanical stability. When the connector is closed and locked, it provides IP 65 protection as defined in DIN EN 60 529. The material also meets demanding flammability requirements of UL 94 Class V 0.

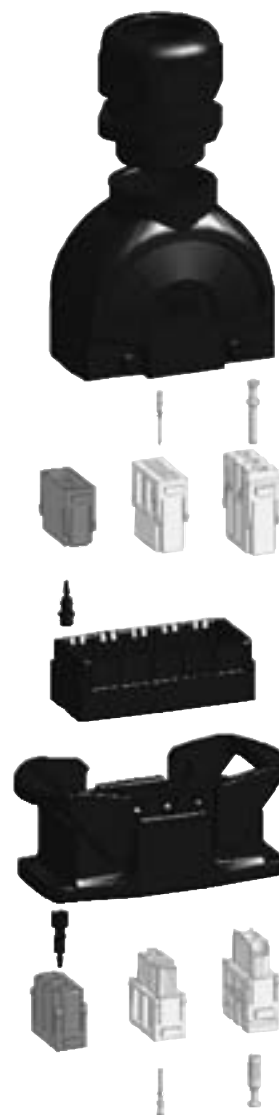
Fast, simple assembly is another outstanding product feature. Click-and-mate design totally eliminates the need for tools during assembly of the Han®-Eco hoods and housings.

The Han®-Eco hoods and housings are compatible with the full range of modules from the Han-Modular® series. One extra module fits into the Han®-Eco hoods and housings compared to the equivalent product in the Han® B Standard series. This special feature applies to all four sizes.

A optional PE contact module with screw terminal has been developed specifically for the Han®-Eco hoods and housings to hold the protective ground conductor.

Advantages:

- weight reduction combined with mechanical strength
- fast assembly process without tools
- complete range of modules from Han-Modular® series usable



Assembly details

Features

- New hoods/housings series made of thermoplastic material with excellent mechanical properties and high resistance against environmental influence
- Weight and cost optimised
- Quick assembly without screws and tools („click and mate“)
- Capable for applications according protection class II
- Available in sizes 6 B, 10 B, 16 B and 24 B
- integrated cable glands
- Complete range of modules of series Han-Modular[®] is usable
- One extra module fits into the Han[®]-Eco hoods/housings compared to equivalent size of Han[®] B series
- Optional PE contact module for hold the protective ground conductor
- Same panel cut out as Han[®] B housings, bulk-head mounting
- Not mating compatible with series Han[®] B

Technical characteristics


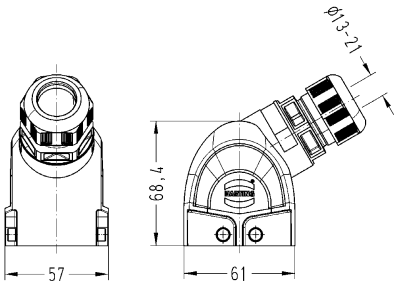

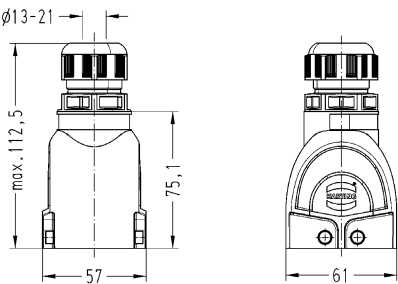
Specifications

DIN EN 61 984


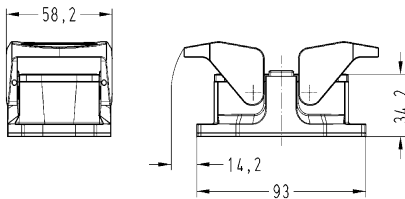
Hoods/Housings

Material	Polyamide, fibre-glass reinforced
Locking element	PA
Hoods/Housings sealing	NBR
Limiting temperatures	-40 °C ... +125 °C
Degree of protection acc. to DIN EN 60 529	IP 65
for coupled connector	IP 65
Flammability acc. to UL 94	V0

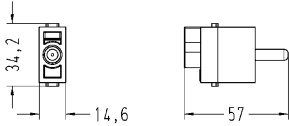
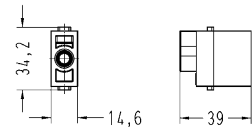
Plastic hoods for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hoods side entry 	19 41 106 0522	M32		
Hoods top entry 	19 41 106 0422	M32		


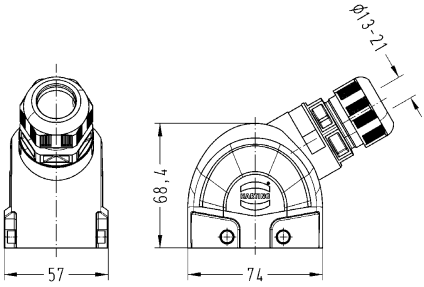

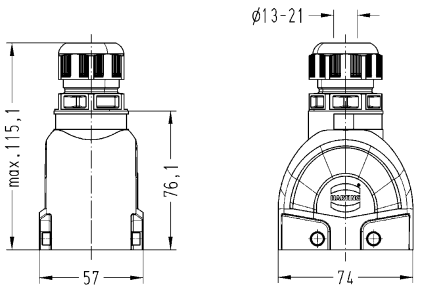
Plastic housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	19 41 006 0301			


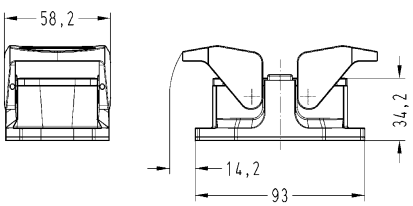
PE contact modules

Identification	Part number	Drawing	Dimensions in mm
Han®-Eco PE contact module with screw terminal wire gauge 1.5 mm ² ... 16 mm ² male module	19 41 001 2600		
female module	19 41 001 2700		

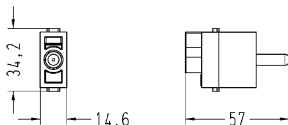
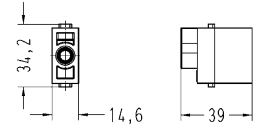
Plastic hoods for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hoods side entry 	19 41 110 0522	M32		
Hoods top entry 	19 41 110 0422	M32		


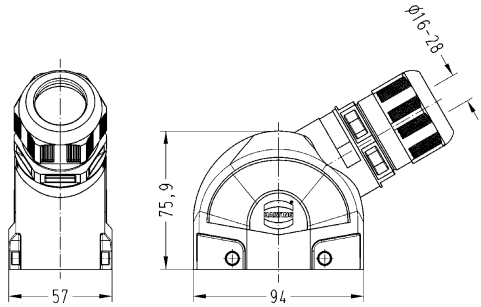

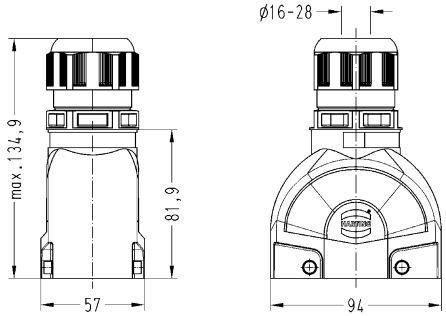
Plastic housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	19 41 010 0301			


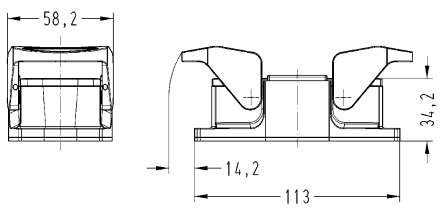
PE contact modules

Identification	Part number	Drawing	Dimensions in mm
Han®-Eco PE contact module with screw terminal wire gauge 1.5 mm ² ... 16 mm ² male module	19 41 001 2600		
female module	19 41 001 2700		

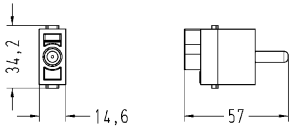
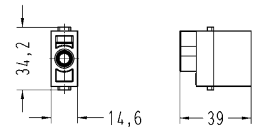
Plastic hoods for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hoods side entry 	19 41 116 0523	M40		
Hoods top entry 	19 41 116 0423	M40		


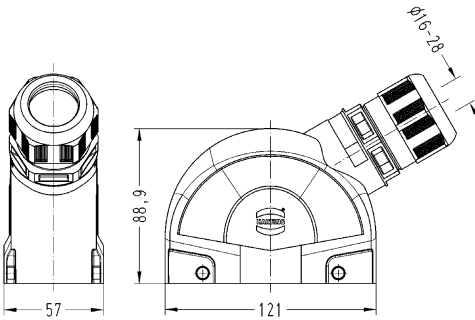

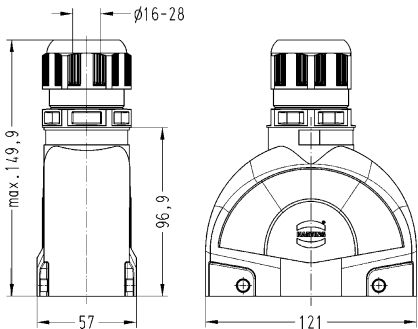
Plastic housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	19 41 016 0301			


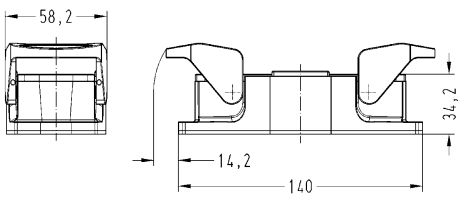
PE contact modules

Identification	Part number	Drawing	Dimensions in mm
Han®-Eco PE contact module with screw terminal wire gauge 1.5 mm ² ... 16 mm ² male module	19 41 001 2600		
female module	19 41 001 2700		

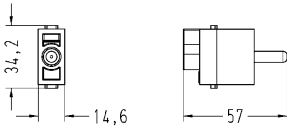
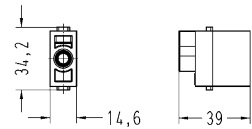
Plastic hoods for industrial applications / 2 lever locking system

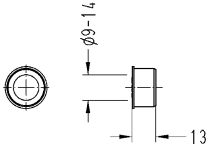
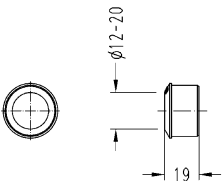
Identification	Part number	Cable entry	Drawing	Dimensions in mm
Hoods side entry 	19 41 124 0523	M40		
Hoods top entry 	19 41 124 0423	M40		

Plastic housings for industrial applications / 2 lever locking system

Identification	Part number	Cable entry	Drawing	Dimensions in mm
Housings, bulkhead mounting 	19 41 024 0301			

PE contact modules

Identification	Part number	Drawing	Dimensions in mm
Han®-Eco PE contact module with screw terminal wire gauge 1.5 mm ² ... 16 mm ² male module	19 41 001 2600		
female module	19 41 001 2700		

Identification	Part number	Drawing	Dimensions in mm
<p>Han®-Eco Reduction sealing insert</p> <p>size of cable gland: M32</p>	<p>19 41 000 5132</p>		
<p>size of cable gland: M40</p>	<p>19 41 000 5142</p>		

Features

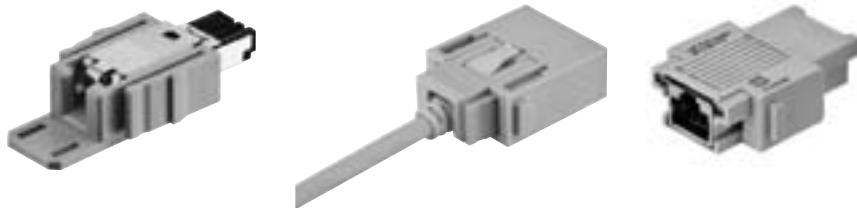
- Single module with standard shielded RJ45 plug and jack
- Cat. 5e for all data pairs (all 8 pins)
- RoHS compliant
- The RJ45 inserts are protected by means of a rugged plastic insulator
- Patch cables are assembled/removed without tools within the module
- RJ Industrial connectors: field assembly possible

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984 IEC 60 603-7
Inserts	
Number of contacts	8
Transmission performance	Cat. 5/class D up to 100 MHz acc. to ISO/IEC 11 801:2002 and EN 50 173-1
Transmission rate	10/100 Mbit/s
Insulation resistance	$\geq 10^{10} \Omega$
Material	Polycarbonate
Limiting temperatures	-40 °C ... +85 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Number of contacts

8

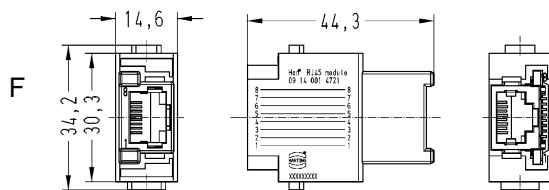


Identification	Part-Number		Drawings	Dimensions in mm
	Male insert (M)	Female insert (F)		

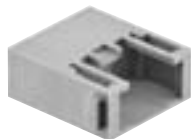
Gender Changer
for patch cable



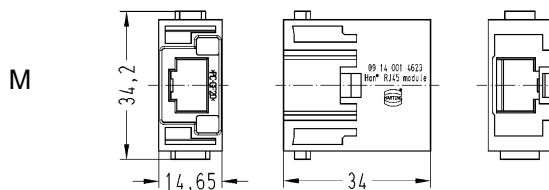
09 14 001 4721



Male module
for patch cable



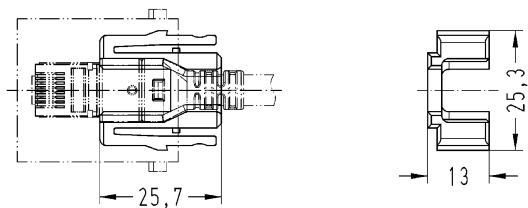
09 14 001 4623



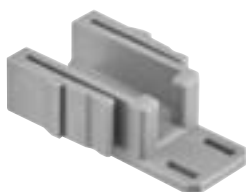
Adapter for HARTING patch cable



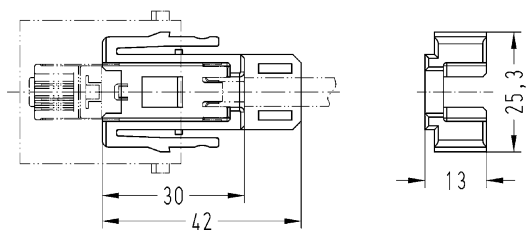
09 14 000 9966



HARTING RJ Industrial



09 14 000 9967



Features

- RoHS compliant
- 360° shielded contact

Han-Modular® RJ Industrial RJ 45 connector set (4 pins, and 10G, 8 pins)

- field assembly without tools possible by means of HARAX® rapid termination in IDC technology
- suitable for termination of massive and flexible wires

Han-Modular® RJ Industrial Gigalink RJ 45 connector set,

- field assembly by means of piercing contacts
- suitable for termination of flexible wires

Technical characteristics

<p>Specifications</p>	<p>DIN EN 60 664-1 DIN EN 61 984 IEC 60 603-7</p>
<p>Inserts</p>	
<p>HARTING RJ Industrial® 4 pins</p>	
<p>Number of contacts</p>	<p>4</p>
<p>Transmission performance</p>	<p>Cat. 5/class D up to 100 MHz acc. to ISO/IEC 11 801:2002 and EN 50 173-1</p>
<p>Transmission rate</p>	<p>10/100 Mbit/s</p>
<p>Termination</p>	<p>without tools by means of IDC contacts</p>
<p>Terminated cable</p>	
<p>- wire gauge flexible</p>	<p>AWG 24/7 ... AWG 22/7</p>
<p>massive</p>	<p>AWG 23/1 ... AWG 22/1</p>
<p>- outer wire diameter</p>	<p>max. 1.6 mm</p>
<p>Material insert</p>	<p>Polyamide, UL 94 V0</p>
<p>Limiting temperatures</p>	<p>-40 °C ... +70 °C</p>
<p>HARTING RJ Industrial® Gigalink, 8 pins</p>	
<p>Number of contacts</p>	<p>8</p>
<p>Transmission performance</p>	<p>Cat. 6/class E up to 250 MHz acc. to ISO/IEC 11 801:2002 and EN 50 173-1</p>
<p>Transmission rate</p>	<p>10/100/1000 Mbit/s</p>
<p>Termination</p>	<p>by means of piercing contacts</p>
<p>Terminated cable</p>	
<p>- wire gauge</p>	<p>AWG 28/7 ... AWG 24/7 (flexible)</p>
<p>- outer wire diameter</p>	<p>max. 1.05 mm</p>
<p>Material insert</p>	<p>Polyamide, UL 94 V0</p>
<p>Limiting temperatures</p>	<p>-40 °C ... +70 °C</p>
<p>HARTING RJ Industrial® 10G, 8 pins</p>	
<p>Number of contacts</p>	<p>8</p>
<p>Transmission performance</p>	<p>Cat. 6/class E_A up to 250 MHz acc. to ISO/IEC 11 801:2002 and EN 50 173-1</p>
<p>Transmission rate</p>	<p>10/100/1000 Mbit/s</p>
<p>Termination</p>	<p>without tools by means of IDC contacts</p>
<p>Terminated cable</p>	
<p>- wire gauge flexible</p>	<p>AWG 27/7 ... AWG 22/7</p>
<p>massive</p>	<p>AWG 27/1 ... AWG 22/1</p>
<p>- outer wire diameter</p>	<p>max. 1.5 mm</p>
<p>Material insert</p>	<p>Polyamide, UL 94 V0</p>
<p>Limiting temperatures</p>	<p>-40 °C ... +70 °C</p>



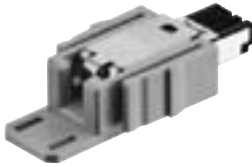
Identification

Part-Number

Drawings

Dimensions in mm

Han-Modular® RJ Industrial RJ45 connector set



Cat. 5

4 pins for AWG 24 ... 22

4 pins for AWG 26

Cat. 6

Gigalink, 8 pins with cable manager white

Gigalink, 8 pins with cable manager blue

Cat. 6

10G, 8 pins

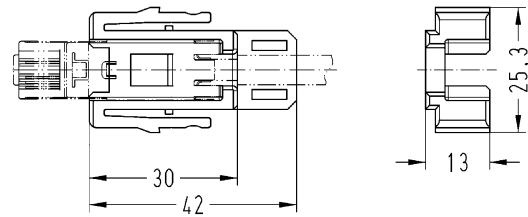
09 45 400 1100

09 45 400 1109

09 45 400 1500

09 45 400 1510

09 45 400 1560



Set consists of the relevant RJ45 insert and the suitable adapter for Han® RJ45 male module 09 14 001 4623

HARTING RJ Industrial® Gigalink assembly tool

09 45 800 0500

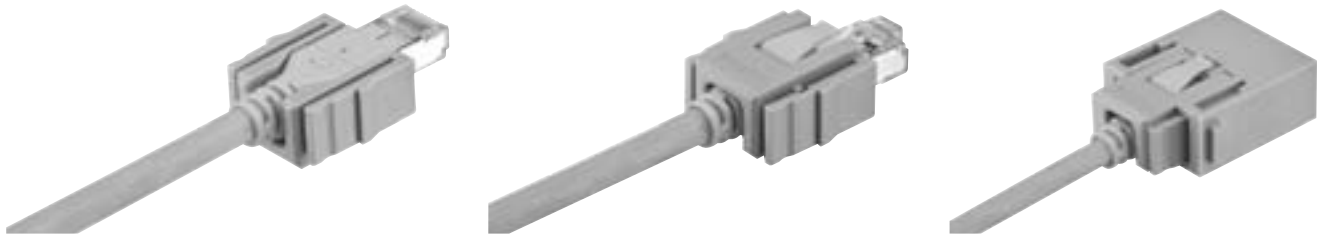


Features

- Locking lever protection for RJ45 connector latch
- Very short plug design in combination with robust bend protection
- RoHS compliant

Technical characteristics

Specifications	ISO/IEC 24 702 ISO/IEC 11801 ISO/IEC 61 935-2
Cat. 5e RJ45 patch cable	
Transmission performance	Cat. 5/ Class D acc. to ISO/IEC 24 702 resp. ISO/IEC 11801 Cat. 5e acc. to ISO/IEC 61 935-2
Transmission rate	1 Gigabit Ethernet 1000 Mbit/s
Wiring	1:1 TIA/EIA 568 B, 8-pole
Material cable	SF/UTP, PUR jacket, yellow
Operating temperatures	
mobile	0 °C ... +60 °C
stationary	-40 °C ... +80 °C
Flammability	flame retardant, halogen-free
Protection class	IP 20
Cat. 6 RJ45 patch cable	
Transmission performance	Cat. 6/ Class E acc. to ISO/IEC 24 702 resp. ISO/IEC 11801 Cat. 6 acc. to ISO/IEC 61 935-2
Transmission rate	1 Gigabit Ethernet 1000 Mbit/s
Wiring	1:1 TIA/EIA 568 B, 8-pole
Material cable	S/FTP, PUR jacket, yellow
Operating temperatures	
mobile	0 °C ... +60 °C
stationary	-20 °C ... +80 °C
Flammability	flame retardant, halogen-free
Protection class	IP 20



Identification	Part-Number Male insert (M)	Drawings	Dimensions in mm
----------------	--------------------------------	----------	------------------

Identification	Part-Number Male insert (M)	Drawings	Dimensions in mm
Cat 5e RJ45			
patch cable			
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	

Cat 6 RJ45			
patch cable			
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	

Features

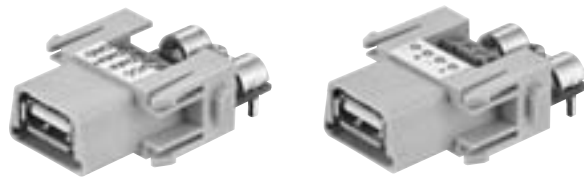
- According to USB 2.0 specification
- Screw terminal for max. 1.5 mm²
- T functionality as an option

Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984
Inserts	
Number of contacts	4
Electrical data acc. to DIN EN 61 984	1 A 50 V 0.8 kV 3
Rated current	1 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	≥ 10 ¹⁰ Ω
Material	Polycarbonate
Limiting temperatures	-40 °C ... +85 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

Number of contacts

4



USB module with screw termination

Identification	Part-Number Female insert (F)	Drawings	Dimensions in mm
----------------	----------------------------------	----------	------------------

Han® USB module
with screw termination

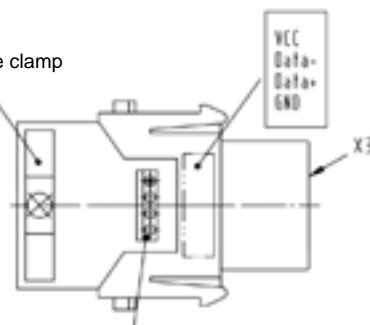


61 04 301 0538

View
termination
side



double clamp



X2
clamp 4 pins
max. 1.5 mm²

wiring plan

X2		X3
1	VCC	1
2	Data-	2
3	Data+	3
4	GND	4

Han® USB module
with screw termination
and T functionality

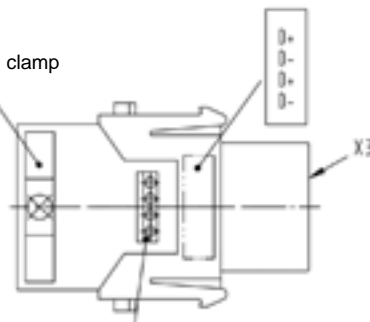


61 04 301 0573

View
termination
side



double clamp



X1
clamp 4 pins
max. 1.5 mm²

wiring plan

X1		X3
1	Data+	4
2		3
3		2
4	Data-	1

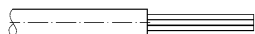
Features

- Crimp termination
- Compatible with Han® 70 A module with axial screw termination

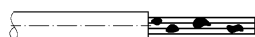
Technical characteristics

Specifications	DIN EN 60 664-1 DIN EN 61 984 EN 50 124-1
Inserts	
Number of contacts	2
Electrical data acc. to DIN EN 61 984	
Rated current	70 A
Rated voltage conductor - ground	1000 V
Rated voltage conductor - conductor	1000 V
Rated impulse voltage	8 kV
Pollution degree	3
Insulation resistance	$\geq 10^{10} \Omega$
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

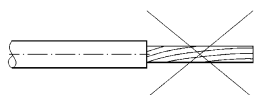
Assembly Details



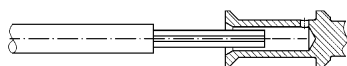
Cut the cable square and strip the insulation



The copper strands must be cleaned from dirt and oxide film



Copper strands must not be twisted



Insert the cable strand completely into the crimp ferrule.
Check insertion via inspection hole

Contacts

Power contacts	
Material	Copper alloy
Surface	
- hard-silver plated	3 μm Ag
Contact resistance	$\leq 0.5 \text{ m}\Omega$
Crimp terminal	
- mm^2	10 - 25 mm^2
Max. insulation diameter	11 mm
Stripping length	15.5 mm

Number of contacts

2

Available by September 2010



Identification	Part-Number		Drawings	Dimensions in mm
	Male insert (M)	Female insert (F)		

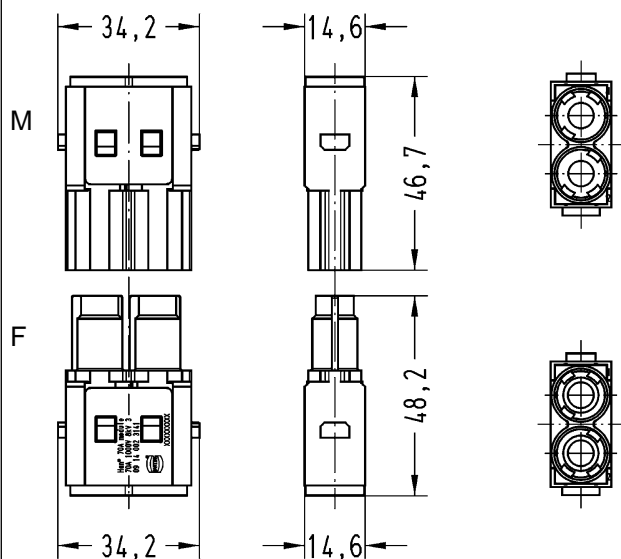
Han® 70 A module

Crimp terminal



09 14 002 3041

09 14 002 3141



Identification	Wire gauge mm ²	Part-Number		Drawings	Dimensions in mm
		Male contacts (M)	Female contacts (F)		

Crimp contacts*

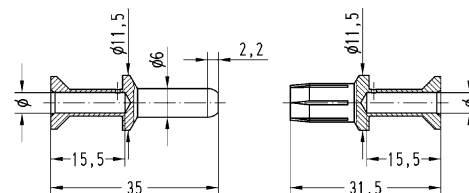
Silver plated



10
16
25

09 11 000 6131
09 11 000 6132
09 11 000 6133

09 11 000 6231
09 11 000 6232
09 11 000 6233



Wire gauge	Ø	Stripping length
10 mm ²	4.3	15.5 mm
16 mm ²	5.5	15.5 mm
25 mm ²	7.0	15.5 mm

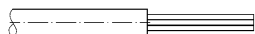
for stranded wires acc. to IEC 60 228 class 5

* Crimp zone acc. to DIN EN 46 235

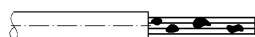
Features

- Crimp termination
- Contacts can be unlocked from the mating side
- Compatible with Han® 200 A module with axial screw termination

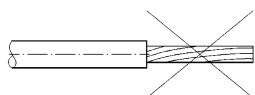
Assembly Details



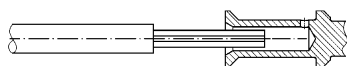
Cut the cable square and strip the insulation



The copper strands must be cleaned from dirt and oxide film



Copper strands must not be twisted



Insert the cable strand completely into the crimp ferrule.
Check insertion via inspection hole

Technical characteristics

Specifications	DIN EN 60 664-1
	DIN EN 61 984
	EN 50 124-1

Inserts

Number of contacts	1
--------------------	---

Electrical data acc. to
DIN EN 61 984

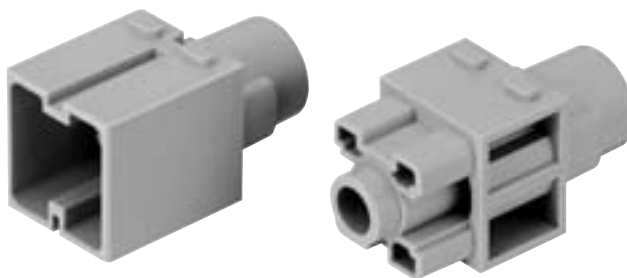
Rated current	200 A
Rated voltage conductor - ground	1000 V
Rated voltage conductor - conductor	1000 V
Rated impulse voltage	8 kV
Pollution degree	3
Insulation resistance	$\geq 10^{10} \Omega$
Material	Polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	≥ 500 mating cycles

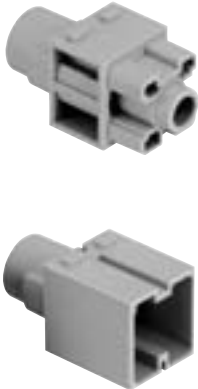
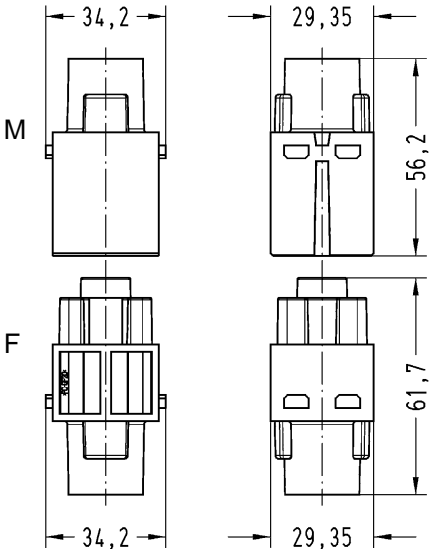
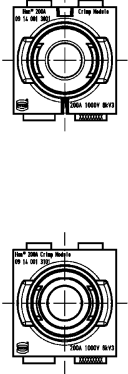
Contacts


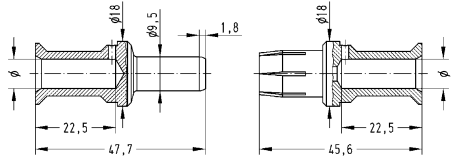
Power contacts	
Material	Copper alloy
Surface	
- hard-silver plated	3 μm Ag
Contact resistance	$\leq 0.3 \text{ m}\Omega$
Crimp terminal	
- mm^2	25 - 70 mm^2
Max. insulation diameter	18 mm
Stripping length	22.5 mm

Number of contacts

1



Identification	Part-Number		Drawings	Dimensions in mm
	Male insert (M)	Female insert (F)		
Han® 200 A module Crimp terminal 	09 14 001 3001	09 14 001 3101		Contact arrangement: view from termination side 

Identification	Wire gauge mm ²	Part-Number		Drawings	Dimensions in mm															
		Male contacts (M)	Female contacts (F)																	
Crimp contacts* Silver plated 	25 35 50 70	09 11 000 6120 09 11 000 6121 09 11 000 6122 09 11 000 6123	09 11 000 6220 09 11 000 6221 09 11 000 6222 09 11 000 6223		<table border="1"> <thead> <tr> <th>Wire gauge</th> <th>Ø</th> <th>Stripping length</th> </tr> </thead> <tbody> <tr> <td>25 mm²</td> <td>7.0</td> <td>22.5 mm</td> </tr> <tr> <td>35 mm²</td> <td>8.2</td> <td>22.5 mm</td> </tr> <tr> <td>50 mm²</td> <td>10.0</td> <td>22.5 mm</td> </tr> <tr> <td>70 mm²</td> <td>11.5</td> <td>22.5 mm</td> </tr> </tbody> </table> for stranded wires acc. to IEC 60 228 class 5	Wire gauge	Ø	Stripping length	25 mm ²	7.0	22.5 mm	35 mm ²	8.2	22.5 mm	50 mm ²	10.0	22.5 mm	70 mm ²	11.5	22.5 mm
Wire gauge	Ø	Stripping length																		
25 mm ²	7.0	22.5 mm																		
35 mm ²	8.2	22.5 mm																		
50 mm ²	10.0	22.5 mm																		
70 mm ²	11.5	22.5 mm																		

* Crimp zone acc. to DIN EN 46 235



Features

- Innovative Han-Quick Lock® termination technology
- Field assembly without special tools
- Compatible with Han® 3 A standard inserts
- Reduced wiring times
- Insert suitable for all hoods and housings using the Han® 3 A size
- Vibration resistant

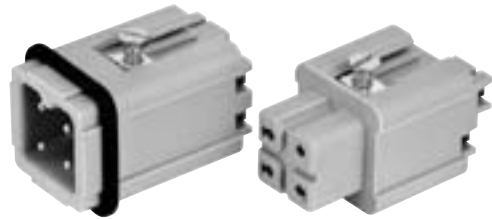
Technical characteristics

Specifications	DIN EN 60 644-1 DIN EN 61 984
Inserts	
Number of contacts	3 + PE
Electrical data acc. to DIN EN 61 984	10 A 230/400 V 4 kV 3
Rated current	10 A
Rated voltage	
- conductor - ground	230 V
- conductor - conductor	400 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	≤ 1 mΩ
Han-Quick Lock®	
- mm ²	0.5 – 2.5 mm ²
- AWG	20 – 14
Maximum insulation cross section	∅ = 3.6 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 / 67
Metal hoods/ housings	
Material	Die cast zinc alloy
Locking element	Stainless steel
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 IP 65/67 with sealing screw 09 20 000 9918

Number of contacts

3 +

Available by June 2010

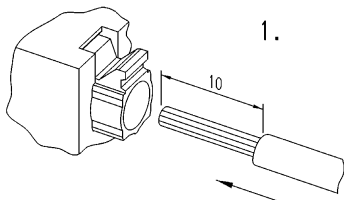


Inserts with Han-Quick Lock® Termination

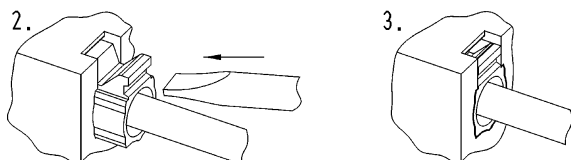
Identification	Part Number	Drawing	Dimensions in mm
<p>Han® 3 A Quick Lock male insert</p>	09 20 003 2633		
<p>Han® 3 A Quick Lock female insert</p>	09 20 003 2733		

Assembly Manual

Remove cable jacket and strip the fine stranded wires

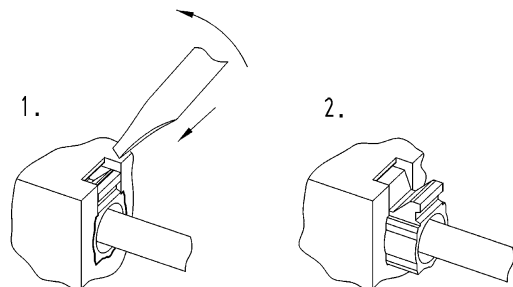


Push fine stranded wires into the Han-Quick Lock® contact and push the slide with a screw driver¹⁾ until it comes to a stop



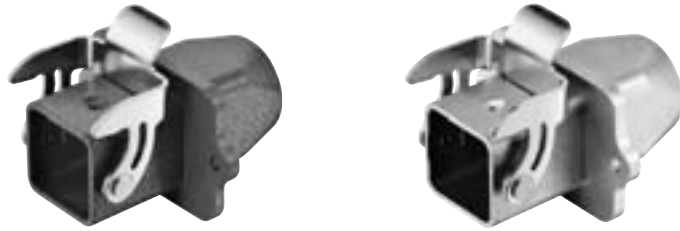
Removal Manual

Please insert the screw driver¹⁾ at an angle of 45° into the opening and lever the slide out



¹⁾ Screw driver: 0.4 x 2.5 mm

Available by August 2010



Features

- Allows assembly from both sides within the cabinet
- Excellent electro magnetic compatibility

Technical characteristics

Material	Zinc die-cast
Surface	standard version Powder-coated RAL 7037 (grey)
	EMC version non coated, electrically conductive
Limiting temperatures	-40 °C ... 125 °C
Degree of protection acc. to EN 60 529 in locked position	IP 44 IP 65/67 with use of sealing screw 09 20 000 9918
Seal	NBR

Identification

Part Number

M

Drawing

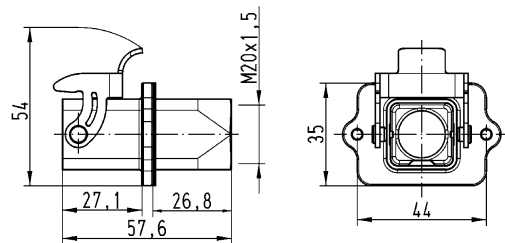
Dimensions in mm

Cable to cable housing



19 20 003 1120

M20

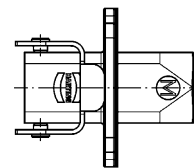


Cable to cable housing for higher EMC requirements

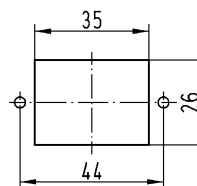


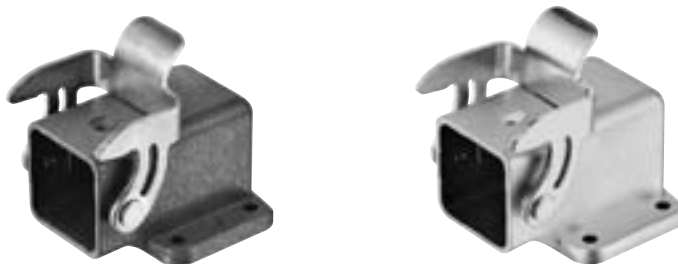
19 62 003 1120

M20



Panel cut out





Features

- Fixing with 4 screws for maximum security
- Large cabling space
- Excellent electro magnetic compatibility

Technical characteristics

Material	Zinc die-cast
Surface	standard version: Powder-coated RAL 7037 (grey) EMC version: non coated, electrically conductive
Limiting temperatures	-40 °C ... 125 °C
Degree of protection acc. to EN 60 529 in locked position	IP 44 IP 65/67 with use of sealing screw 09 20 000 9918
Seal	NBR

Identification

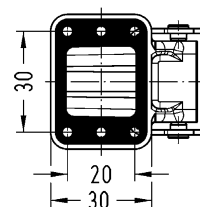
Part Number

Drawing

Dimensions in mm

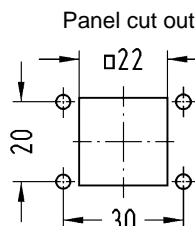
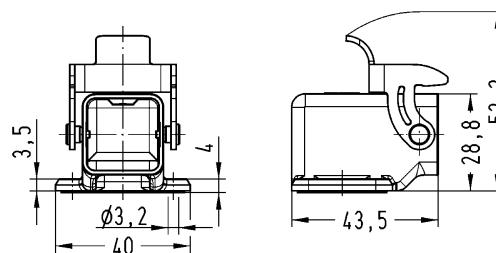
Angled bulkhead mounted housing

09 20 003 0810



Angled bulkhead mounted housing for higher EMC requirements

09 62 003 0810



Available by April 2010



Angled bulkhead mounted housing, long construction

Features

- Long construction, therefore large cabling space
- Also suitable for Han-Quintax® inserts
- Suitable for extreme environmental conditions
- Highly EMC resistant
- For interfaces, that have to be protected and shielded

Technical characteristics

Material	Zinc die-cast
Surface:	Powder-coated RAL 9005 (black)
	RoHS conform
	Black chromate not RoHS conform
Tightening torque for Fixing screws (M4)	min. 1 Nm
Limiting temperatures	-40 °C ... 125 °C
Degree of protection acc. to EN 60 529 in locked position	IP 68

Identification

Part-Number

Drawing

Dimensions in mm

Angled bulkhead mounted housing, long construction

With open bottom and feed through hole for fixing screws

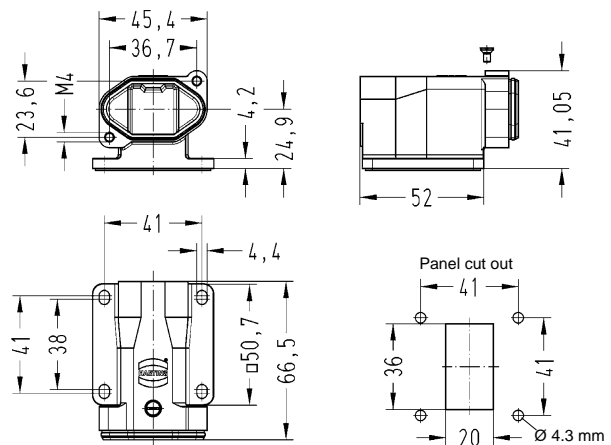


black chromate

09 40 003 0951

powder-coated

09 40 703 0951



With open bottom and tapped blind hole for fixing screws

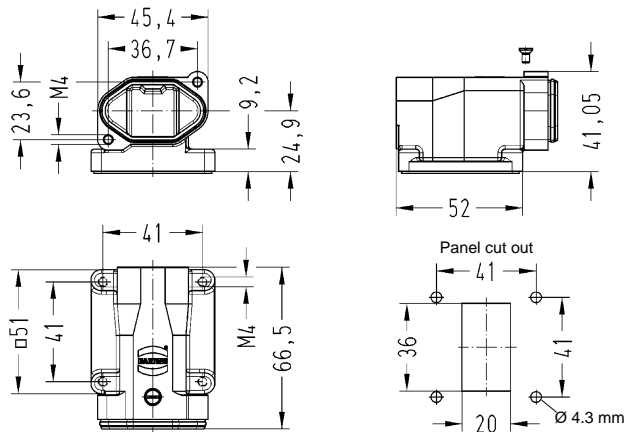


black chromate

09 40 003 0953

powder-coated

09 40 703 0953



Available by April 2010



Surface mounted housing
with top entry, long construction

Features

- Long construction, therefore large cabling space
- Also suitable for Han-Quintax® inserts
- M25 cable entry
- Suitable for extreme environmental conditions
- Highly EMC resistant
- For interfaces, that have to be protected and shielded

Technical characteristics

Material	Zinc die-cast
Surface:	Powder-coated RAL 9005 (black)
	RoHS conform
	Black chromate not RoHS conform
Tightening torque for Fixing screws (M4)	min. 1 Nm
Limiting temperatures	-40 °C ... 125 °C
Degree of protection acc. to EN 60 529 in locked position	IP 68

Identification	Part-Number	M	Drawing	Dimensions in mm
----------------	-------------	---	---------	------------------

Surface mounted housing
with top entry
long construction

With closed bottom
and feed through hole
for fixing screws



black chromate

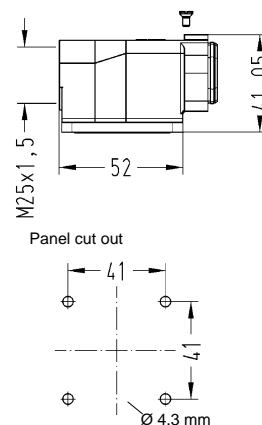
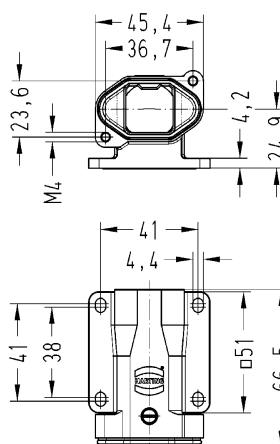
19 40 003 0951

25

powder-coated

19 40 703 0951

25



With closed bottom
and tapped blind hole
for fixing screws



black chromate

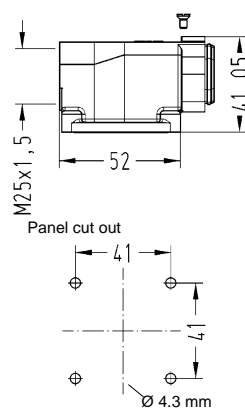
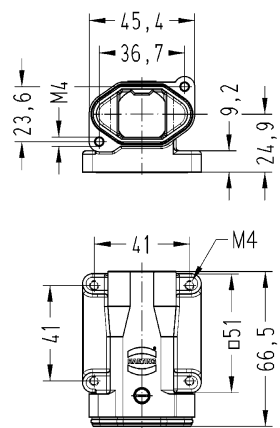
19 40 003 0953

25


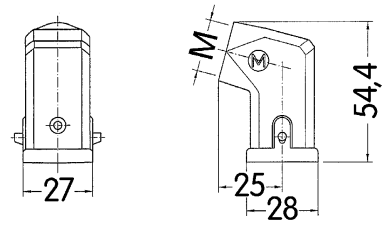

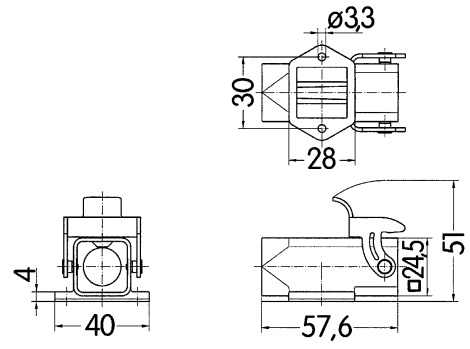

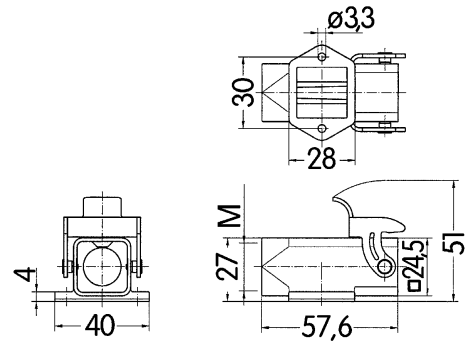


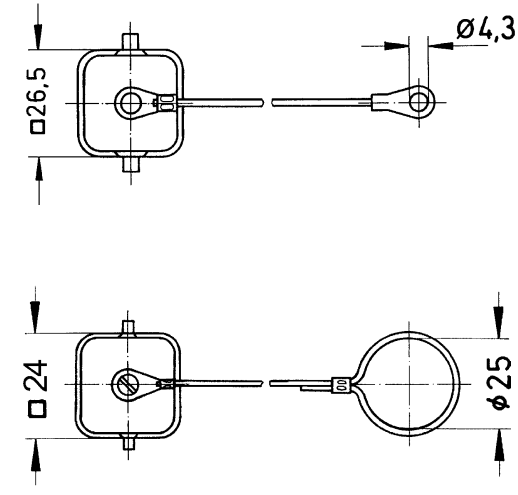
powder-coated

19 40 703 0953

25



Available by July 2010

Identification	Part-Number	M	Drawing	Dimensions in mm
<p>Hood</p> <p>side entry with glued seal</p> 	<p>19 44 003 1640 19 44 003 1643</p>	<p>20 20</p>		
<p>Bulkhead mounted housing</p> 	<p>19 44 003 0801</p>	<p>—</p>	 <p>Panel cut out 22 x 22 mm</p>	
<p>Surface mounted housing</p> <p>side entry</p> 	<p>19 44 003 1250</p>	<p>20</p>		
<p>Cover</p> <p>for housings</p>  <p>Cover</p> <p>for hoods</p> 	<p>19 44 003 5426²⁾ 19 44 003 5425¹⁾</p> <p>19 44 003 5422²⁾ 19 44 003 5421¹⁾</p>	<p>— — — —</p>		

²⁾ for mounted female insert, ¹⁾ for mounted male insert



Stainless steel hoods and housings

Features

- Hoods and housings as well as locking elements out of stainless steel
- Resistant against aggressive detergents
- Fields of application
 - Food and beverage industry
 - Water and sewage industry
 - Pharmaceutical industry
 - Chemical industry
 - Offshore and shipbuilding
- Suitable for all standard inserts that fit into size Han® 3 A

Technical characteristics

Material	Stainless steel
Seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Protection degree acc. to DIN EN 60 529 in locked position	IP 44 IP 65 / IP 67 with use of sealing screw 09 20 000 9918
Locking lever	Stainless steel

Identification

Part-Number

M

Drawing

Dimensions in mm

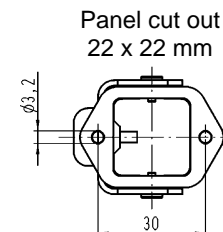
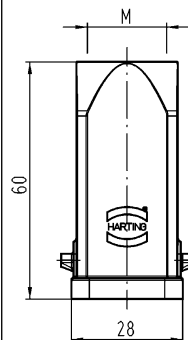
Hood

top entry
with glued seal



19 44 003 1440
19 44 003 1443

20
20



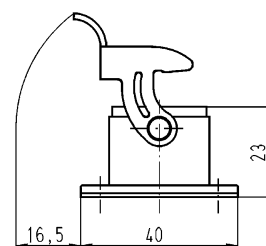
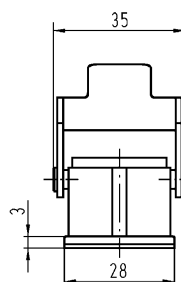
Bulkhead mounted housing

with 1 metal locking lever



19 44 003 0301

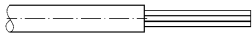
—



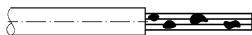
Features

- Crimp termination
- Designed for thick cable insulations
- For crimp dies acc. to DIN 46 235
- For crimping tools with 13 t pressing force

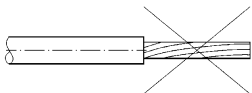
Assembly Details



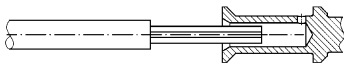
Cut the cable square and strip the insulation



The copper strands must be cleaned from dirt and oxide film



Copper strands must not be twisted



Insert the cable strand completely into the crimp ferrule.
Check insertion via inspection hole

Technical characteristics

Specifications	DIN EN 60 664-1
	DIN EN 61 984
	EN 50 124-1

Inserts

Electrical data acc. to
DIN EN 61 984

Rated current	250 A
Rated voltage	2000 V
Rated impulse voltage	12 kV
Pollution degree	3
Insulation resistance	$\geq 10^{10} \Omega$
Material	PC
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	$\leq 0.3 \text{ m}\Omega$
Crimp terminal	
- mm ²	35 - 70 mm ²
Max. insulation diameter	18 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 06 on.

Available by August 2010



Identification	Part-Number		Drawings	Dimensions in mm
	Male insert (M)	Female insert (F)		

Han® HC Modular 250 Crimp terminal 	09 11 001 3021		M 	
		09 11 001 3121		

Identification	Wire gauge mm ²	Part-Number		Drawings	Dimensions in mm
		Male contacts (M)	Female contacts (F)		

Crimp contacts* Silver plated 	35 ¹⁾	09 11 000 6127	09 11 000 6227		
	50 ²⁾	09 11 000 6128	09 11 000 6228		
Frames for 24 HPR hoods/housings 	70 ³⁾	09 11 000 6129	09 11 000 6229		
		09 11 000 9925	09 11 000 9926		

Wire gauge	Tool identification	Stripping length
35 mm ²	12	22 mm
50 mm ²	14	22 mm
70 mm ²	16	22 mm

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

Tools		09 11 000 9925	09 11 000 9926	
-------	--	----------------	----------------	--

* Crimp zone acc. to DIN EN 46 235

Features

- 6 IDC's + PE for 4.0 mm² to 6.0 mm² wires
- No interruption of the energy supply
- Space-saving and compact design
- Leading protective ground within the insert
- Assembly with standard tools
- 24 V power supply integrated
- Secondary connection 2 x M12

Assembly Details

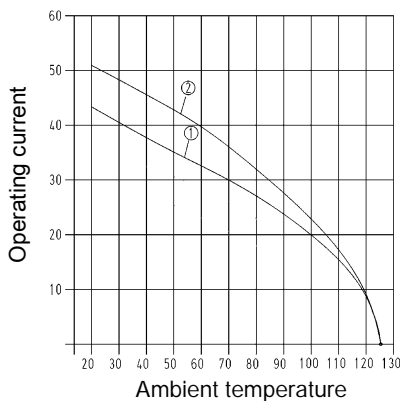
The Han-Power® S connector is suitable for the assembly of serial power bus. Having assembled the energy supply Han-Power® S can be inserted at any place of the power cable. The cable mantle has to be removed, the conductor is placed without interruption in the IDC.

Han-Power® S is suitable for cables with single strands manufactured acc. to DIN VDE 0281/ DIN EN 60 228 with wire gauges of 4.0 mm² up to 6 mm². For the distribution of the device Han-Compact® hoods or cable to cable housings are used. This power supply can be used with Han-Compact® hood.

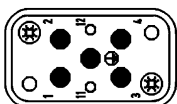
Current carrying capacity

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

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



- ① Han® Q 4/2 Wire gauge: 4 mm²
- ② Han® Q 4/2 Wire gauge: 6 mm²



Han® Q 4/2 fully loaded with wire gauge 4 x 6 mm²

Technical characteristics

Specifications	DIN EN 61 984 DIN EN 60 664-1
Han-Power® S	
Number of contacts	
- Power contacts	4 + PE
- Signal contacts	2
Electrical data acc. to EN 61 984	
<u>Power side</u>	40 A 400/690 V 6 kV 3
Rated current	40 A
Rated voltage conductor - ground	400 V
Rated voltage conductor - conductor	690 V
Rated impulse voltage	6 kV
Pollution degree	3
<u>Signal side</u>	
	10 A 250 V 4 kV 3
Rated current	10 A
Rated voltage	250 V
Rated impulse voltage	4 kV
Pollution degree	3
Rated voltage acc. to UL/CSA	
	600 / 250 V
Insulation resistance	≥ 10 ¹⁰ kΩ
Material	polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	
- mating cycles	≥ 500
Degree of protection acc. to DIN EN 60 529	IP 65
Cables	
Design of conductor acc. to	DIN VDE 0281 DIN EN 60 228
Wire gauge	4 mm ²
- Number of single strands	56 x 0.3 mm Ø
- Outer diameter	4.2 mm
Wire gauge	6 mm ²
- Number of single strands	84 x 0.3 mm Ø
- Outer diameter	4.8 mm
Technical data power supply	
Input data	90 V ... 264 V AC (50 Hz / 60Hz) 100 V ... 300 V DC
Output data	24 V DC / 2 A (adjustable from 23 V ... 29 V) Pre-setting: 24.5 V ± 0,5 %
Max. operating temperature	-20°C ... 85°C
Efficiency	>86% (at 230 V AC)
Reverse voltage	max 32 V
Tide overtime for power-fail	>20 ms
Low voltage system	SELV / PELV
Additionally features	short-circuit proof open-circuit proof automatic switch off in the case of short-circuit

Green LED marks normal operating condition.



Identification

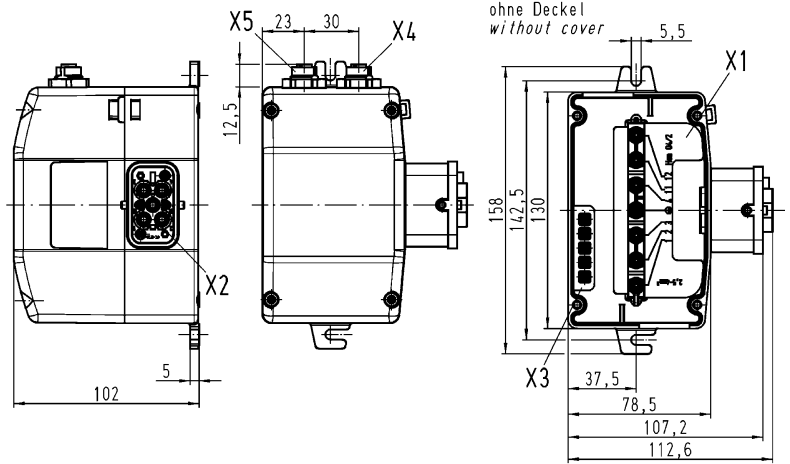
Part-Number

Drawings

Dimensions in mm

Han-Power® S
with 1 x Han® Q 4/2
with power supply 24 V

09 12 008 4610



Features

- 6 IDC's + PE for 4.0 mm² to 6.0 mm² wires
- No interruption of the energy supply
- Space-saving and compact design
- Leading protective ground within the insert
- Assembly with standard tools
- Line breakout switch

Assembly Details

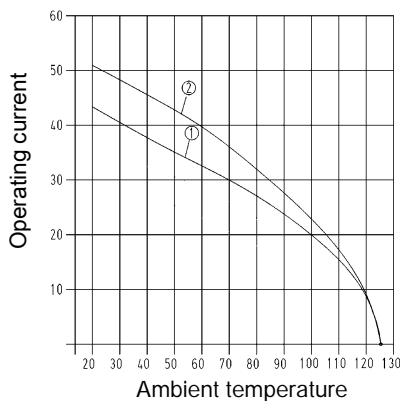
The Han-Power® S connector is suitable for the assembly of serial power bus. Having assembled the energy supply Han-Power® S can be inserted at any place along the power cable. The cable outer sheath has to be removed, the conductor is placed without interruption in the IDC.

Han-Power® S is suitable for cables with single strands manufactured acc. to DIN VDE 0281/ DIN EN 60 228 with wire gauges of 4.0 mm² to 6.0 mm². For the distribution of the device Han-Compact® hoods or cable to cable housings are used. This power supply can be used with Han-Compact® hood.

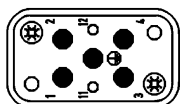
Current carrying capacity

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

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



- ① Han® Q 4/2 Wire gauge: 4 mm²
- ② Han® Q 4/2 Wire gauge: 6 mm²



Han® Q 4/2 fully loaded with wire gauge 4 x 6 mm²

Technical characteristics

Specifications	DIN EN 61 984 DIN EN 60 664-1
Han-Power® S	
Number of contacts	
- Power contacts	4 + PE
- Signal contacts	2
Electrical data	
acc. to EN 61 984	
Power side	40 A 400/690 V 6 kV 3
Rated current	40 A
Rated voltage conductor - ground	400 V
Rated voltage conductor - conductor	690 V
Rated impulse voltage	6 kV
Pollution degree	3
Signal side	10 A 250 V 4 kV 3
Rated current	10 A
Rated voltage	250 V
Rated impulse voltage	4 kV
Pollution degree	3
Rated voltage	
acc. to UL/CSA	600 / 250 V
Insulation resistance	≥ 10 ¹⁰ kΩ
Material	polycarbonate
Limiting temperatures	-40 °C ... +125 °C
Flammability acc. to UL 94	V 0
Mechanical working life	
- mating cycles	≥ 500
Degree of protection acc. to DIN EN 60 529	IP 65
Cables	
Design of conductor acc. to	DIN VDE 0281 DIN EN 60 228
Wire gauge	4 mm ²
- Number of single strands	56 x 0.3 mm Ø
- Outer diameter	4.2 mm
Wire gauge	6 mm ²
- Number of single strands	84 x 0.3 mm Ø
- Outer diameter	4.8 mm
Technical data of switches	
Max. operating temperature	-25°C ... 55°C
Mechanical life	50000 operations
Electrical life	50000 operations
Positive opening NC contact	acc. to EN60947-5-1, appendix. K
Electrical data acc. to IEC/EN 60947-5-1 (VDE 0660 sect. 200) for emergency stop switches	
Alternating current	
Utilisation category	AC15 A600
Rated insulation voltage	600 V
Rated operating voltage	240 V / 380 V
Rated operating current	3 A / 1.9 A
Direct current	
Utilisation category	DC13 Q300
Rated insulation voltage	400 V
Rated operating voltage	250 V / 125 V / 60 V / 24 V
Rated operating current	0.27 A / 0.55 A / 1 A / 2 A
Electrical data acc. to IEC/EN 61058-1 (VDE 0630 sect. 1) for switch-disconnectors	
Rated voltage	250 V~ / 400 V~
Rated current	16 (10) A / 10 (5) A

Han-Power® S 1 x Han® Q 4/2 with Maintenance Switch



Identification

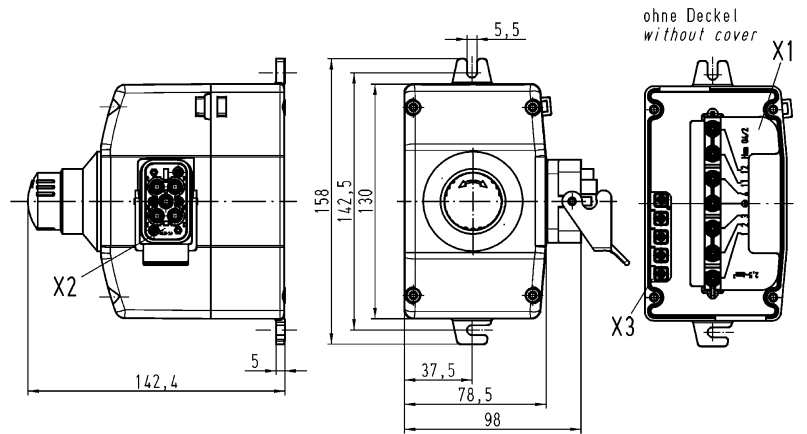
Part-Number

Drawings

Dimensions in mm

Han-Power® S
with 1 x Han® Q 4/2
with maintenance switch

09 12 008 4620

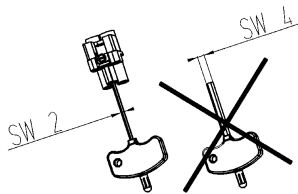


Features

- Field assembly without special tools
- Compatible with Han® Q 4/2 standard inserts with crimp terminations
- Reduced wiring times
- Inserts suitable for standard plastic and metal hoods/housings with additional PE contact from the Han-Compact® size
- Space-saving and compact design
- With or without Han-Quick Lock® signal contacts as an option

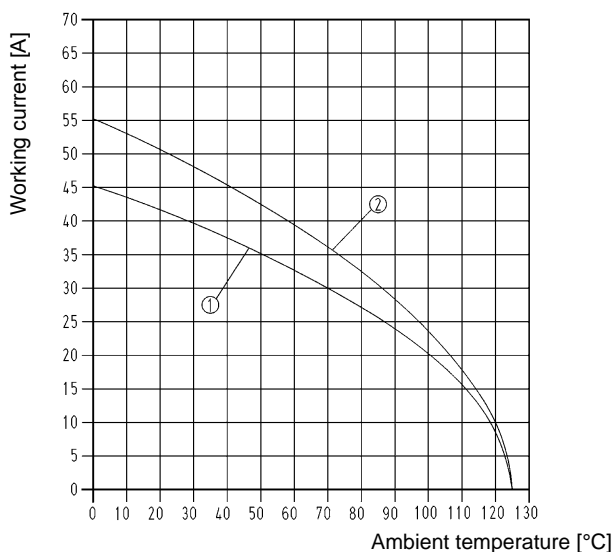
Attention

- For termination please use only hexagonal screw driver with wrench size SW 2.
- If PE contact is not used:
Please screw the PE contact maximal on both sides clockwise with a hexagonal screwdriver, wrench size SW 2.



Current Carrying Capacity

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



① Wire gauge: 4 mm²

② Wire gauge: 6 mm²

Technical characteristics

Specifications

DIN EN 60 644-1
DIN EN 61 984

Inserts

Number of contacts 4/2 + PE
Electrical data acc. to DIN EN 61 984
Power area **40 A 400/690 V 6 kV 3**
Rated current 40 A
Rated voltage conductor - ground 400 V
Rated voltage conductor - conductor 690 V
Rated impulse voltage 6 kV
Pollution degree 3

Signal area **10 A 250 V 4 kV 3**
Rated current 10 A
Rated voltage 250 V
Rated impulse voltage 4 kV
Pollution degree 3

Insulation resistance $\geq 10^{10} \Omega$
Material insert Polycarbonate
Material seal NBR
Limiting temperatures -40 °C ... +125 °C
Flammability acc. to UL 94 V 0
Mechanical working life
- mating cycles ≥ 500

Contacts

Material Copper alloy
Surface
- hard silver plated 3 μm Ag

Power contacts

Contact resistance $\leq 0.3 \text{ m}\Omega$
Axial screw termination
- mm² 4 ... 10 mm²
- AWG 12 ... 8
max. Insulation cross section 5 mm
Stripping length 8 mm⁺¹
max. Tightening torque 1.8 Nm

Signal contacts

Contact resistance $\leq 3 \text{ m}\Omega$
Han-Quick Lock®
- mm² 0.25 ... 1.5 mm²
- AWG 23 ... 16
max. Insulation cross section 3 mm
Stripping length 10 mm⁺¹

Hoods / housings

Material plastic Polycarbonate
Material metal Zinc die-cast
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

4/2 +

Available by August 2010



Inserts with axial screw termination
Signal contacts with Han-Quick Lock® termination

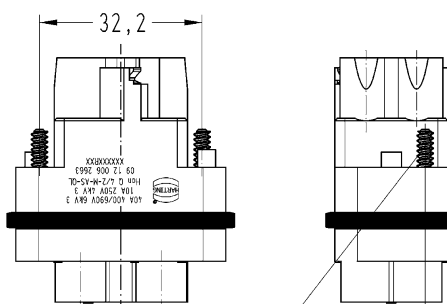
Identification Part-Number Drawing Dimensions in mm

Han® Q 4/2 Quick Lock

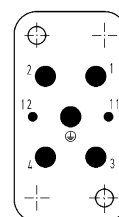
Male insert



09 12 006 2663

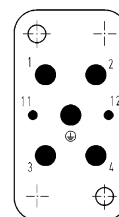
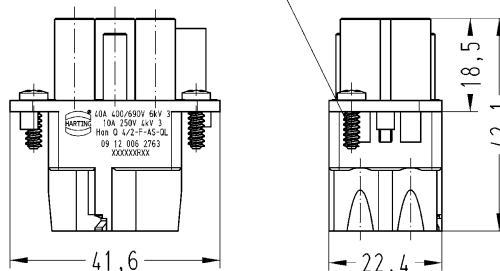


contact arrangement
view
termination side



Male insert
without Han-Quick Lock® signal
contacts

09 12 006 2666



Female insert



09 12 006 2763

Female insert
without Han-Quick Lock® signal
contacts

09 12 006 2766

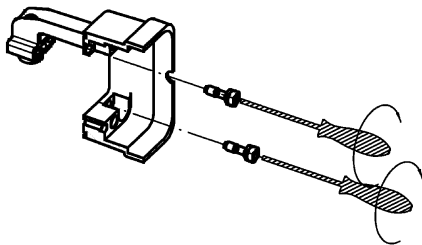
Features

- Metal hood in compact and space saving design
- High degree of flexibility due to two-part construction
- Additional and separate PE contact on the hood
- Suitable for all inserts as used in the Han-Compact® series
- Standard and EMC version

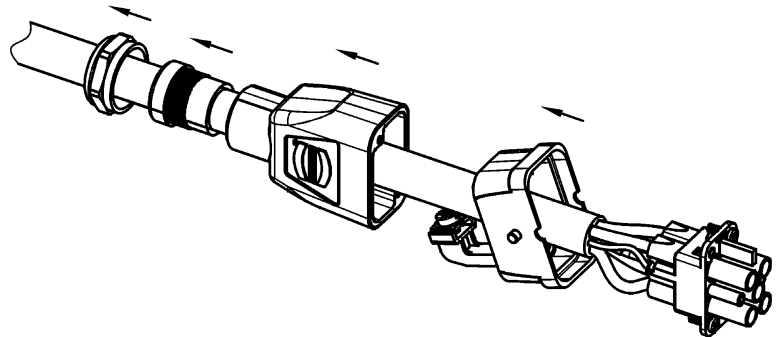
Technical characteristics

Material	Zinc die cast
Surface	black powder coated matt nickel plated black chromate
Hoods/housings seal	NBR
Limiting temperatures	-40 °C ... +125 °C
Protection degree in locked position	IP 65
Mechanical working life	≥ 500 mating cycles
Wire gauge PE conductor	10 mm ² / AWG 8
Tightening torque PE contact	1.2 Nm

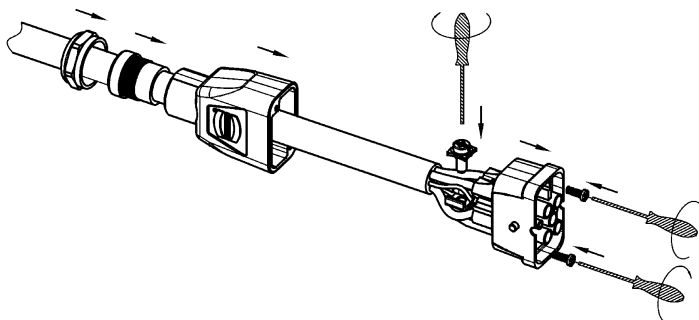
Assembly Manual



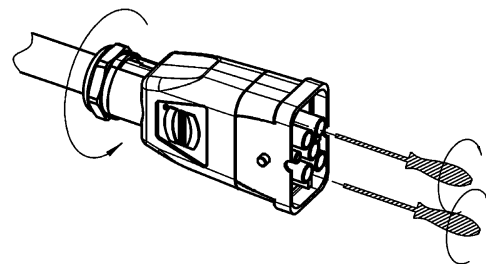
1. Pre-assemble fixing screws in the lower part



2. Push cable gland and two-part hood onto the cable, prepare the conductor and assemble the insert

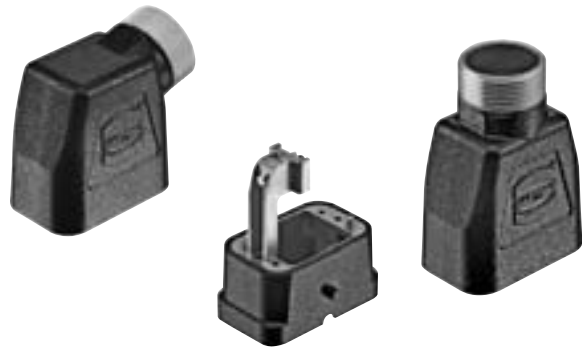


3. Connect PE conductor to the separate PE contact
Fix insert with 2 screws within the lower part of the hood
Push upper part of the hood together with the cable gland





4. Fix the two parts of the hood with the pre-assembled screws and screw the cable gland

Available by August 2010



Metal hoods in straight and angled version

Identification	Part-Number	M	Drawing	Dimensions in mm
<p>Hood side entry</p> 	<p>black powder coated 19 12 708 0511</p> <p>matt nickel plated 19 12 008 0512</p> <p>black chromate 19 12 008 0511</p>	<p>25</p> <p>25</p> <p>25</p>		
<p>Hood top entry</p> 	<p>black powder coated 19 12 708 0411</p> <p>matt nickel plated 19 12 008 0412</p> <p>black chromate 19 12 008 0411</p>	<p>25</p> <p>25</p> <p>25</p>		



Thermoplastic Protection Cover

Features

- Suitable for Han-Compact® plastic hoods and Han-Power® S with female insert

Technical characteristics

Material	Polycarbonate
Locking lever	Polyamide
Hood/housing seal	NBR
Limiting temperatures	-40 °C ... 125 °C
Protection degree acc. to DIN EN 60 529 in locked position	IP 65
Flammability acc. to UL 94	V 0

Identification

Part-Number

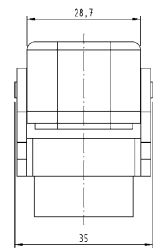
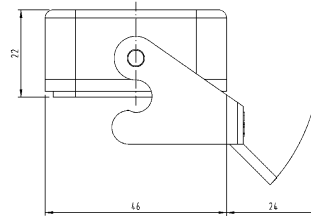
Drawing

Dimensions in mm

Protection cover for plastic hoods



61 83 401 0070





Pneumatic crimping tool

Features

- Pneumatic crimping tool for Han D[®], Han E[®] and Han[®] C contacts for wire gauges of 0.14 mm² up to 10 mm²
- Hexagonal crimp
- Easy handling with snap closing crimp dies
- Foot switch and table fixing as an option
- RoHS conforming

Technical characteristics

Specification	IEC 60 352-2
Dimensions:	280 mm x 65 mm (length x diameter)
Pneumatic pressure:	6 - 8 bar (For crimping of Han [®] C contacts 8 bar is necessary)

Identification

Part-Number

Depiction

Crimping tool CP 600
for Han D[®], Han E[®], Han[®] C

09 99 000 0810



Crimp dies 0.14 - 4 mm²
for Han D[®], Han E[®], Han[®] C

09 99 000 0813



Crimp dies 6 mm² / 10 mm²
for Han[®] C

09 99 000 0814



Foot switch
Table fixing

09 99 000 0811

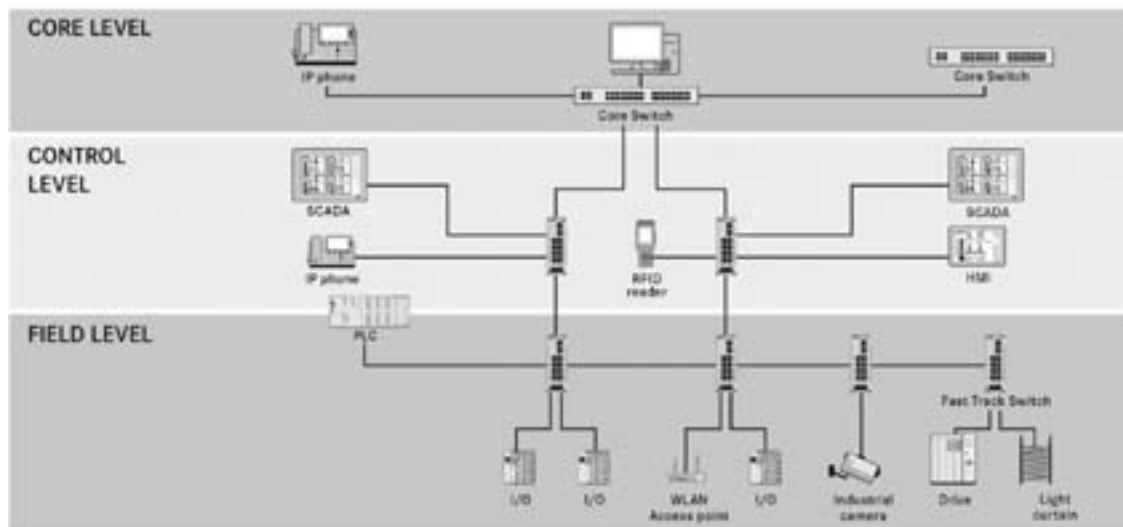
09 99 000 0812

Introduction

Fast Track Switching

Automation IT is a communication platform that serves all applications within an industrial manufacturing firm. By connecting all applications, the uniform platform network increases the efficiency of company workflows. **Automation IT** supports Standard Ethernet at all levels – including the office, management and control levels, and also in the field.

Automation IT – the platform for all applications



The currently available switching technology used in IEEE 802.3 Ethernet, however, does not offer the level of determinism required for automation applications. That is why automation solutions that only implement standard (unchanged) Ethernet require a restricted network design in order to match automation performance levels. Thus there are limited options for the network topology or segmentation – to the extent that IT communications are not allowed within the automation environment.

Automation requires for Industrial Ethernet:

- top performance
- safety
- flexible topology
- and above all determinism

Standard Ethernet switching is based on store-and-forward switching and this introduces long latency times for the frames. But even more serious is the tight dependency on the degree of network traffic: if only automation frames are present in the network, then these frames can be transmitted with no problems. But additional data traffic on the network will compete with the automation frames for forwarding and can thus delay these frames.

Standard switching uses the QoS (Quality of Service) option to influence this. If multiple frames are located in the switch queue, then the frames with the highest priority are forwarded first. But it is still possible for other data frames with priorities equal to or greater than the automation frames to be present. And even when the automation frame has the highest priority, if a data frame is in the process of being sent, the next automation frame must wait until 1522 bytes have been completely sent. Only then is the path open for the automation frame. The same delay could then happen on the next network switch once more. So these wait delays can quickly add up to times which are critical for automation applications. This behaviour can be seen as stochastically random. Most of the time the transfer times will be sufficient. But it only takes one delayed frame to trigger a problem.

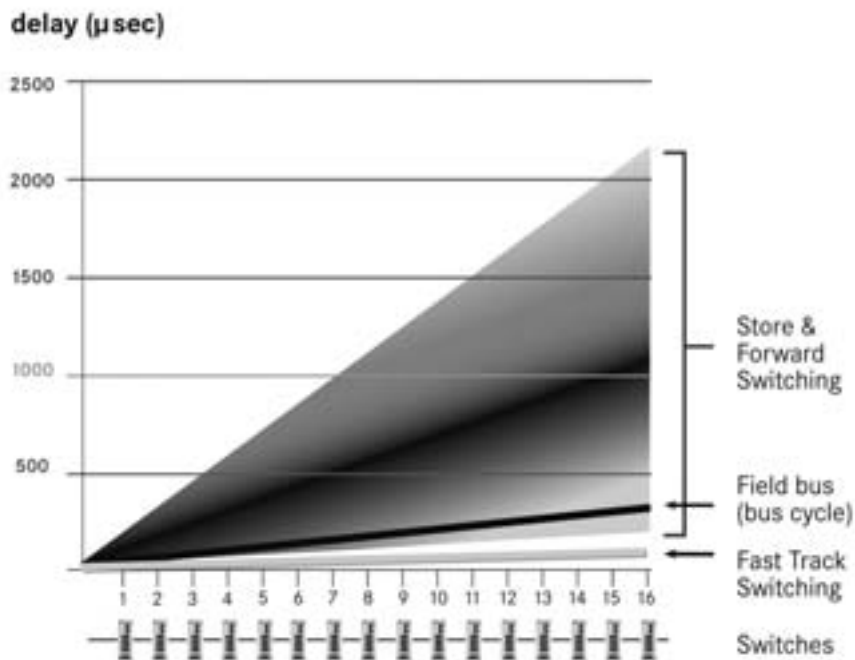
Several Ethernet-based methods have identified this problem and eliminated it. However such methods require each network node to implement specialized hardware for communication.

With the development of Fast Track Switching (FTS), HARTING has found a new path. FTS switches solve the performance and deterministic problems while all other nodes require only the standard Ethernet interfaces.

Fast Track Switching uses three key features to achieve this:

1. Preferred frames (such as automation frames) are detected first. The switch can focus on any specific part of the Ethernet header for special properties. For example, PROFINET frames are Ethertype 8892. This type is then monitored and evaluated if the application needs to accelerate their transmission.
2. These key frames get fast-track forwarding – a cut-through process instead of store-and-forwarding. As a result, the switch latency time is minimized.
3. If the switch port needed for the forwarding is busy at that moment sending a data frame, then the data frame is buffered and the forwarding is aborted so that the automation frame can be forwarded immediately. Only after the automation frame is sent is a second attempt made to send the data frame.

A simple example serves to illustrate the superior performance of this Fast Track Switching:



An automation frame must travel on a path through 16 switches. The transmission time for the Ethernet frames under standard switching rules is tightly dependent on the network load. Thus the transmission time for the frames can vary widely according to the network load: a few arrive quite quickly, the majority have an average time, and a few frames travel quite slowly.

As a reference point, a comparable cycle for one of the Field bus protocols used widely in automation applications is shown in black. This protocol has state-of-the-art levels of determinism and transfer speeds. Sometimes the data arrives just as fast at its destination when standard switching is used – but only sometimes.

Fast Track Switching, on the contrary, exhibits excellent results and is deterministic.

Now it has finally become possible to setup a universal **Automation IT** communications platform that reaches into the field level. And finally automation protocols which rely on standard unchanged Ethernet (such as PROFINET RT or EtherNet/IP) can deliver the high performance needed for automation applications.

HARTING has also integrated this groundbreaking technology into production models available for the user: The configurable FTS 3100 model offers an easy-to-configure FTS solution for users. Many switch options can be customized to fit your application – even by those who are not trained network administrators.

And with the fully managed switches from the FTS 3000 line, HARTING combines FTS technology with all of the well-known functions of modern managed industrial Ethernet Switches.



Ethernet Switch

Ha-VIS FTS 3100s-A

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

Advantages

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

General Description

The Fast Ethernet Switches of the product family Ha-VIS FTS 3000 can identify automation profiles (e.g. PROFINET, EtherNet/IP, Modbus TCP and customized profiles), accelerate their data transmission and prefer them. They are suitable for industrial applications.

The product family enables the connection of up to 10 network devices over shielded Twisted Pair. It supports Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s).

The Ethernet Switch works as an unmanaged switch and can work in Fast Track Switching mode and in Store and Forward mode. It supports Auto-crossing, Auto-negotiation and Auto-polarity.

Identification

Part number

Drawing

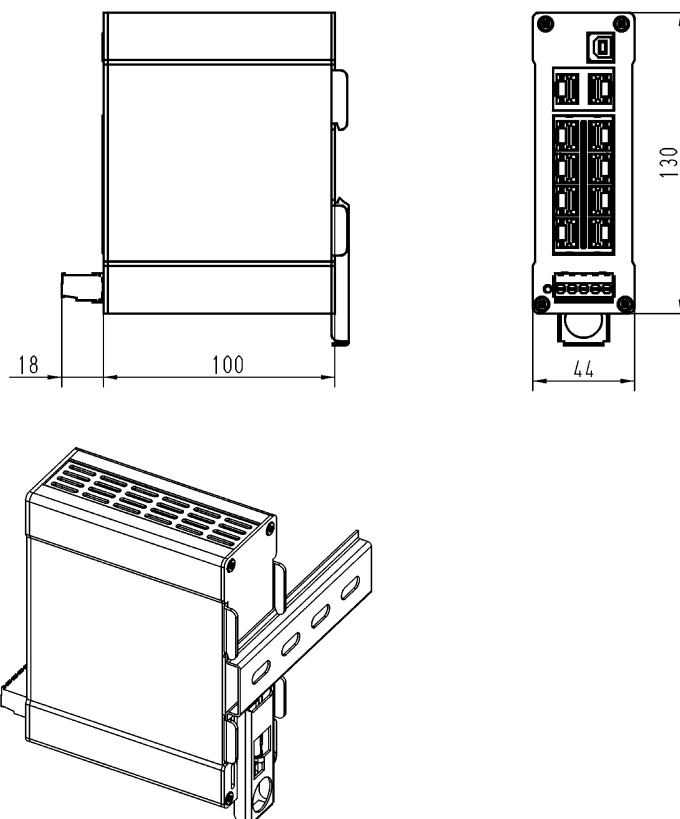
Dimensions in mm

Ha-VIS FTS 3100s-A

FTS Ethernet Switch with 10 ports RJ45

for top-hat mounting rail

20 78 110 1000



Technical characteristics

Features

- Auto-crossing
- Auto-negotiation
- Auto-polarity
- Store and Forward Switching mode
- Fast Track Switching mode

Ethernet Interface

Number of ports	• 10x 10/100Base-TX, unmanaged
Cable types acc. to IEEE 802.3	• Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	• 10/100 Mbit/s (RJ45)
Maximum cable length	• 100 m (Twisted Pair; with cable Category 5 acc. to EN 50 173-1)
Terminating method	• RJ45 (Twisted Pair)
Diagnostics (via LED)	• Status Link: Green • Status Data transfer (Act): Green flashing • Data transfer rate (Speed): 100 Mbit/s: Yellow / 10 Mbit/s: OFF
Topology	Line, Star or mixed

Parameterisation via USB

- Auto-negotiation
- 10/100 Mbit/s
- Full/Half Duplex
- Port enable/disable
- Port mirroring
- Flow Control
- FTS Port enable/disable
- Industrial Profile (PROFINET, EtherNet/IP, Modbus TCP, customized)
- NRT Bandwidth Control

Power Supply

Power supply	24 V DC
Permissible range	12 V ... 48 V
Current consumption	270 mA (at 24 V DC)
Diagnostics (via LED)	• Power supply in permissible range: Green • Undervoltage: Red
Terminating Power supply	5-pole pluggable screw contact, for redundant power supply

Design features

Material of housing	Aluminium, anodized
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN 60 529	IP 30
Mounting	• 35 mm top-hat rail acc. to EN 60 715 • Panel mounting, vertical assembly
Weight	approx. 0.5 kg

Environmental conditions

Operating temperature	0 °C ... +55 °C
Storage temperature	-40 °C ... +85 °C
Relative humidity	30 % ... 95 % (non-condensing)

Available by September 2010



Ethernet Switch Ha-VIS FTS 3100-A

10-port Ethernet Switch with Fast Track Technology managed

Advantages

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

General Description

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

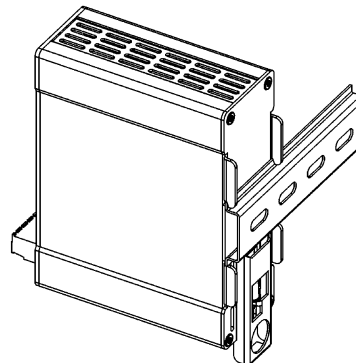
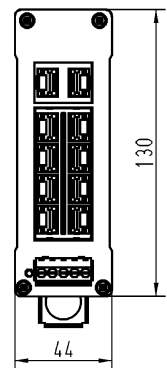
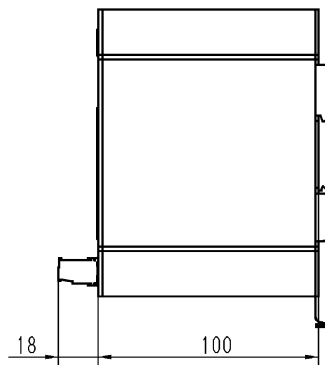
Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Ha-VIS FTS 3100-A

FTS Ethernet Switch with 10 ports RJ45

for top-hat mounting rail

20 78 110 4000



Technical characteristics

Features

- Auto-crossing
- Auto-negotiation
- Auto-polarity
- Store and Forward Switching mode
- Fast Track Switching mode

Ethernet Interface

Number of ports

Cable types acc. to IEEE 802.3

Data rate

Maximum cable length

Terminating method

Diagnostics (via LED)

- 10x 10/100Base-TX, managed
 - Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
 - 10/100 Mbit/s (RJ45)
 - 100 m (Twisted Pair; with cable Category 5 acc. to EN 50 173-1)
 - RJ45 (Twisted Pair)
 - Status Link: Green
 - Status Data transfer (Act): Green flashing
 - Data transfer rate (Speed): 100 Mbit/s: Yellow / 10 Mbit/s: OFF
- Line, Star or mixed

Topology

Basic functions

Parameterisation via USB

- 10/100 Mbit/s
- Full/Half Duplex
- Port enable/disable
- Port mirroring
- Flow Control
- Industrial Profile (PROFINET, EtherNet/IP, Modbus TCP, customized)
- NRT Bandwidth Control

Management functions

- STP, RSTP
- IGMP Snooping with support for querier
- Port Based VLANs
- Alarm via email, SNMP traps
- PROFINET diagnosis
- DHCP Option 82
- Plugable Memory Card

Power Supply

Power supply

Permissible range

Current consumption

Diagnostics (via LED)

24 V DC

12 V ... 48 V

270 mA (at 24 V DC)

- Power supply in permissible range: Green
- Undervoltage: Red

Terminating Power supply

5-pole pluggable screw contact, for redundant power supply

Design features

Material of housing

Dimensions (W x H x D)

Degree of protection

acc. to DIN 60 529

Mounting

Weight

Aluminium, anodized

44 x 130 x 100 mm (without connectors)

IP 30

- 35 mm top-hat rail acc. to EN 60 715
 - Panel mounting, vertical assembly
- approx. 0.5 kg

Environmental conditions

Operating temperature

Storage temperature

Relative humidity

0 °C ... +55 °C

-40 °C ... +85 °C

30 % ... 95 % (non-condensing)



**Ethernet Switch
Ha-VIS eCon 4000**

Ethernet Switches, unmanaged,
for flat wall mounting

General Description

The Fast Ethernet Switches of the product family Ha-VIS 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 robust M12 interface shows its advantages especially in applications at risk of vibrations.

The Ha-VIS eCon 4000 Ethernet Switch product family, with its integrated LEDs, supports fast and easy network diagnosis. The Ha-VIS 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)	<ul style="list-style-type: none"> • Status Link – ON • Data transfer (Act) – flashing • Data transfer rate (Speed) – 100 Mbit/s: Yellow / 10 Mbit/s: Green
PoE (per port)	<ul style="list-style-type: none"> • no PoE device – OFF • PoE device connected – Green • PoE device with failure – Red
Topology	Line, Star or mixed

Power supply

Input voltage Ha-VIS eCon 4080-BPoE1 mode PoE	48 V DC (46 ... 55 V DC)						
mode non PoE	24 / 48 V DC (12 ... 55 V DC)						
Termination	M12 A-coding, male, for redundant power supply						
Diagnostics (via LED)	<table> <tr> <td>Pwr X9 (switch)</td> <td>Pwr PoE (mode PoE)</td> </tr> <tr> <td>Power supply – Green</td> <td>> 46 V DC – Green</td> </tr> <tr> <td></td> <td>< 46 V DC – Red</td> </tr> </table>	Pwr X9 (switch)	Pwr PoE (mode PoE)	Power supply – Green	> 46 V DC – Green		< 46 V DC – Red
Pwr X9 (switch)	Pwr PoE (mode PoE)						
Power supply – Green	> 46 V DC – Green						
	< 46 V DC – Red						

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 60529	IP 40 / IP 30 (Ha-VIS 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
Ha-VIS eCon 4080-BPoE1
 8-port PoE Ethernet Switch for flat installation

Unmanaged	IP 30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input type="checkbox"/>
-----------	-------	---	---

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
 Permissible range (min/max) 46 V ... 55 V DC
 Input current max. 3.0 A (at 48 V DC, load 350 mA per port)

Mode Non-PoE

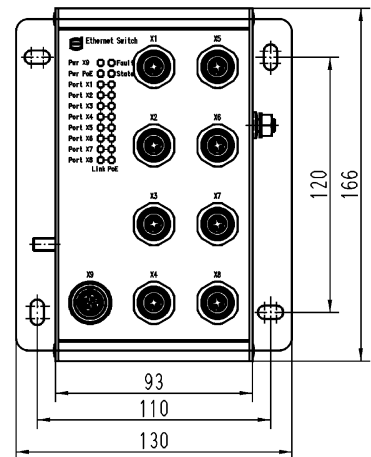
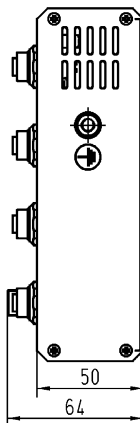
Input voltage / Termination 24 / 48 V DC / M12 A-coding, male, for redundant power supply
 Permissible range (min/max) 12 V ... 55 V DC
 Input current approx. 150 mA (at 24 V DC)

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
----------------	-------------	---------	------------------




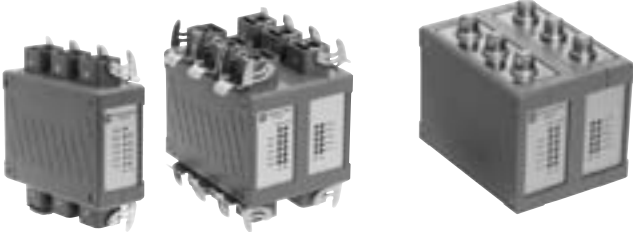
Ha-VIS eCon 4080-BPoE1
 PoE Ethernet Switch
 with 8 ports M12 D-coding
 for wall mounting

20 77 208 3009



Overview

The following management functions are available for these managed Ethernet Switches from HARTING:

Family	Type	Part number
Ha-VIS mCon 3000 	Ha-VIS mCon 3100-AV	20 76 110 4002
	Ha-VIS mCon 3100-AAV	20 76 110 4003
	Ha-VIS mCon 3061-ADV	20 76 107 4101
	Ha-VIS mCon 3063-ADV	20 76 109 4101
	Ha-VIS mCon 3082-ADV	20 76 110 4101
	Ha-VIS mCon 3061-AEV	20 76 107 4201
	Ha-VIS mCon 3063-AEV	20 76 109 4201
	Ha-VIS mCon 3082-AEV	20 76 110 4201
	Ha-VIS mCon 3082-AFV	20 76 110 4102
Ha-VIS mCon 4000 	Ha-VIS mCon 4080-B1V	20 77 208 4001
	Ha-VIS mCon 4080-B3V	20 77 208 4003
Ha-VIS mCon 9000 	Ha-VIS mCon 9100-AAV	20 76 110 7002
	Ha-VIS mCon 9082-ADV	20 76 110 7101
	Ha-VIS mCon 9082-AEV	20 76 110 7201
	Ha-VIS mCon 9070-BV	20 76 207 7002
	Ha-VIS mCon 9080-BV	20 76 208 7002
Ha-VIS mCon 7000 	Ha-VIS mCon 7050-A1V	20 70 305 4923
	Ha-VIS mCon 7050-B1V	20 70 305 4943
	Ha-VIS mCon 7100-A1V	20 70 310 4925
	Ha-VIS mCon 7100-B1V	20 70 310 4945
	Ha-VIS mCon 7100-AAV	20 70 310 4924

Please find descriptions and technical details for these Ethernet Switches in the HARTING catalogue „Ethernet Network Solutions Automation IT“.

NOTE:

The Ethernet Switch family Ha-VIS mCon 1000 includes management functions, which are partially different from the above-mentioned table.

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
	Differentiated services (DiffServ)	RFC 2474

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

	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 Ha-VIS mCon xxxx-..V

Exclusion: All Ethernet Switches of the family Ha-VIS mCon 1000.

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



General Description

Features

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

The Ha-VIS 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.

- 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

Application fields

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

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

Technical characteristics

Ethernet interface RJ45

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 (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)	<ul style="list-style-type: none"> • Status Link – Green • Data transfer (Act) – Green flashing • Data transfer rate (Speed) – 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 60529	IP 30
Mounting	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60715 • Panel mounting, vertical assembly
Weight	approx. 0.6 kg

Environmental conditions

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

Technical characteristics - F.O. termination

Ethernet interface – F.O.

Number of ports	2x 100Base-FX
Cable types according to IEEE 802.3	Singlemode fibre, 1300 nm; 9 µm
Data rate	100 Mbit/s
Maximum cable length	15 km
Termination	SC-D female
Diagnostics (via LED)	<ul style="list-style-type: none"> • Status Link – Green • Data transfer (Act) – Green flashing
Wavelength	1300 nm
Transceive power T(X) max. (dynamic)	• -14 dBm
Transmission power T(X) min.	• -23.5 dBm
Receive power RX typical (dynamic)	<ul style="list-style-type: none"> • -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



Ethernet Switch Ha-VIS mCon 3082-AFV

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

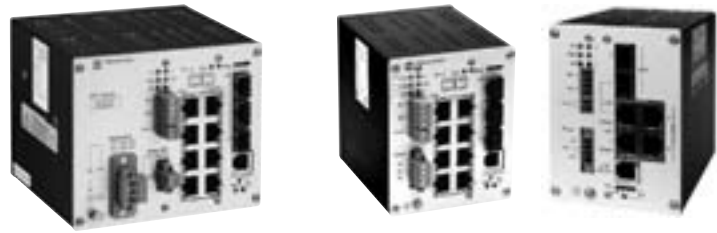
Managed	IP 30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
---------	-------	---	--

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. 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	-10 °C ... +70 °C
Approvals	cUL (in preparation)
Management	fully Managed via Web interface and SNMP Functions see page 79

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3082-AFV Ethernet Switch, managed 8 RJ45 ports 2 SC ports including Set for assembly on standard rail	20 76 110 4102		

Ethernet Switch Ha-VIS mCon 1000

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



General Description

Supporting Ethernet (10 Mbit/s), Fast Ethernet (100 Mbit/s) and Gigabit Ethernet (1000 Mbit/s), HARTING's manageable Fast Ethernet Switch product family Ha-VIS mCon 1000 is suitable for use in industrial environments.

The product family Ha-VIS mCon 1000 is particularly well suited for communications networks in power distribution stations, wind turbine facilities, or similar applications.

Selected Ethernet Switches of this product family conform to the demands of the IEC 61 850-3.

Up to 10 Ethernet stations can be connected to the Ethernet Switches via shielded twisted-pair cable and fibre-optical cables.

The protection class, temperature range and mechanical stability ensure a high level of operational security and suitability for the most demanding industrial requirements.

Features

- Protocol-transparent transmission
- Store-and-forward switching mode, self-learning
- Automatic back-pressure flow control in half-duplex mode (HDX)
- Flow Control according to IEEE 802.3x in full-duplex mode (FDX)
- High performance non-blocking switching fabric
- Ring, star and line topologies, can be implemented in any way

Advantages

- Robust metal housing
- EMC, temperature range and mechanical stability meet the highest demands
- Management functions are integrated

Application fields

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

Technical characteristics

Ethernet interface RJ45

Number of ports

Ha-VIS mCon 1042 3x 10/100/1000Base-T(X)
1x 10/100/1000Base-T(X) (port 1 - combo port with SFP-Port 1)

Ha-VIS mCon 1083 7x 10/100Base-T(X)
1x 10/100/1000Base-T(X) (port 1 - combo port with SFP-Port 1)

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 Cat. 5 cable acc. to DIN EN 50 173-1)

Termination RJ45 (Twisted Pair)

Diagnostics (via LED)

- Status Link active: Green
Data transfer (Act): Green flashing
- Transmission mode (FDX) Full duplex: Yellow
Half duplex: Yellow flashing
- Management (State) active: Green

Topology Ring, Line, Star or mixed

Ethernet interface – F.O.

Number of ports

Ha-VIS mCon 1042 2x for SFP modules

Ha-VIS mCon 1083 3x for SFP modules

Data rate 100 Mbit/s or 1000 Mbit/s

Ha-VIS mCon 1042 1 port 100 Mbit/s or 1000 Mbit/s
(port 1* - combo port with RJ45 port 1)
1 port 1000 Mbit/s

Ha-VIS mCon 1083 1 port 100 Mbit/s or 1000 Mbit/s
(port 1* - combo port with RJ45 port 1)
2 ports 1000 Mbit/s

Termination SFP module (see catalogue „HARTING Ethernet Network Solutions Automation IT“)

Diagnostics (via LED)

- Status Link – Green
- Data transfer (Act) – Green flashing

Topology Ring, Line, Star or mixed

Alarm signalling contact

2 change-over contacts, potential-free, 30 V DC / 1 A
4-pole pluggable screw contact

Diagnostics (via LED)

- Alarm signalling contact M1 active: Red
- Alarm signalling contact M2 active: Red

Technical characteristics

Design features

Housing material	Metal (coated)
Dimensions (W x H x D)	
Ha-VIS mCon 1042-AASFP	75 x 105 x 106 mm (without connectors)
Ha-VIS mCon 1083-ASFP-PoE	85 x 105 x 106 mm (without connectors)
Ha-VIS mCon 1083-ASFP4	126 x 105 x 106 mm (without connectors)
Degree of protection acc. to DIN 60529	IP 30
Mounting	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60715 • Panel mounting, vertical assembly
Weight	
Ha-VIS mCon 1042-AASFP	approx. 0.7 kg
Ha-VIS mCon 1083-ASFP-PoE	approx. 0.8 kg
Ha-VIS mCon 1083-ASFP4	approx. 1.25 kg
Environmental conditions	
Operating temperature	-40 °C ... +70 °C -25 °C ... +70 °C (Ha-VIS mCon 1042 AASFP only)
Storage temperature	-40 °C ... +85 °C
Relative humidity	20 % ... 90 % (non-condensing)

Management functions

Basic functions

- Store and Forward Switching Mode (IEEE 802.3)
- Multicast filtering and bandwidth limiting
- IGMP Snooping and Querier (IEEE 802.1)
- VLAN (IEEE 802.1Q)
- Spanning Tree Protocol (STP) (IEEE 802.1D)
- Rapid Spanning Tree (RSTP) (IEEE 802.1W)
- QoS (IEEE 802.1P)
- DHCP Client, BootP
- Port based Network Access control (IEEE 802.1x)
- RADIUS
- LLDP (IEEE 802.1AB)
- CDP (Cisco Discovery Protocol)

SNMP

- SNMP V1 and SNMP V2
- Enterprise (HARTING MIB)
- MIB II
 - RMON (statistics, history, alarm, events)
 - Dot1Bridge
 - DHCP Options
 - ICMP
 - IP
 - TCP
 - UDP
 - SNMP

Web-based access (password protection)

- Status overview
- Port settings
- Network configuration
- Password settings
- Alarm settings
- Diagnostics

Additional services

- SYSLOG
- Parameter and firmware import and export via TFTP
- System time via SNTP

Diagnostics

- LEDs for Power, Link, Status, Data transmission and Fault
- Port diagnostic
- Port mirroring
- History
- Alarms via SYSLOG and SNMP Traps
- Cable diagnostic for all RJ45 ports
- SFP diagnostic
- Temperature monitoring

Additional information about Management functions and Firmware updates can be found on our Web server.

Ethernet Switch Ha-VIS mCon 1042-AASFP

6-port Ethernet Switch for mounting onto top-hat mounting rail
in control cabinets including 2 ports for SFP modules



Managed	IP 30	PROFINET compatible <input type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
---------	-------	--	--

Number of ports, Copper / Termination	4x 10/100/1000Base-T(X) / RJ45 (Twisted Pair) (3x 10/100/1000Base-T(X), if both SFP ports are used)
Number of ports, F.O. / Termination	2x plug-in slot for SFP modules / SFP module
Number of ports, V.24 / Termination	1x V.24 / RS 232 (interface for Telnet)
Input voltage / Termination	24 / 48 V DC / 4-pole screw terminal, pluggable redundant power supply
Permissible range (min/max)	21 V ... 57 V DC
Input current	approx. 350 mA (at 24 V DC)
Diagnostics (via LED)	<ul style="list-style-type: none"> • Power supply S1 present Green • Power supply S2 present Green • Operating state (Run) Green
Alarm signalling contact	2 change-over contacts, potential-free, 30 V DC / 1 A 4-pole pluggable screw contact
Function contact	2-pole pluggable screw contact An openend/closed function contact will activate the operation sequence as configured in the management.
Housing material	Metal (coated)
Dimensions (W x H x D)	75 x 105 x 106 mm (without connectors)
Weight	approx. 0.7 kg
Operating temperature	-25 °C ... +70 °C
Management	fully Managed via Web interface, SNMP, Telnet and V.24 (RS 232) Functions see page 88

Identification

Part number

Drawing

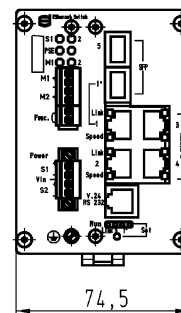
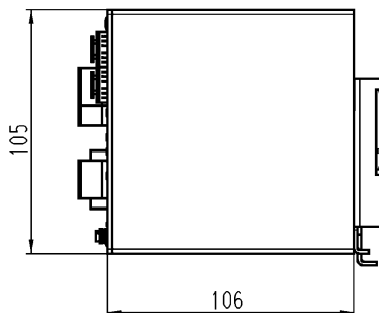
Dimensions in mm

Ha-VIS mCon 1042-AASFP

Ethernet Switch, managed, with
 4 ports RJ45
 2 ports SFP
 1 port V.24 (RS 232)

including
 Set for assembly on standard rail

20 76 106 6303



Ethernet Switch Ha-VIS mCon 1083-ASFP-PoE

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets; including 3 ports for SFP modules
IEC 61 850-3 compliant



Managed	IP 30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	7x 10/100Base-T(X) 1x 10/100/1000Base-T(X) (port 1 - combo port with SFP port 1)		
Number of other ports	3x plug-in slot for SFP modules / SFP module		
Power supply	<i>Standard</i>		
Input voltage / Termination	24 V DC / 4-pole screw terminal, pluggable redundant power supply		
Permissible range (min/max)	21 V ... 57 V DC		
Input current	approx. 470 mA (at 24 V DC)		
PoE			
Input voltage / Termination	48 V DC / 4-pole screw terminal, pluggable		
Permissible range (min/max)	44 ... 57 V DC		
Output current	approx. 1800 mA (at 48 V DC)		
Output voltage	48 V DC (46 ... 57 V DC)		
Output power	15.4 W per port (1 ... 4)		
Output current	0.35 A		
Type	Mode A		
Diagnostics (via LED)	<ul style="list-style-type: none"> • Power supply S1 present Green • Power supply S2 present Green • Operating state (Run) Green • PoE power supply present: PSE Green • PD power supply present: PD Green 		
Alarm signalling contact	2 change-over contacts, potential-free, 30 V DC / 1 A 4-pole pluggable screw contact		
Housing material	Metal (coated)		
Dimensions (W x H x D)	85 x 105 x 106 mm (without connectors)		
Weight	approx. 0.8 kg		
Operating temperature	-40 °C ... +70 °C		
Management	fully Managed via Web interface, SNMP, Telnet and V.24 (RS 232) Functions see page 88		

Identification

Part number

Drawing

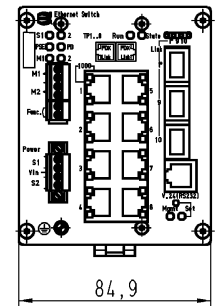
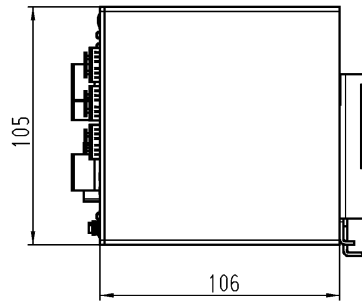
Dimensions in mm

Ha-VIS mCon 1083-ASFP-PoE

Ethernet Switch, managed, with
8 ports RJ45
3 ports for SFP modules

including
Set for assembly on standard rail

20 76 111 6303



Ethernet Switch Ha-VIS mCon 1083-ASFP4

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets; including 3 ports for SFP modules



Managed	IP 30	PROFINET compatible <input type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	7x 10/100Base-T(X) 1x 10/100/1000Base-T(X) (port 1 - combo port with SFP port 1)		
Number of other ports	3x plug-in slot for SFP modules / SFP module		
Diagnostics (via LED / RJ45) Port 1 (Gigabit)	• Status Link	active: Data transfer (Act):	Green Green flashing
	• Transmission mode (FDX)	flash short ON, long OFF: flash ON / OFF: flash long ON, short OFF:	10 Mbit/s 100 Mbit/s 1000 Mbit/s
Ports 2 ... 8	• Status Link	active: Data transfer (Act):	Green Green flashing
	• Transmission mode (FDX)	Half duplex: Half duplex - collisions: Full duplex:	OFF Yellow flashing Yellow
Diagnostics (via LED / SFP) SFP Link 1*, 9, 10	Status Link	active: Data transfer (Act):	Green Green flashing
Power supply S1	Input voltage DC Input voltage AC Input current Termination	110 / 220 V DC (88 ... 370 V DC) 110 / 230 V AC (100 ... 240 V DC) max. 0.55 A 3-pole screw terminal, pluggable (AC: L / N / PE; DC: + / - / PE)	
S2	Input voltage Input current Termination	24 / 48 V DC (21 ... 57 V DC) ca. 500 mA (at 24 V DC) 2pole screw terminal, pluggable	
PoE(PD)	Input voltage Input current Termination	48 V DC (44 ... 57 V DC) according to IEEE 802.3af Class 3(0) via port 5 (mode A or mode B)	
Diagnostics (via LED) LED S1; 2 LED 48V LED PD LED Run LED State	Power supply S1 (internal) / S2 (external) > 21 V DC: Power supply S1 (internal) / S2 (external) > 46 V DC: external power supply via PoE(PD) ON: Operating state: State MMC Memory Card active:	Green Green Green Green Green	

Alarm signalling contact	2 change-over contacts, potential-free, 30 V DC / 1 A 4-pole pluggable screw contact
Function contact	4-pole pluggable screw contact The function bridge changes the system state into „Active“ to activate a function sequence which is configured in the Management area.
Housing material	Metal
Dimensions (W x H x D)	126 x 105 x 106 mm (without connectors)
Weight	approx. 1.25 kg
Operating temperature	-40 °C ... +70 °C
Management	fully Managed via Web interface, SNMP, Telnet and V.24 (RS 232) Functions see page 88

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

<p>Ha-VIS mCon 1083-ASFP4 Ethernet Switch, managed, with 8 ports RJ45 3 ports for SFP modules</p> <p>including Set for assembly on standard rail</p>	<p>20 76 111 6304</p>		
---	-----------------------	--	--



**Industrial DC/DC converter
Serial Ha-VIS pCon 7000**
for centralised power supply
with degree of protection IP 20 / IP 65

General Description

These primary switched DC/DC converters of the product family Ha-VIS pCon 7000 are designed for the decentralised supply of control units, Ethernet components or automation devices in industrial areas and harsh environments.

With their wide range of input voltage, the units are suitable for world-wide use. The converters need no ground load and are short-circuit protected by primary and secondary power limitation.

The converters are maintenance free, vacuum potted and prepared for the use in devices with Protection Class I or II, depending on the type of the converter.

Features

- Wide input range
- Easy installation
- Galvanically separated
- Short circuit protected
- Ambient Temperature up to 70 °C

Advantages

- Wide input range for world-wide use
- Wide operating temperature range
- Mechanical stability for highest demands
- Can be used directly in industrial and railway environments
- Compact design and high power density
- Proofed against short-circuits, overloads and no-load operation
- International approvals

Application fields

- Industrial automation
- Automotive industry
- Railway applications



DC/DC converter
HARTING pCon 7150-110/48
 for centralised power supply
 with degree of protection IP 65

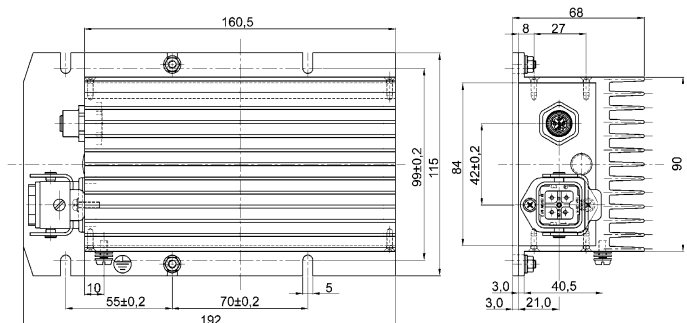
Han® 3 A / M12 A-coding	IP 65	110 V DC	48 V DC
----------------------------	-------	----------	---------

Input		Output	
Input voltage	50.4 ... 154 V DC (wide range input)	Output voltage	48 V DC -1 % / +2 %
Inrush current	$< 7 \times I_{in\ nom}$	Ripple	$\leq 1\ %\ p-p$
Switching frequency	approx. 70 kHz	Noise	$\leq 2\ %\ p-p$
Efficiency	$\geq 88\ %$	Starting time	$\leq 200\ ms$
Input filter	two-step filter	No load characteristics	no ground load
Reverse polarity protection	by means of connector with coding	Current limiting	105 ... 130 % stabilised current
Termination	Han® 3 A	Termination	M12 A-coding
Protection class	I		
General data			
Operating temperature	-40 °C ... +70 °C		
MTBF	tbd		
Cooling	free convection		
Weight	approx. 1400 g		

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

HARTING pCon 7150-110/48
 DC/DC converter

20 80 300 3026





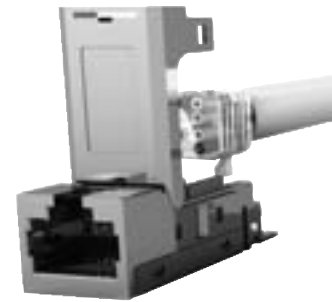
DC/DC converter
HARTING pCon 7060-110/24
 for centralised power supply
 with degree of protection IP 20

2x spring-type terminals	IP 20	110 V DC	24 V DC
--------------------------	-------	----------	---------

Input		Output	
Input voltage	43.2 ... 154 V DC (wide range input)	Output voltage	24 V DC ±2 %
Switching frequency	approx. 70 kHz	Ripple	≤ 1.5 % p-p
Efficiency	≥ 85 %	Noise	≤ 2 % p-p
Input filter	LC filter	Starting time	≤ 200 ms
Transient protection	1.8 kV / 5/50 µs	No load characteristics	no ground load
Reverse polarity protection	cross diode (together with external fuse)	Current limiting	105 ... 130 % stabilised current
Termination	Spring clamps	Termination	Spring clamps
Protection class	II (no earth connection necessary)		
General data			
Operating temperature	-40 °C ... +70 °C		
MTBF	> 1,400,000 h		
Cooling	mounting on heat sink with $R_{th} < 2.5 \text{ K/W}$, thermal coupling with Al base plate		
Weight	approx. 400 g		

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

HARTING pCon 7060-110/24 DC/DC converter	20 80 300 3025	<p>Technical drawing showing top and side views of the DC/DC converter. Dimensions are in mm. Top view dimensions: total width 69, terminal pitch 3.4, mounting hole offset 0.2, mounting hole diameter 4, terminal width 7, terminal pitch 55±0.2, total height 130, mounting hole offset 0.2, mounting hole diameter 4, terminal width 7. Side view dimensions: total height 122±0.2, mounting hole offset 2, mounting hole diameter 30, terminal width 28.</p>	
---	----------------	---	--



Ha-VIS preLink®
RJ45 jack module

Advantages

- Consistent connection technology in the cabling system
- Quick and easy assembling of data cables
- Small size, suitable for Hoods and Housings of series Han® 3 A and HARTING PushPull connectors RJ45 according to ISO/IEC 24 702, Variant 4
- Future proof, Cat. 6 Class E_A 500 MHz transmission performance, transmission rate up to 10 Gbit/s

Application fields

- Structured cabling for industrial premises
- For applications in IP20 and IP 65 / IP 67 environment

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

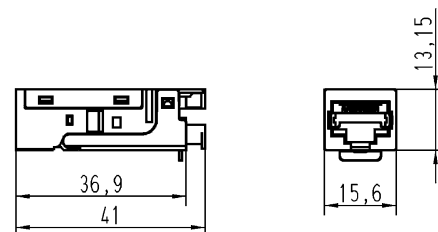
Ha-VIS preLink® set
RJ45 jack AWG 22/23
consists of:

- 1x Ha-VIS preLink® module RJ45 jack
- 1x Ha-VIS preLink® terminal module
- 1x cable tie

20 82 001 0001

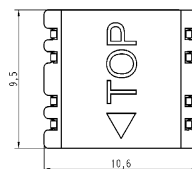
Ha-VIS preLink® module RJ45 jack
Termination: RJ45
No. of contacts: 8
Transmission Category 6, for Class E_A performance
Transmission rate: 10 Gbit/s
Shielding: fully shielded 360° flexible shielding termination
Cable sheath diameter 5 ... 9 mm
Housing material: zink die-cast, nickel-plated

20 82 000 0002



Ha-VIS preLink® terminal module
AWG 22/23
Contact block with IDC termination
No. of contacts: 8
Wire gauge: AWG 22/7 ... AWG 23/1 (0.25 ... 0.34 mm²) solid and stranded
Strand sheath diameter (incl. insulation) 1.3 ... 1.6 mm

20 82 000 0001



Available by September 2010



Ha-VIS preLink®
M12 connector module, male

Advantages

- Consistent connection technology in the cabling system
- Quick and easy assembling of data cables
- Easy to upgrade from 10 / 100 Mbit/s to 1 / 10 Gbit/s
- Compact design

Application fields

- Structured cabling for industrial premises
- Safety engineering, observation cameras, monitors and displays
- Next generation of factory automation

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Ha-VIS preLink® set*
M12 connector, male, 4-poles

Termination: M12 D-coding
 No. of contacts: 4
 Transmission performance: Category 5, Class D
 Transmission rate: 10 / 100 Mbit/s
 Shielding: yes
 Cable diameter: 5 ... 9 mm
 Housing material: zink die-cast, nickel-plated

20 82 005 0001



mating face

Ha-VIS preLink® set*
M12 connector, male, 8-poles

Termination: M12, shielding cross
 No. of contacts: 8
 Transmission performance: Category 6, for Class E_A
 Transmission rate: 1 / 10 Gbit/s
 Shielding: yes
 Cable sheath diameter: 5 ... 9 mm
 Housing material: zink die-cast, nickel-plated

20 82 006 0001

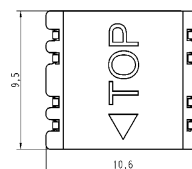


mating face

Ha-VIS preLink® terminal module
AWG 22/23

Contact block with IDC termination
 No. of contacts: 8
 Wire gauge: AWG 22/7 ... AWG 23/1 (0.25 ... 0.34 mm²)
 solid and stranded
 Strand sheath diameter (incl. insulation): 1.3 ... 1.6 mm

20 82 000 0001



* ... Set consists of 1x M12 connector, male / 1x terminal module



Ha-VIS preLink®
assembly tool

Advantages

- IDC-bonding and wire cutting in one step

Application fields

- Professional assembly tool for Ha-VIS preLink® terminal modul

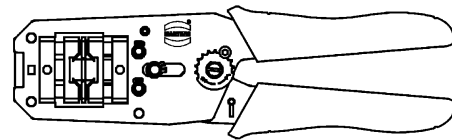
Identification

HARTING assembly tool
for Ha-VIS PreLink® terminal module

Part number

20 82 000 9901

Drawing



Dimensions in mm



HARTING Han® 3 A RJ45 Cat. 6 Hybrid 4x1.5

Advantages

- Reduction of installation time up to 50 %
- 10 Gigabit Ethernet and high power connection for 48 V DC / 16 A
- Space saving at the devices for the connections
- Cost reduction

General Description

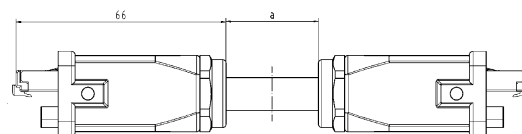
This products offers the possibility to connect different applications with one combined connection for data communication and power supply instead of the two connections. Typical applications for this hybrid connection are:

- Broadcast applications, like video walls
- Traffic control systems
- Applications for decentral automation, like DC servo drives or industrial W-LAN access points

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

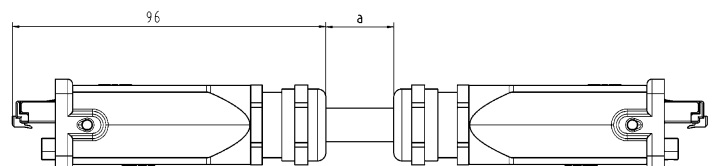
System cable
 4x2x AWG 28/7 / 4x 1.5 mm²
 PUR, black
 2x Han® 3 A Cat. 6 Hybrid
 Plastic version, short

length (a)	1.5 m	09 45 725 1503
	3.0 m	09 45 725 1505
	5.0 m	09 45 725 1507
	10.0 m	09 45 725 1512
	20.0 m	09 45 725 1514



System cable
 4x2xA WG 28/7 / 4x 1.5 mm²
 PUR, black
 2x Han® 3 A Cat. 6 Hybrid
 Metal version

length (a)	1.5 m	09 45 725 1533
	3.0 m	09 45 725 1535
	5.0 m	09 45 725 1537
	10.0 m	09 45 725 1542
	20.0 m	09 45 725 1544



Identification	Part number	Drawing	Dimensions in mm
<p>Device side Hybrid panel feed through</p> <p>Plastic version, black</p> <p>Metal version, grey Metal version, Han® M, black</p>	<p>09 45 225 1300</p> <p>10 12 005 1002 09 45 215 1301</p>		
<p>Cable side Hybrid connector sets including Cable manager (CM)</p> <p>Plastic version, black, CM white Plastic version, black, CM blue</p> <p>Metal version, grey, CM white Metal version, grey, CM blue Metal version, Han® M, black, CM white Metal version, Han® M, black, CM blue</p>	<p>09 45 125 1700 09 45 125 1710</p> <p>09 45 115 1700 09 45 115 1710 09 45 115 1701 09 45 115 1711</p>		
<p>Hybrid cable, 8-wire, Cat. 6 4x2xAWG 28/7 4x1.5mm² PUR</p> <p>Ring, 20 m Ring, 50 m Reel, 100 m</p>	<p>09 45 600 0332 09 45 600 0342 09 45 600 0302</p>		



Ha-VIS Smart Patch Cable IP 20 Cat. 6

Advantages

- Easy and fast illuminated detection of patch cables
- Easy to use
- Transmission performance in acc. with Cat. 6 ISO/IEC 11 801
- Compact and space saving plug by dual boot design
- Capable for Multiport applications
- Very robust locking lever protection and unlocking latch
- Good shielding against EMC influence
- Flame retardant and halogen-free
- Colour coding option

General Description

This RJ45 patch cable comes with illuminated RJ45 Ethernet plugs. The plugs are very easy and comfortable to identify each other over distances up to 100 meters, e.g. in Clusters of Racks in data centres facilitate enormous the allocation of ports.

Each RJ45 connector has an integrated LED which is illuminated by a detector. It works in anyway if the connectors are plugged in or not.

That function has no influence to the Ethernet data transmission.

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Ha-VIS Smart Patch Cable IP 20
Cat. 6

RJ45 according to IEC 60 603-7

Boot grey

Locking lever protection and
unlocking latch

Cable: S/FTP AWG 27

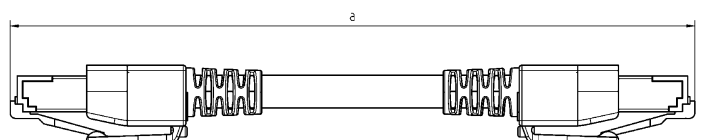
LSZH cable jacket, yellow


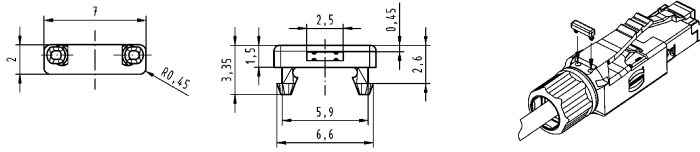
Wiring: 1:1 TIA/EIA-568-B, 8-wire,
shielded

100 % electrical tested

1.0 m	09 47 474 7201
2.0 m	09 47 474 7203
5.0 m	09 47 474 7206
7.0 m	09 47 474 7208
10.0 m	09 47 474 7211

further lengths on request



Identification	Part number	Drawing	Dimensions in mm
<p>Ha-VIS Smart Patch Cable detector</p>	<p>09 47 900 0001</p>		
<p>HARTING RJ Industrial® NG6 Colour clips</p> <ul style="list-style-type: none"> White Grey Yellow Magenta Red Blue Green Brown 	<ul style="list-style-type: none"> 09 45 850 0001 09 45 850 0002 09 45 850 0003 09 45 850 0005 09 45 850 0007 09 45 850 0008 09 45 850 0009 09 45 850 0010 		



Cabling products and Components for SERCOS III

Advantages

- Robust and Industrial Design
- Long life Ethernet connecting hardware
- Widely resistant cables
- Easy and rugged installation concept
- Guarantees best Cat. 5 resp. Cat. 5e performance
- Good EMC characteristics

General Description

Security and reliability are important requirements for an automation cabling system. To support SERCOS III applications in the field, HARTING offers a programme of cabling components to build the passive infrastructure for industrial and automation facilities. All components are especially designed for use in cabinets with IP 20 level as well as installation in harsh environments requiring IP 65 / IP 67 protection. The robust and completely shielded M12 D-coding connector is commonly used, well known, proven and tested in the area of automation. The product programme also covers industrial outlets, distribution modules, feed-through connectors and bulk heads as well as preassembled system cords, connect - or sets for on-site assembly and cables for fixed and flexible installation.

Identification

Part number

Drawing

Dimensions in mm

Flexible system cable in fix lengths (total length)

1.5 m	09 47 020 2003 018
3.0 m	09 47 020 2005 018
5.0 m	09 47 020 2007 018
10.0 m	09 47 020 2012 018
20.0 m	09 47 020 2014 018

Trailing system cable in fix lengths (total length)

1.5 m	09 47 020 2023 018
3.0 m	09 47 020 2025 018
5.0 m	09 47 020 2027 018
10.0 m	09 47 020 2032 018
20.0 m	09 47 020 2034 018



Identification	Part number	Drawing	Dimensions in mm
Flexible system cable HARTING PushPull to HARTING PushPull in fix lengths (total length)	1.5 m 09 47 363 6025 018 3.0 m 09 47 363 6027 018 5.0 m 09 47 363 6029 018 10.0 m 09 47 363 6034 018 20.0 m 09 47 363 6036 018		
Trailing system cable HARTING PushPull to HARTING PushPull in fix lengths (total length)	1.5 m 09 47 363 6047 018 3.0 m 09 47 363 6049 018 5.0 m 09 47 363 6051 018 10.0 m 09 47 363 6056 018 20.0 m 09 47 363 6058 018		
SERCOS III 4-pole M12 D-coding to M12 D-coding in fix lengths (total length)	1.5 m 09 47 222 2003 018 3.0 m 09 47 222 2005 018 5.0 m 09 47 222 2007 018 10.0 m 09 47 222 2012 018 20.0 m 09 47 222 2014 018		
SERCOS III 4-pole M12 D-coding to RJ45 in fix lengths (total length)	1.5 m 09 47 220 2004 018 3.0 m 09 47 220 2005 018 5.0 m 09 47 220 2007 018 10.0 m 09 47 220 2012 018 20.0 m 09 47 220 2014 018		
SERCOS III flexible cable 4-pole, shielded SF/UTQ, type B	ring 20 m 09 45 600 0134 ring 50 m 09 45 600 0144 ring 100 m 09 45 600 0104 reell 500 m 09 45 600 0114		
SERCOS III trailing cable 4-pole, shielded SF/UTQ, type C	ring 20 m 09 45 600 0137 ring 50 m 09 45 600 0147 ring 100 m 09 45 600 0107 reell 500 m 09 45 600 0117		



Ha-VIS EtherRail

highly elastic data cable, 4-poles, Cat. 5 / 5e

Advantages

- Transmission of Fast Ethernet 100Base-T acc. IEEE 802.3
- Suitable for data cabling in rail vehicle and between coaches
- Design according EN 45 545-1 and TS EN 45 545-5, flame-retardant and heat resistant acc. DIN 5510 (1-4) and EN 50264-1
- Temperature range from -40 °C up to +90 °C
- LSZH and RoHS compliant

General Description

This data cable was especially designed for the cabling connection between coaches but also for installation within rail vehicles and busses. The cable fulfils the actual safety and fire protection requirements acc. international standards. The robust star quad cable construction guaranties a reliable data transmission up to 100 Mbit/sec. The cable was designed in accordance with HARTING connecting hardware components like Han-Quintax® and Han® M12 crimp series.

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Ha-VIS EtherRail
highly elastic data cable,
star quad 1x4xAWG22/19, Cat. 5 / 5e

Sheath material: Elastomer, electron beam cross-linked

Colour: Black

Cable sheath diameter: (7.4 +/- 1) mm

Transmission performance:
Category 5 / 5e
transmission class D
up to 100MHz acc. to
ISO/IEC 11 801 and
EN 50 173-1

Transmission rate: 10/100 Mbit/sec.

Operating temperature
range: -40 °C ... +90 °C

Cable weight: 77 kg/km

ring 100 m

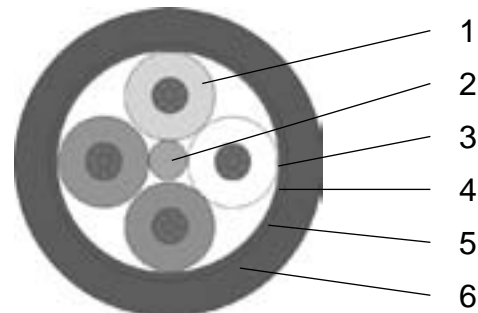
reel 500 m

reel 1000 m

09 45 600 0138

09 45 600 0148

09 45 600 0158



- 1. Conductor**
4x stranded copper wire, tin-plated AWG 22 19 x 0,16 mm
Isolation: PE, Comp. 655
colours: Blue, Yellow, White, Orange
- 2. Filler**
- 3. Interlayer**
Aluminium foil-clad polyester
- 4. Screening**
Double shield, copper braid and foil
- 5. Banding**
Textile braid ribbon
- 6. Jacket**
Elastomer electron beam cross-linked Comp 603

The next generation of the first field installable RJ45 connector

In 2004 under the product name HARTING RJ Industrial® – HARTING launched the RJ45 connector (plug) for Fast Ethernet onto the market and thus set a new benchmark for industrial Ethernet cabling. The innovative connector is equipped with vibration proof HARAX® insulation displacement connector technology and allows the connection of twisted pair industrial Ethernet cables with solid or stranded wires and a wire-section of up to AWG 22.

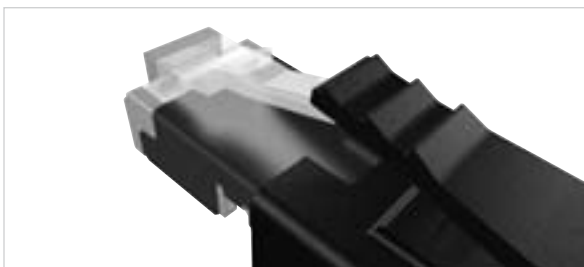
The next generation of HARTING RJ Industrial® 10G RJ45 connectors now combines the experiences of 100.000-fold application of this global first, without special tools, lockable RJ45 connector with market demands of 1 and 10 Gigabit Ethernet. It is equipped for all commercially 2 or 4 twisted pair Ethernet cables and allows an 8-pole cable connection with solid or stranded wire section of AWG 27 to AWG 22. A newly developed cable clamp ensures a secure fixing in a range from 4.5 – 9 mm.

And so the connector can be attached to almost all cable types used in office and the industry, even the usual solid cables installed in buildings.



For this reason the HARTING RJ Industrial® 10G RJ45 connector can be used in a wide range of cables and consistently fulfills customer demands for simple, safe and rapid cabling. In particular, the captive cable manager, with the clear circuit plan on the connector, enables optimum and timesaving cabling.

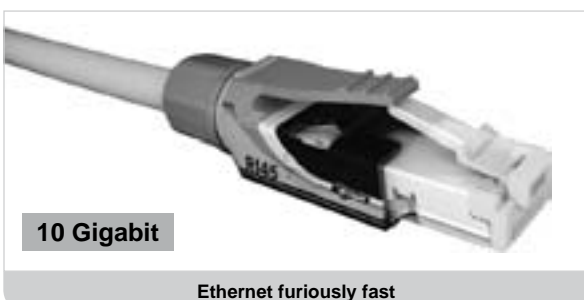
The HARTING RJ Industrial® 10G RJ45 connector suits industrial needs, is robust and nonetheless lightly constructed and optimized for use in multi-port sockets. Colour clips for colour coding are optional and if required can be equipped with an RFID chip for saving patch cable-ID and parameters.



Industrial strength actuator with a locking lever protection

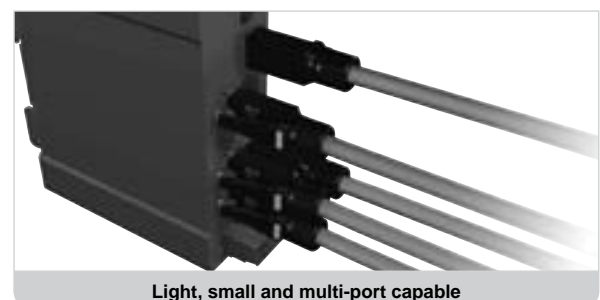


Optional colour coding with colour clips



10 Gigabit

Ethernet furiously fast



Light, small and multi-port capable

The universal connector for Automation IT

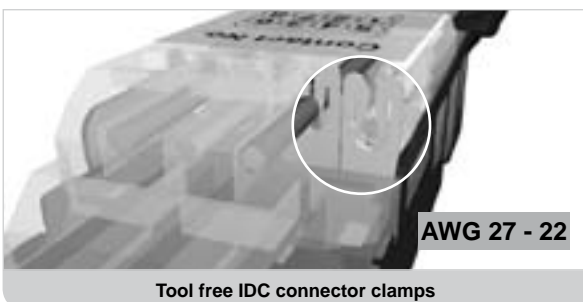
The HARTING RJ Industrial® 10G RJ45 connector with its outstanding product characteristics can be used in office networks as well as in all industrial applications. Through the integration of RJ45 functions container in all HARTING IP 65/67 series from Han® 3 A to PushPull this innovative connector technology is well suited to rough industrial application as well as for outdoor uses and offers the user universal and secure connector technology in all fields of Automation IT cabling.

The HARTING RJ Industrial® 10G RJ45 connector is the innovative and future proof platform for Fast Ethernet, 1 Gigabit or

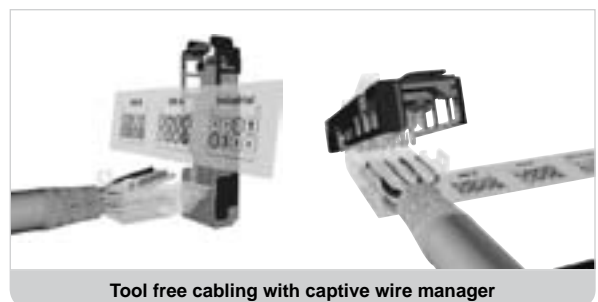


10 Gigabit Ethernet: It can be universally applied – from Office IT to industrial automation or also in outdoor applications. HARTING RJ Industrial® 10G – the new standard RJ45 connector for Automation IT.

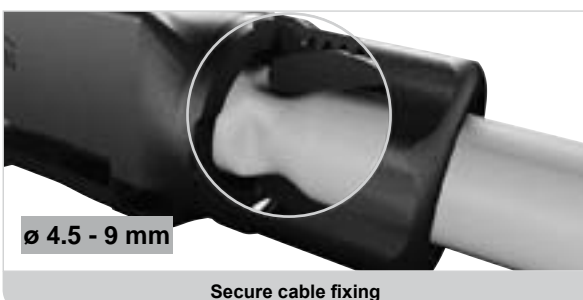
- Double connector friendly for wire sections of AWG 27 / 7 to AWG 22 / 1 and cable diameter from 4.5 to 9 mm for all usual Ethernet cable types in industry and Office IT
- Safe and rapid tool free cabling with captive wire manager
- Cat. 6, transfer class E_A, suitable for 1 and 10 Gigabit Ethernet
- Small and multi-port capable
- Suitable for industry, robust yet light
- The same installation technology for all connector types from IP 20 to PushPull



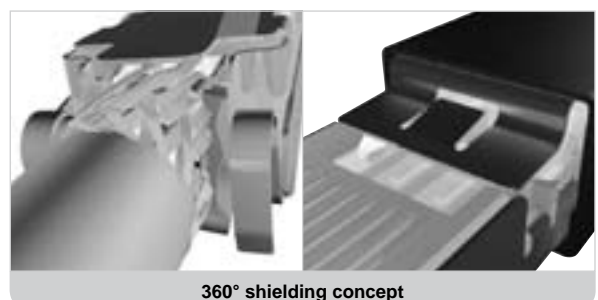
Tool free IDC connector clamps



Tool free cabling with captive wire manager



Secure cable fixing



360° shielding concept

Container principle for universal use

HARTING offers the most comprehensive product range for IP 65/67 protected Ethernet connectors on the market. The outstanding characteristic of all connector types is the universal connector technology and the use of the unchanging RJ45 function container in all series. The big advantage for the user: The basic steps of the connector cabling is always identical, regardless whether it is installed in the office environment IP 20 connector or the robust industrial IP 65/67 connector. Thereby, additional training effort is not required, it saves time and cost. For all Automation IT applications a universal, safe and rapid connector technology can be implemented with the HARTING installation technology.

The HARTING range currently consists of the following types:

- HARTING RJ Industrial® 10G – Connector for IP 20

- Han-Max® RJ45 10G – Connector for IP 65/67 (Variant 1 according to IEC 61076-3-106, preferred type for EtherNet/IP™ according to ODVA specification)
- HARTING PushPull RJ45 10G – Connector for IP 65/67 (Variant 4 according to IEC 61076-3-106, preferred type for industrial construction cabling)
- Han® 3 A RJ45 10G – Connector for IP 65/67 (Variant 5 according to IEC 61076-3-106, preferred type for PROFINET)
- Han® 3 A RJ45 Hybrid 10G – Connector for IP 65/67 (Variant 5 according to IEC 61076-3-106, preferred type for PROFINET)
- Han® PushPull RJ45 10G – Connector for IP 65/67 (Variant 14 according to IEC/PAS 61076-3-117, preferred type for PROFINET and AIDA [Automation Initiative of German Domestic Automobile manufacturers])

Alongside the available range, the integration of this RJ45 function container in further HARTING series, such as the Han-Modular® is possible and currently in preparation.



Universal installation technology for all connector types

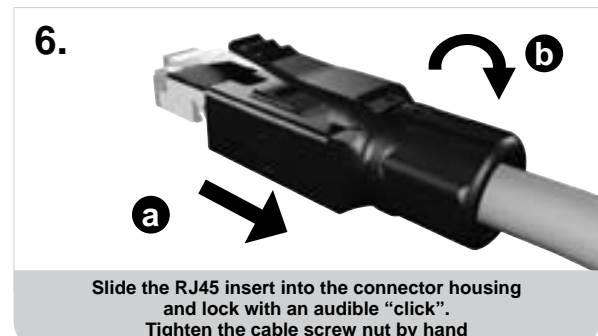
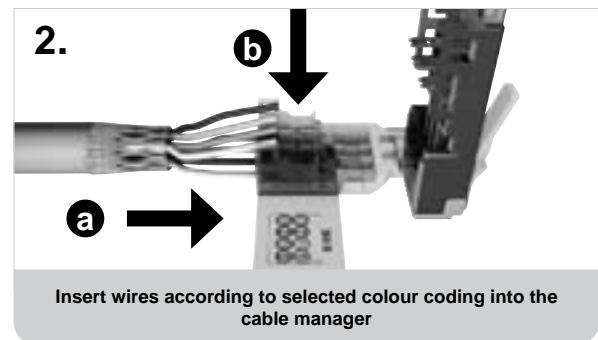
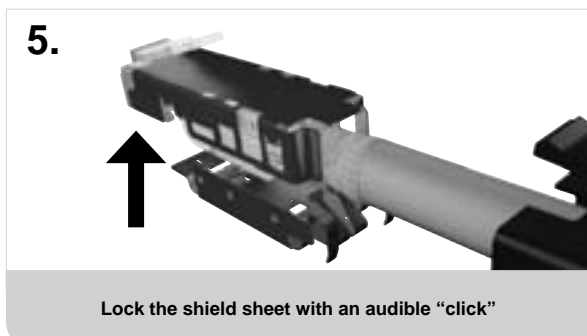
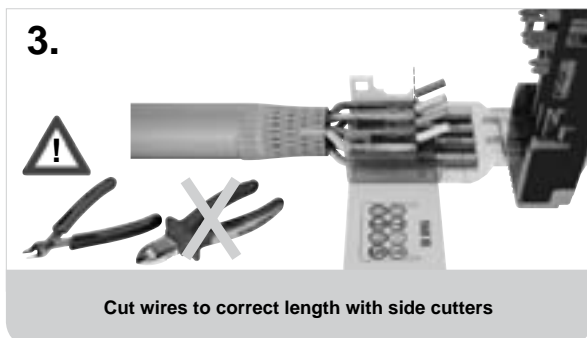
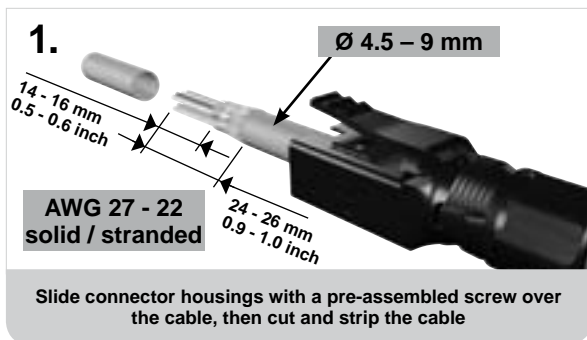
The cabling Simple, safe and fast

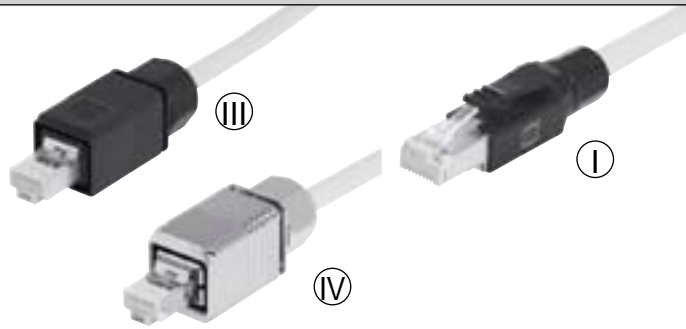
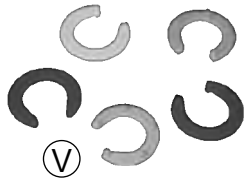
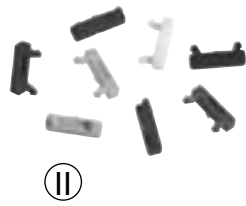
Connectors must allow a reliable cable connection with few parts and minimal effort.

With the development of the new HARTING RJ Industrial® 10G RJ45 connector these customer requirements were paramount. The connector housing with the novel cable clamp is delivered with pre-assembled connecting nut. The RJ45 insert comprises of only two parts. The moveable cable manager mounted on the connector body allows the simple insertion of wires and always guarantees a fault free circuit of the insulation displacement connector. For

rapid identification of the correct position of the coloured individual wires, the cable manager has been furnished with a label containing a circuit plan. This circuit label displays the universally used wire colours according to EIA/TIA-568/A and B and for 4-wire industrial Fast Ethernet applications indicating the relative contact allocation.

After wiring the connector a portion of the label remains on the plug thus allowing simple recognition of the relative contact position in the cable manager on re-wiring the plug. All these details permit – in only six steps – a rapid and safe local assembly, whereby a time saving of up to 30 % can be realized.





Identification

Part No.

Description

HARTING RJ Industrial® 10G connector



09 45 151 1560

- Field installable using IDC-technology
- For solid and stranded wire AWG 27 to AWG 22
- Cat. 6, transfer class E_A, suitable for 1/10 Gigabit Ethernet
- Temperature range –40 °C to +70 °C
- Degree of protection IP 20
- Cable diameter 4.5 – 9 mm

HARTING RJ Industrial® 10G colour clips



- White
- Grey
- Yellow
- Magenta
- Red
- Blue
- Green
- Brown

- 09 45 850 0001
- 09 45 850 0002
- 09 45 850 0003
- 09 45 850 0005
- 09 45 850 0007
- 09 45 850 0008
- 09 45 850 0009
- 09 45 850 0010

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

If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.

Each order number equates to a packing unit of 50 pieces.

HARTING PushPull RJ45 10G connector, plastic



09 45 145 1560

HARTING PushPull RJ45 10G connector, metal



09 45 195 1560

- Field installable using IDC-technology
- For solid and stranded wire AWG 27 to AWG 22
- Cat. 6, transfer class E_A, suitable for 1/10 Gigabit Ethernet
- Temperature range –40 °C to +70 °C
- Degree of protection IP 65 / IP 67
- Cable diameter 4.9 – 8.6 mm

HARTING PushPull colour clips

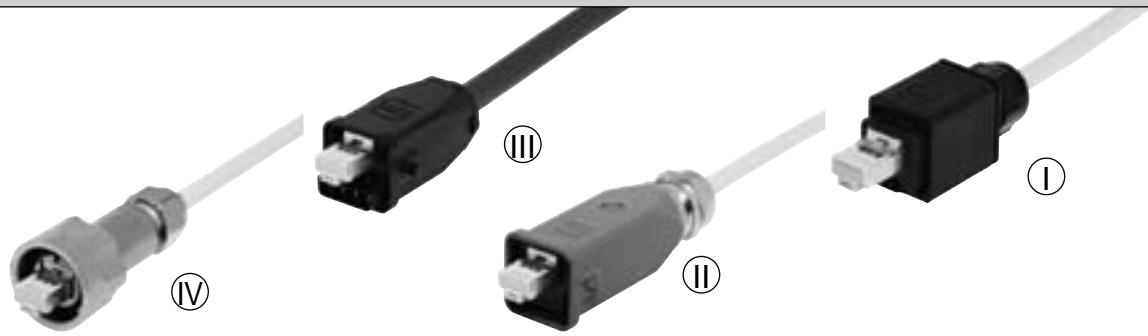


- White
- Yellow
- Red
- Blue
- Green

- 09 45 840 0011
- 09 45 840 0013
- 09 45 840 0017
- 09 45 840 0018
- 09 45 840 0019

Colour clips for colour coding the HARTING PushPull connectors

Each order number equates to a packing unit of 10 pieces.



Identification	Part No.	Description
Han® PushPull RJ45 10G connector, plastic (I)	09 35 225 0421	<ul style="list-style-type: none"> • PROFINET standard solution according to the demands of the German automobile industry (AIDA) • Field installable using IDC-technology • For solid and stranded wire AWG 27 to AWG 22 • Cat. 6, transfer class E_A, suitable for 1/10 Gigabit Ethernet • Temperature range –40 °C to +70 °C • Degree of protection IP 65 / IP 67 • Cable diameter: Plastic: 6.5 – 9.5 mm Metal: 4 – 11 mm
Han® PushPull RJ45 10G connector, metal (I)	09 35 225 0401	
Han® 3A RJ45 10G connector, plastic (II)	09 45 125 1560	<ul style="list-style-type: none"> • Field installable using IDC-technology • For solid and stranded wire AWG 27 to AWG 22 • Cat. 6, transfer class E_A, suitable for 1/10 Gigabit Ethernet • Temperature range –40 °C to +70 °C • Degree of protection IP 65 / IP 67 • Cable diameter 5 – 9 mm
Han® 3A RJ45 10G connector, metal (II)	09 45 115 1560	
Han® 3A RJ45 10G connector insert (II)	09 45 100 1560	
Han® 3A RJ45 Hybrid 10G connector, plastic (III)	09 45 125 1760	<ul style="list-style-type: none"> • PROFINET data and 24 volt power supply in one connector • 4 power contacts with max. 48 V / 16 A • Field installable using IDC-technology • For solid and stranded wire AWG 27 to AWG 22 • Cat. 6, transfer class E_A, suitable for 1/10 Gigabit Ethernet • Temperature range –40 °C to +70 °C • Degree of protection IP 65 / IP 67 • Cable diameter 6 – 12 mm
Han® 3A RJ45 Hybrid 10G connector, metal (III)	09 45 115 1760	
Han-Max® RJ45 10G connector (IV)	09 15 300 0431	<ul style="list-style-type: none"> • Field installable using IDC-technology • For solid and stranded wire AWG 27 to AWG 22 • Cat. 6, transfer class E_A, suitable for 1/10 Gigabit Ethernet • Temperature range –40 °C to +70 °C • Degree of protection IP 65 / IP 67 • Cable diameter 4 – 8 mm

The innovative solution

With *har-speed* M12 HARTING bases the Ethernet network on a sustainable M12 foundation. The *har-speed* M12 differs significantly from today's M12 connectors for Ethernet because it is based on a 4-pair connector face with paired shielding. This allows *har-speed* M12 to be used for Ethernet transfer rates up to 10 Gigabit. The new HARTING *har-speed* M12 connector is, therefore, capable of complying with the high requirements of the transfer class E_A, respectively the Cat. 6_A. For the first time an M12 cabling system can be used for relevantly high data performance and permanent sustainability.

The *har-speed* M12 connectors can be optimally used for applications with bandwidths in machine and facility engineering, but also for the IP 67 infrastructure. The basis for the new development is the new PAS 61076-2-109 that defines a uniform connector face for 8-pole M12 connectors.



The new connector face complies with the following requirements:

- Maximum data rates through the configuration of the contacts in conformance with Ethernet technology.
- Minimal interaction and perfect shielding through paired shielding of the contacts.
- Fault proof connection through coding of the connector face. A connection error with other 8-pole M12's is impossible.

Overmolded versions in different lengths and a crimp connector for the local cabling are the first system components for a comprehensive cabling infrastructure solution by HARTING.

Technical Data


har-speed M12 connector

- Cabling with crimp technology
- Compact, robust design
- Fully shielded
- Transfer class E_A for 1 and 10 Gigabit Ethernet
- AWG 28 to AWG 24
- Temperature range -40 °C to 85 °C
- Protection class IP 65 / IP 67

har-speed M12 PCB receptacle

- Stable, industrial standard design
- Fully shielded
- Transfer class E_A for 1 and 10 Gigabit Ethernet
- Temperature range -40 °C to 70 °C
- Protection class IP 65 / IP 67



Identification	Part No.	Drawing	Dimensions in mm
<p>har-speed M12 connector</p>	<p>21 03 881 5805</p>		
<p>har-speed M12 PCB receptacle</p> 	<p>21 03 381 2801</p>		
<p>har-speed M12 single ended overmoulded system cable</p> <p>Length: 1 m 3 m 5 m 7 m 10 m</p>	<p>21 03 483 1801 21 03 483 1803 21 03 483 1805 21 03 483 1807 21 03 483 1810</p>		

Interference – Yesterdays problem!

In a fast developing technological environment the management of electromagnetic interference is becoming more challenging.

Therefore HARTING developed a range of filter solutions to help designers of electronic equipments to achieve the demanding goal of electromagnetic compatibility.

HARTING offers a wide range of solutions by the integration of a filter inside one of the most standard I/O ports on the market; the D-Sub.

From standard simple ferrite-filter solution to complex customized high performance filters, you will be able to find in the HARTING filter D-Sub range the adequate solution to protect your application from any introduction or radiation of noise through D-Sub port apertures.

Advantages

Wide range:

- 9, 15, 25 and 37 contact versions
- Various terminations such as solder buckets, straight and right angled solder pins
- A large range of accessories
- High performance (C-filter) as well as simple, quick and cost effective solutions (ferrite-filter)

Compatible with standard wave and lead-free reflow soldering (C-filter)

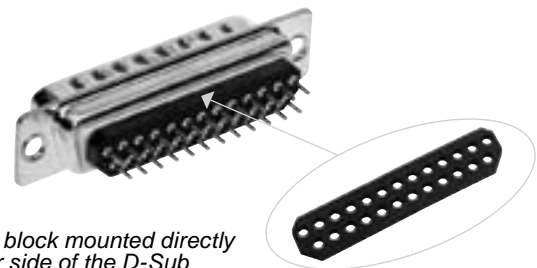
Same layout and shell dimensions as standard D-Sub connectors, no modification of PCB design necessary

Elimination of ringing, crosstalk phenomenon thanks to specific multilayer PCB used in C-filter design.

Flexible filter structure allowing a wide range of customization:

- Filter value (even pin by pin approach)
- Pi-filter
- Dielectric withstanding and working voltage
- Specific ESD / lightning protection

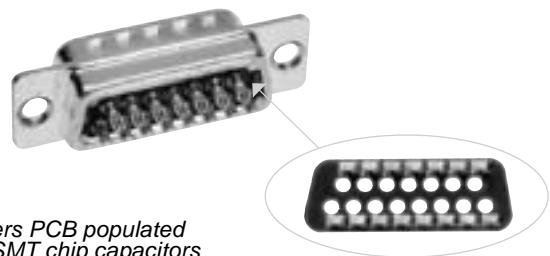
HARTINGs broad Filter range



Ferrite block mounted directly on rear side of the D-Sub

Ferrite-filter

Ferrite-filter D-Subs providing a low level of filtering thanks to simple blocks of inductive ferrite attached to the back end of the connectors. Providing a few dB attenuation only at high frequencies HARTING ferrite-filter D-Subs represent a cost effective solution in applications where the emission level is close to the limit.



4 layers PCB populated with SMT chip capacitors

C-filter

To address higher EMI disturbances HARTING propose a comprehensive range of C-filter D-Sub connectors. HARTING C-filter D-Sub integrates a patented 4 layer printed circuit board equipped with chip capacitors. This patented solution provides complete protection of the I/O port due to the filtering performance of the capacitors and the screening effect of the PCB. Further more the 4 layers PCB also limits the ability of interference to enter the equipment through the D-Sub aperture. Available in 4 standard filter values 47, 470, 1000 and 3900 pF HARTING C-filter D-Subs represent for all designers a smart filtering solution allowing replacement of a “defective” port by a filtered one without any change of the PCB design.

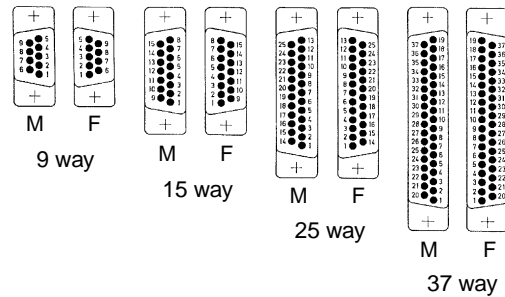
Filter adapter

To support engineers in the diagnosis of EMI disturbances HARTING has developed, in addition to its filter series a range of male/female filter D-Sub adapters.

These back-to-back adapters can be used as testing tools and replaced later on in production directly by a filtered D-Sub connector.

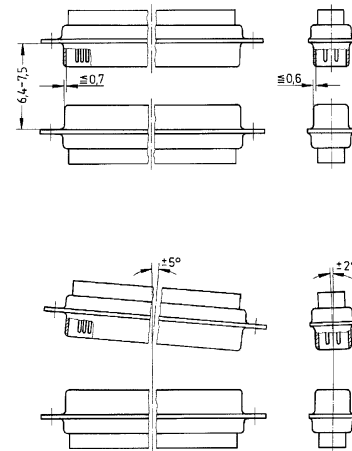
Number of contacts	9, 15, 25, 37
Working current	7.5 A max.
Working voltage	250 V AC max.
Dielectric withstanding voltage	500 V AC for 1 minute
Contact resistance	≤ 15 mΩ
Insulation resistance	≥ 1000 MΩ
Temperature range	-55 °C ... + 105 °C
Terminations	a) Solder buckets AWG 20 b) Solder pins for P.C.B. holes Ø 1 ± 0.05 mm c) Solder pins, angled 90° for P.C.B. holes Ø 1 ± 0.05 mm
Materials	
Insulation	PBT, flame retardant acc. to UL 94-V0
Contacts	Copper alloy
Contact surface	
Performance level	Performance level 3, as per IEC 60807-2, IEC 60512-25-2
Metal shell	Steel (tin-plated)

Contact arrangement
View from termination side



M = Male connector
F = Female connector

Mating conditions as per CECC 75 301



Minimum insertion loss

Frequency [MHz]	Attenuation [dB]
1	0.5
10	1.0
50	2.5
100	3.0
500	3.5
1000	4.0

Number of contacts

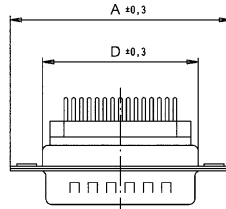
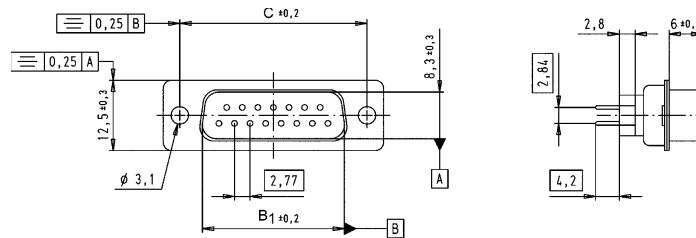
9-25



Solder pins, straight, through hole

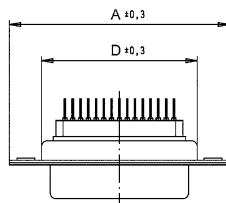
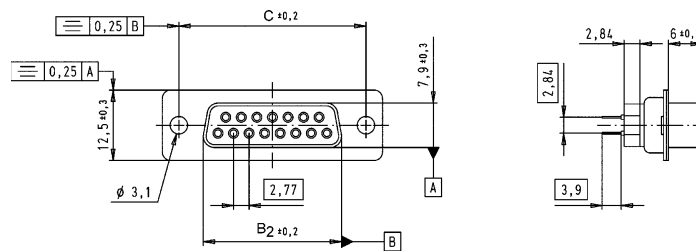
Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with ferrite-filter	9	09 64 122 7800	09 64 112 7800
	15	09 64 222 7800	09 64 212 7800
	25	09 64 322 7800	09 64 312 7800

Male connector

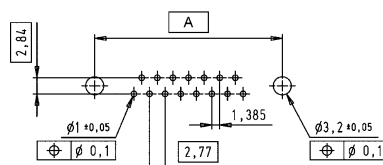


No. of contacts	A	B ₁	B ₂	C	D
9	30.8	16.92	16.3	25.0	19.2
15	39.2	25.25	24.6	33.3	27.7
25	53.1	38.96	38.3	47.1	41.1

Female connector



Board drillings



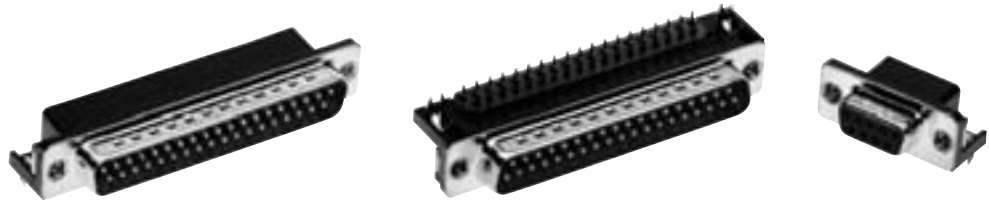
Dimensions in mm

D-Sub connectors with ferrite-filter



Number of contacts

9-37

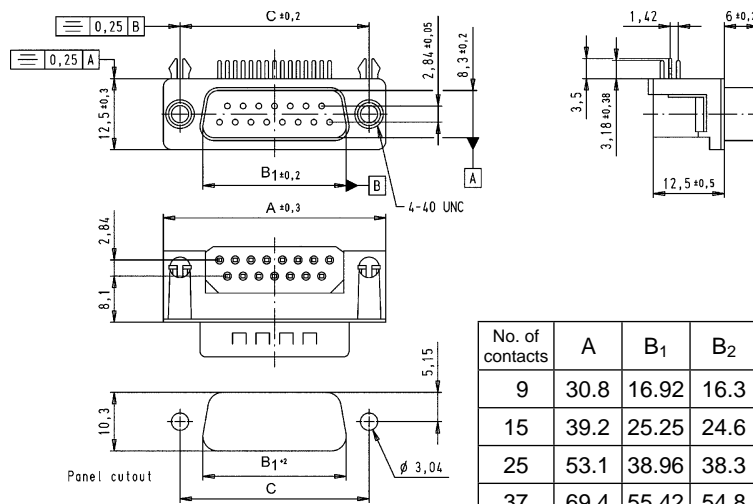


Solder pins, right angled, board lock and clinch nut

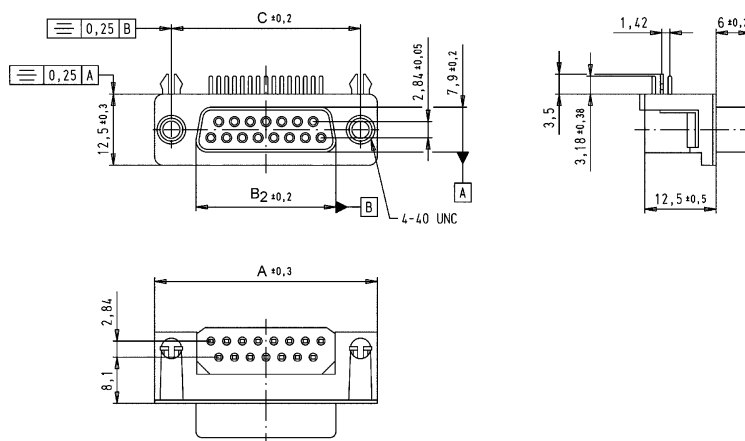
Identification	No. of contacts	Part No.
----------------	-----------------	----------

Connectors with ferrite-filter	male connectors		female connectors	
	9	09 64 123 7802	09 64 113 7802	
15	09 64 223 7802	09 64 213 7802		
25	09 64 323 7802	09 64 313 7802		
37	09 64 423 7802	09 64 413 7802		

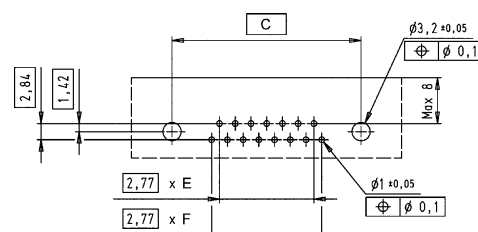
Male connector



Female connector



Board drillings



Dimensions in mm

Number of contacts

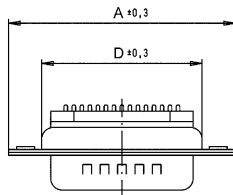
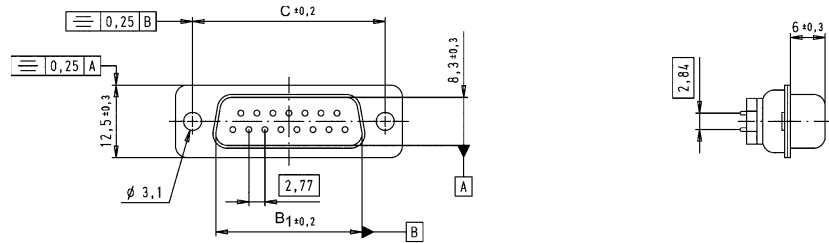
9-37



Solder buckets, through hole

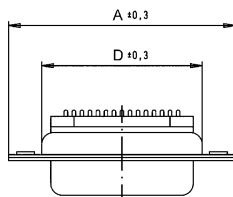
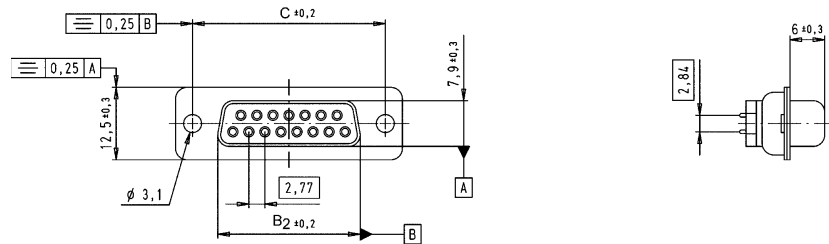
Identification	No. of contacts	Part No.	
		male connectors	female connectors
Connectors with ferrite-filter	9	09 64 121 7800	09 64 111 7800
	15	09 64 221 7800	09 64 211 7800
	25	09 64 321 7800	09 64 311 7800
	37	09 64 421 7800	09 64 411 7800

Male connector



No. of contacts	A	B ₁	B ₂	C	D
9	30.8	16.92	16.3	25.0	19.2
15	39.2	25.25	24.6	33.3	27.7
25	53.1	38.96	38.3	47.1	41.1
37	69.4	55.42	54.8	63.5	57.3

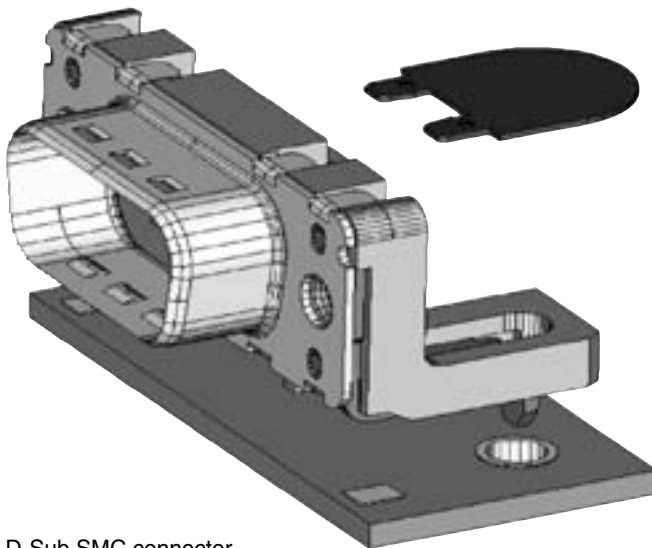
Female connector



Dimensions in mm

The continuing trend towards miniaturisation has revolutionised the assembly of electronic components. For the past 15 years, most components have been secured directly to the pcb surface by means of Surface Mount Technology (SMT). By dispensing with drilled holes on the pcb, a space saving of up to 70 percent is achieved.

Today, typical components such as ICs, resistors, capacitors, inductors, and connectors with straight terminal pins are almost exclusively fitted using SMD (Surface Mount Device) technology in mass production. In contrast, angled SMD connectors at the edge of the board have not been successful because of tolerance problems (co-planarity) and stresses during mating.



D-Sub SMC connector

“Pin in Hole Intrusive Reflow”*

In this process, the connector is inserted into plated through holes in a comparable way to conventional component mounting. All other components can be assembled on the pcb surface.

The components are positioned using pick-and-place machines. These automatic assembly machines differ according to whether the components are small, light-weight or bulky. Connectors, compared to ICs, are considered bulky (odd form). They are more difficult to grip, due to their comparatively heavy weight and larger size. But machines for odd form components, provide the higher insertion power, necessary to fit the components into pcb holes, which are filled with solder paste. Generally modern SMC production lines

are equipped with both types of machine. Therefore the "Pin in Hole Intrusive Reflow" process entails no extra investment costs for the user.

Conventional assembly process:

1. Application of solder paste
2. Positioning the components
3. Positioning odd form components
4. Reflow soldering
5. Pressing in or partially dip soldering the connector at the board edge
6. Quality inspection

“Pin in Hole Intrusive Reflow” assembly:

1. Application of solder paste
2. Positioning the components
3. Positioning odd form components
4. Reflow soldering
5. Pressing in or partially dip soldering the connector at the board edge
6. Quality inspection



D-Sub in pick and place machine equipped with vacuum nozzle

* Also known as Pin-in-Paste or Through Hole Reflow (THR)

Interface connectors were designed for Pin in Hole Intrusive Reflow with features like an inspection friendly black colour, tape and reel packaging for automated handling and it is self retaining on pcb via kinked pin. The open design – moulded from high temperature resistant material – ensures good heat distribution, so that current solder temperature profiles can be used. The special material of the insulation body withstands also the higher temperatures of lead free soldering.

Advantages for using interface connectors are:

- Partial dip soldering or press-in is no longer required
- High mechanical stability
- Complete compatibility with Surface Mount Technology
- Savings through integration into the automated assembly process
- Reduced floor space in the production plant

Application of solder paste

Before the components are assembled, solder paste is applied to all the solder pads and the plated through holes. Usually a screen printing process is used for this purpose. A squeegee moves across the pcb, which is masked with screens and presses the solder paste into all unmasked areas. A good solder joint is basically determined by the amount of the applied solder paste. Only a few parameters (illustrated on the right) will lead to the right quantity.

As an alternative to screen printing, the solder paste can be applied by means of a dispenser. A high-precision robot moves the dispenser to all required positions on the pcb. The dispensing method is particularly suitable for small pcb's or applications which demand high precision and flexibility in dispensing volumes.



Dispenser in operation

Solder paste volume

There are numerous scientific studies dealing with calculation of the required quantity of solder paste. These studies use various parameters, e.g. the shrinking factor of the paste during soldering or the thickness of the screens used for masking the pcb. Since such calculation methods are complicated to apply, the following rule of thumb has proved valuable in practice:

$$V_{\text{Paste}} = 2(V_H - V_P)$$

in which:

V_{Paste} = Required volume of solder paste

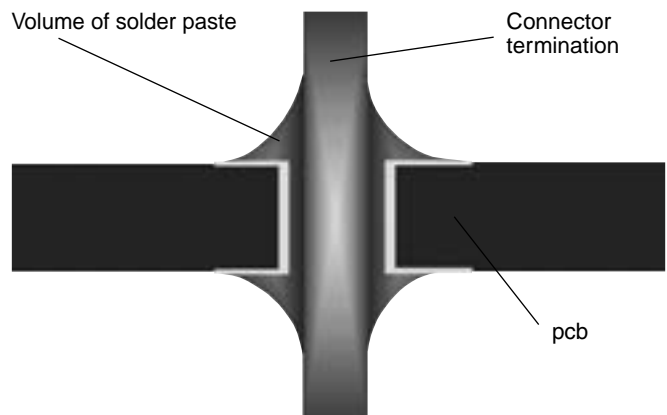
V_H = Volume of the plated through hole

V_P = Volume of the connector termination in the hole

Comment: the multiplier "2" compensates for solder paste shrinkage during soldering. For this purpose, it was assumed that 50 % of the paste consists of the actual solder, the other 50 % being soldering aids.

Requirements for the solder connection

At the beginning of a new production batch, the process parameters, such as quantity of solder paste and soldering temperature, can be set by interpreting simple cross-sections of the soldered connection. A reliable measure for achieving optimum parameters is the quantity of solder required to fill the hole. In soldered connections of high quality, the holes are filled to between 75 % and 100 %.



Plated through hole with connector termination

SMC connectors

SMC (Surface Mount Compatible) connectors have to withstand temperatures of up to 225°C in the reflow oven for 10 to 15 seconds. Therefore, the moulding must be made from a dimensionally stable plastic which expands at the same rate as the pcb material when subjected to heat.

The length of the connector contacts should be such that they protrude by no more than 1.5 millimetres after insertion to the pcb. Each contact collects solder on its tip as it penetrates the solder paste in the hole. So if the contact was too long, this solder would no longer be able to reflow back into the plated through hole by capillary action during the soldering process, therefore the quality of the soldered connection would suffer as a result.

Connector design must permit both automatic assembly with pick-and-place machines and manual positioning for test and pre-production batches. It is also important for the packaging of the connectors to be suitable for automated assembly. Experience shows that deep-drawn film and reel packaging fed into the pick-and-place machines with the aid of a conveyor system is particularly suitable.

HARTING SMC technology

HARTING offers its customers a complete system concept for integrating SMC technology into existing production lines. We manufacture a wide range of SMC connectors (3 and 5 row) in compliance with IEC 60603-2, D-Sub connectors in compliance with CECC 75301-802 and connectors from the har-mik® series with contact spacing of 1.27 millimetres. In addition, HARTING supports the market with packaging and processing concepts, which have been developed in collaboration with renowned manufacturers of SMC soldering and assembly plants.

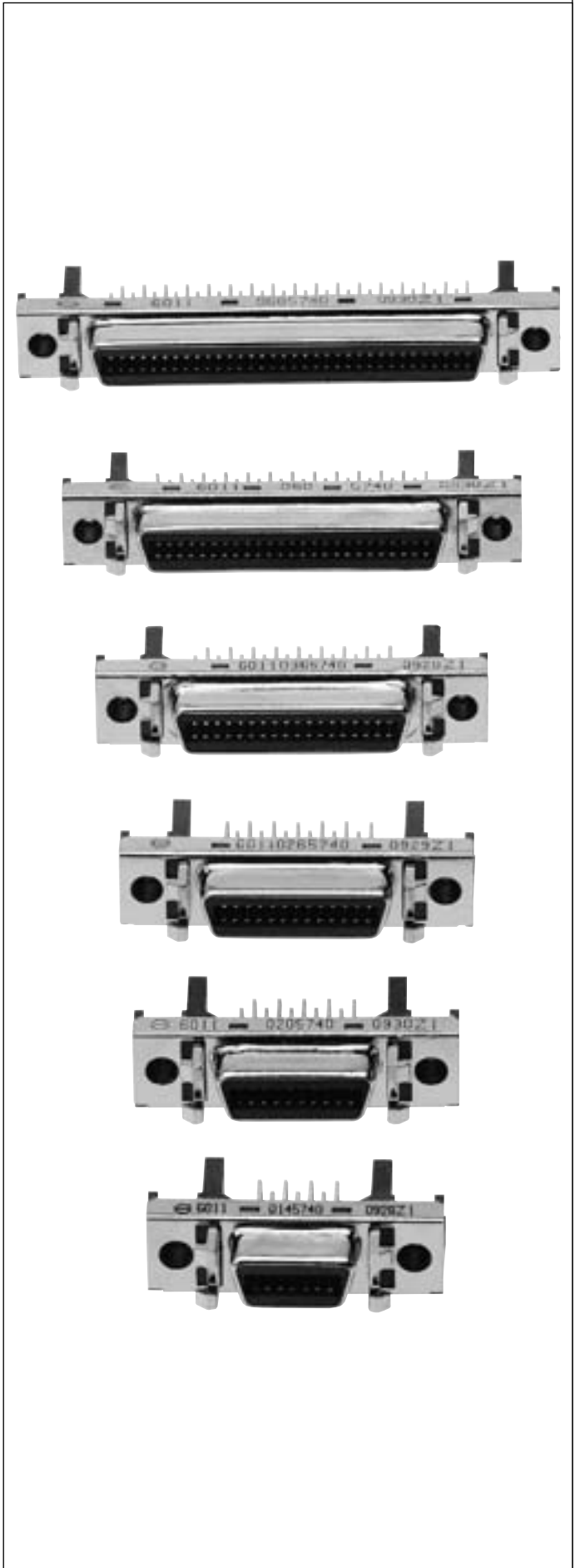
Advantages of the “Pin in Hole Intrusive Reflow” process:

- Partial dip soldering or press-in is no longer required
- Complete compatibility with Surface Mount Technology
- Complete integration into the automated assembly process
- Reduced floor space in the production plant
- As a rule, no additional investment costs



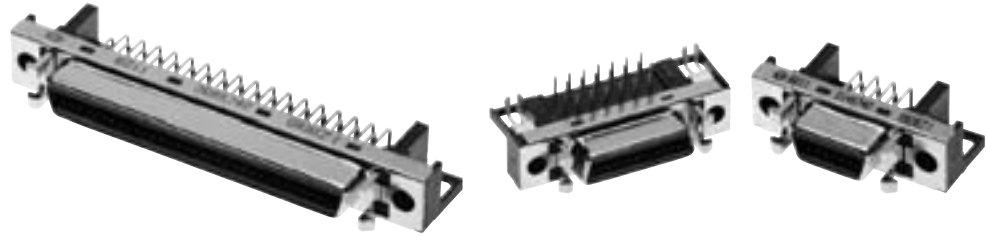
SEK connector mounted in a tape ready for placement using an odd form assembly station.

Number of contacts	14, 20, 26, 36, 50, 68
Pitch	1.27 mm
Working current	1 A
Working voltage	240 V ~
Test voltage $U_{r.m.s.}$	500 V
Contact resistance	$\leq 45 \text{ m}\Omega$
Insulation resistance	$\geq 10^3 \text{ M}\Omega$
Temperature range reflow soldering	-55 °C ... + 105 °C according to ICP/JEDEC J-STD-020 Revision D
Terminations	
Solder pins	Angled for pcb holes min. $\varnothing 0.62 \text{ mm}$
Materials	
Moulding	Thermoplastic resin glass-fibre filled UL 94-V0 Liquid Crystal Polymer (LCP)
Contacts	Copper alloy
Contact surface	
Contact zone	Selectively gold plated according to performance level
Metal shell	Die cast zamac or stamped steel, nickel-plated



Number of contacts

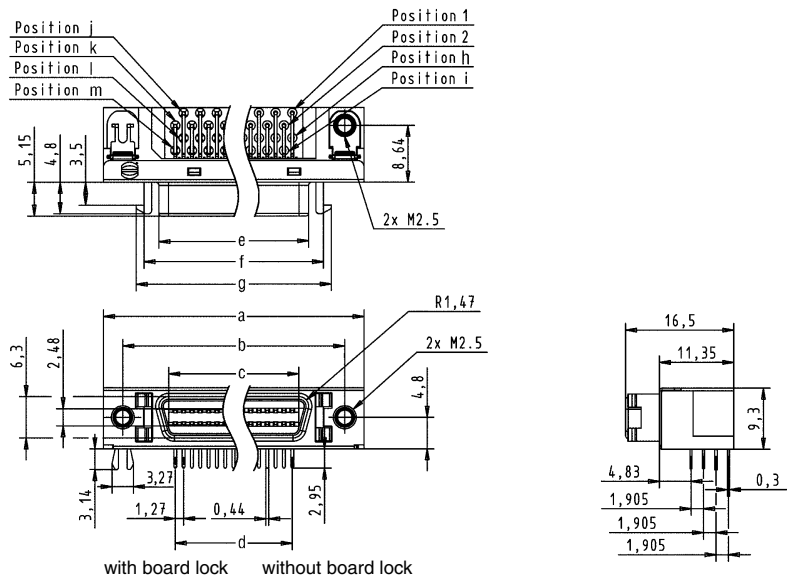
14-68



SMC female connectors, angled

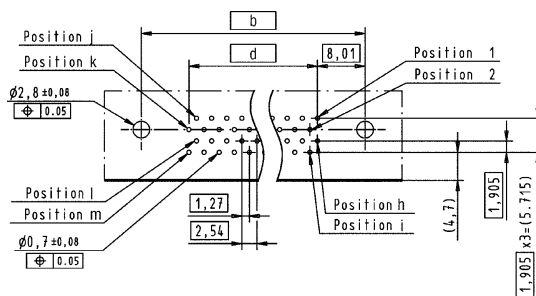
Identification	No. of contacts	for one reel (300 pieces)	Part No.	standard tray packaging
SMC female connectors with angled solder pins	14	60 11 014 57 .. 710		60 11 014 57 ..
	20	60 11 020 57 .. 710		60 11 020 57 ..
	26	60 11 026 57 .. 710		60 11 026 57 ..
	36	60 11 036 57 .. 710		60 11 036 57 ..
	50	60 11 050 57 .. 710		60 11 050 57 ..
	68	60 11 068 57 .. 710		60 11 068 57 ..
Without board lock	32			
With board lock	40			

Dimensions

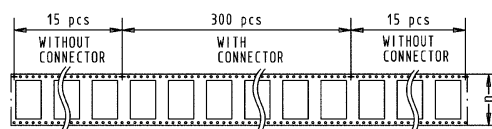


	a	b	c	d	e	f	g	h	i	j	k	l	m	n
14	29.54	23.64	9.62	7.62	12.62	17.14	19.54	8	9	7	6	14	13	44.0
20	33.35	27.45	13.43	11.43	16.43	20.95	23.35	11	12	9	10	19	20	56.5
26	37.16	31.26	17.24	15.24	20.24	24.76	27.16	14	15	13	12	26	25	56.0
36	43.51	37.61	23.59	21.59	26.59	31.11	33.51	19	20	17	18	35	36	56.0
50	52.40	46.50	32.48	30.48	35.48	40.00	42.40	26	27	25	24	50	49	72.5
68	63.83	57.93	43.91	41.91	46.91	51.43	53.83	35	36	33	34	67	68	88.5

Board drillings
(Components side)



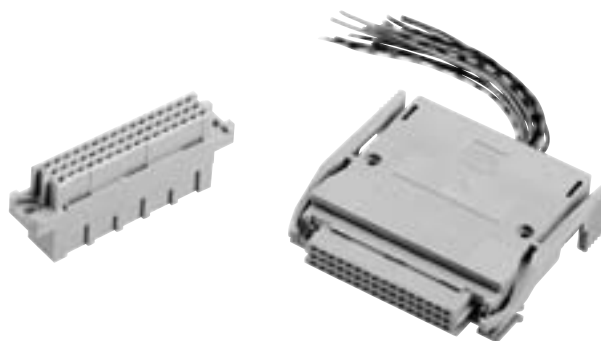
Packaging
(1 reel = 300 pieces)
Reel diameter = 380 mm



Dimensions in mm

Number of contacts

max. 48



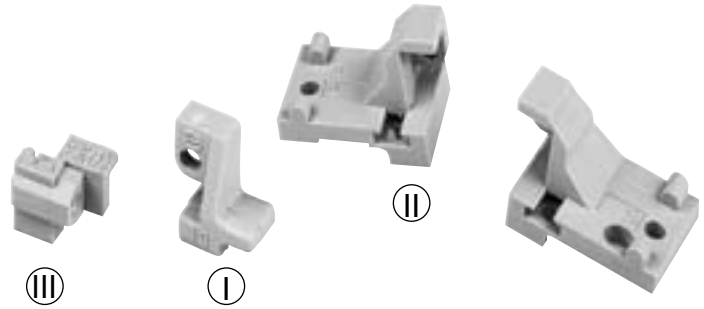
Female connectors, shell housings

Identification	Number of contacts	Part No.	Drawing type C	Dimensions in mm
<p>Female connector for crimp contacts</p> <p>Order contacts separately</p> <p>Type 2C</p>	48	09 23 048 3214 ^{f)}		
<p>Shell housing 2C for female connectors type 2C</p> <p>Supplied with: Shell 1x Blinding plate 1x Cable tie 1x Screw 2.2 x 9.5 4x (09 06 001 9974)</p>		09 23 048 0501 ^{f)}		

Identification	Part No.	Performance levels according to IEC 60 603-2.
<p>Female crimp contacts BC</p> <p>Bandoliered contacts (approx. 5,000 pieces)</p> <p>Bandoliered contacts (approx. 500 pieces)</p> <p>Individual contacts¹⁾</p>	2	1
	<p>09 02 000 6484</p> <p>09 02 000 8434</p> <p>09 02 000 8484</p>	<p>09 02 000 6474</p> <p>09 02 000 8444</p> <p>09 02 000 8474</p>
	<p>Wire gauge mm² AWG Insulation ø mm</p> <p>0.09 - 0.5 28 - 20 0.7 - 1.5</p> <p>3.5 + 0.5 mm of insulation is stripped from the wires to be crimped</p> <p>For the fabrication in line with the specification please use exclusively crimp tools approved by HARTING (see DIN EN 60352-2)</p>	<p>Bandoliered contacts</p> <p>Individual contacts</p>

¹⁾ Packaging unit 1,000 pieces

^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

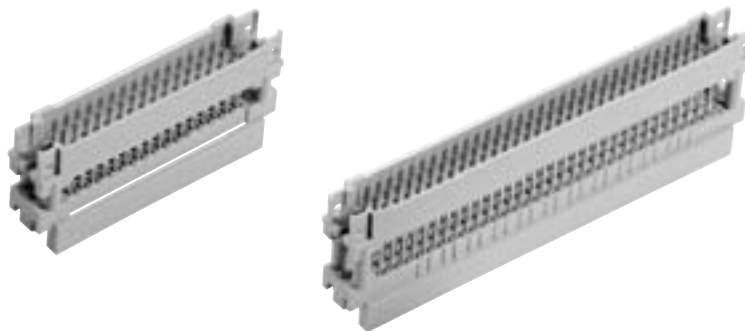


Accessories for shell housing 2C

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

Number of contacts

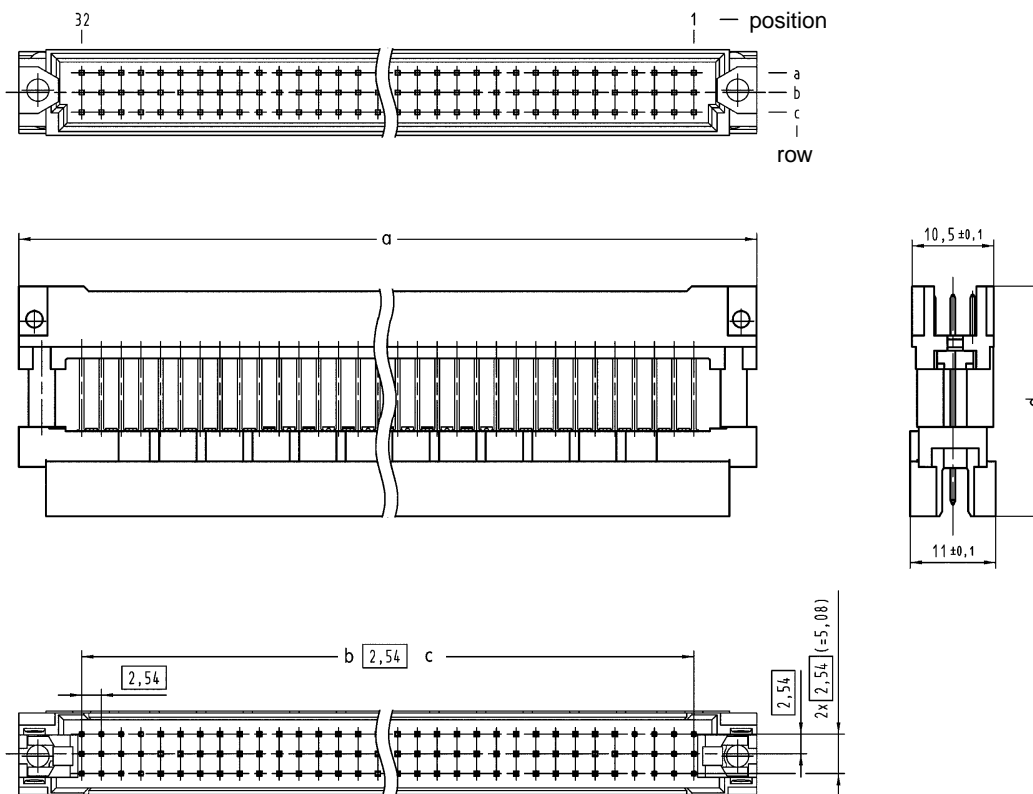
96, 48



Mezzanine Adapter

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2.		
				3	2	1
Male connector type R with pin shroud for pcb distance 41.0 mm	96		Performance level 3 on request			09 73 196 5531
Male connector type 2R with pin shroud for pcb distance 41.0 mm 37.5 mm	48				09 28 148 6532	09 28 148 5531

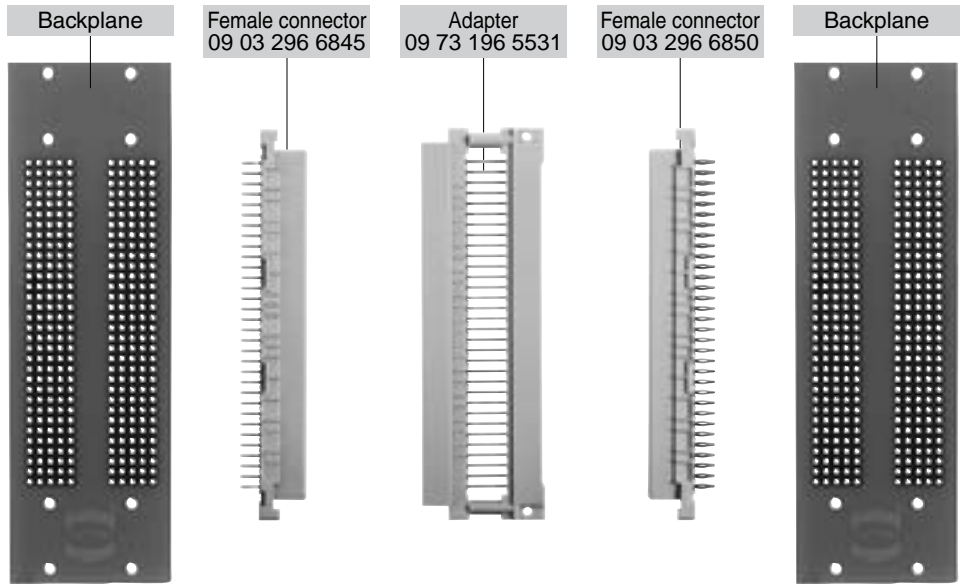
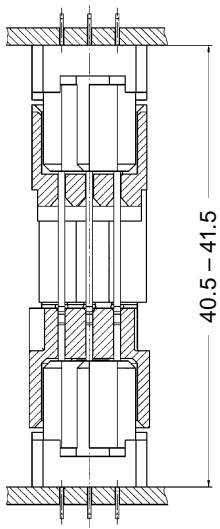
Dimensions



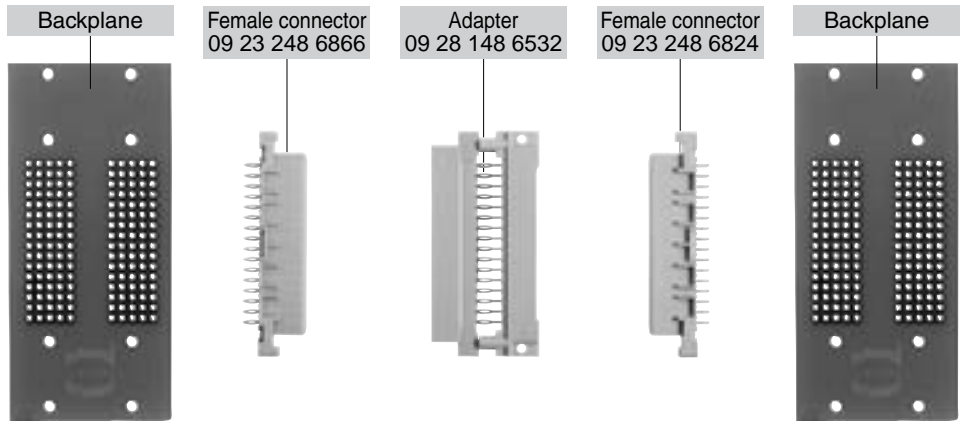
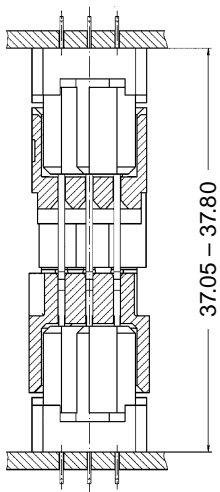
	a	b	c	d
09 73 148 5531	94.9 ± 0.1	31	78.74	29.6 ± 0.3
09 28 148 5531	54.9 ± 0.1	15	38.1	29.6 ± 0.3
09 28 148 6532	54.9 ± 0.1	15	38.1	26.15 ± 0.3

Dimensions in mm

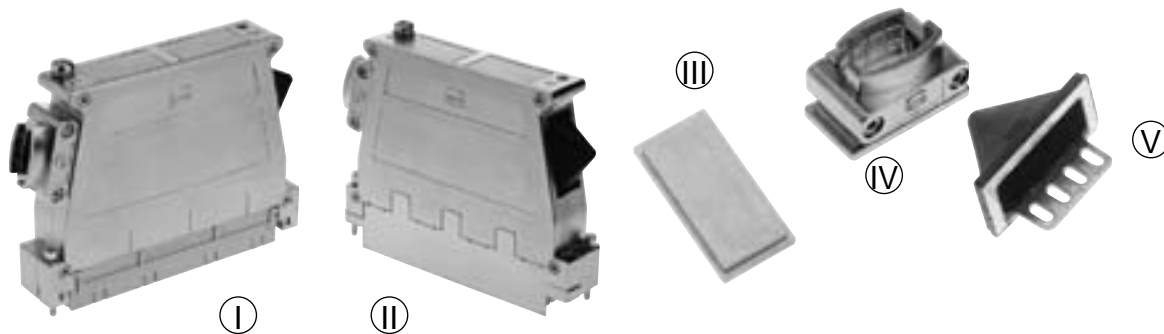
Application 1



Application 2

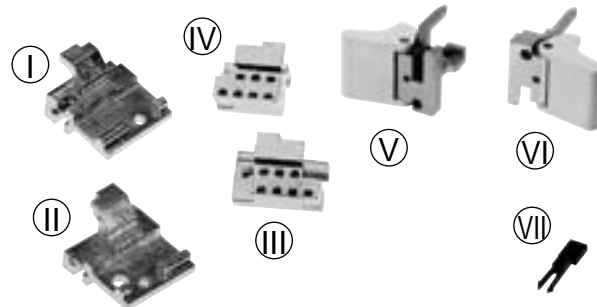


Shell housing D 20 metal for types F, H and MH



Identification	Part No.	Drawing	Dimensions in mm
<p>Shell housing D 20 metal</p> <p>①</p> <p>Supplied with:</p> <p>Shell with coding 1x</p> <p>Cover 1x</p> <p>Locking screw (hexagonal) M2.5 x 22 2x</p> <p>Screw (torx) M2.5 x 10 4x</p> <p>Earth screw M4 x 8 2x</p>	<p>09 06 848 0550</p>		
<p>Shell housing D 20 metal HF with nickel-plated surface</p> <p>②</p> <p>Supplied with:</p> <p>Shell with coding and HF-sealing spring 1x</p> <p>Cover with shielding plate 1x</p> <p>Locking screw (hexagonal) M2.5 x 22 2x</p> <p>Screw (torx) M2.5 x 10 4x</p> <p>Earth screw M4 x 8 2x</p>	<p>09 06 848 0551</p>		
<p>Blinding piece</p> <p>③</p>	<p>09 06 800 9951</p>		
<p>Cable clamp</p> <p>④</p>	<p>09 06 800 9955</p>		
<p>Cable grommet with strain relief</p> <p>⑤</p>	<p>09 06 800 9950</p>		

Shell housing D 20 metal HF for types F, H and MH



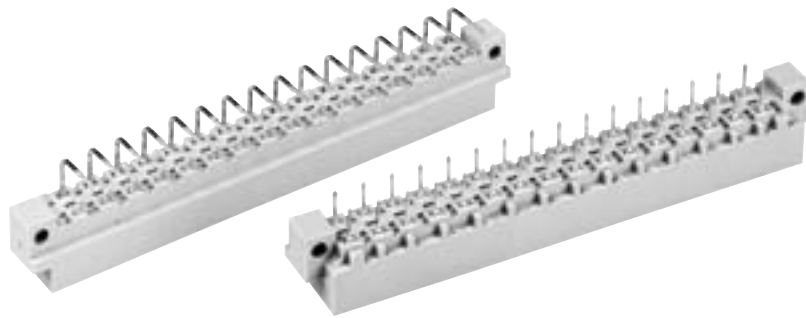
Identification	Part No.	Drawing	Dimensions in mm
<p>Fixing brackets B metallised for male connectors for 19" racks according to DIN EN 60297, part 3-101</p> <p>Single fixing (I) with nut M 2.5 DIN EN ISO 4036 (II)</p> <p>Multiple fixing with coding at fixing bracket with nut M 2.5 DIN 562 (III)</p> <p>(IV)</p>	<p>left 20 mm 09 06 901 9924^{f)}</p> <p>right 20 mm 09 06 901 9925^{f)}</p> <hr/> <p>left 20 mm 09 06 900 9997^{f)}</p> <p>right 15 mm 09 06 900 9996^{f)}</p>		
<p>Fixing brackets B metal for male connectors for 19" racks according to DIN EN 60297, part 3-101</p> <p>Single fixing (V) with ejector handle (VI)</p>	<p>left 09 06 800 9943</p> <p>right 09 06 800 9944</p>		
<p>Crimp flange insert</p> <p>Cable clamp cable-Ø appr. 5- 7 mm cable-Ø appr. 7-10 mm cable-Ø appr. 10-12 mm</p> <p>Blanking piece for hoods</p> <p>Code pin (VII)</p> <p>Earth screw</p>	<p>09 06 800 9952</p> <p>61 03 000 0141 61 03 000 0044 61 03 000 0143</p> <p>61 03 000 0042</p> <p>09 06 001 9905</p> <p>09 06 800 9958</p>	<p>Order 13 pieces per code comb</p>	

^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

Number of contacts

32

New
SMC
NFF F1/I2



Male connectors

Identification	Number of contacts	Contact arrangement	Part No.	Performance levels according to IEC 60 603-2.		
				3	2	1
Male connector with angled solder pins	SMC		09 04 132 7921	09 04 132 6921 09 04 132 6921 222^{f)} 09 04 332 6921 ^{b)} 09 04 632 6921 ^{c)}	09 04 132 2921 09 04 132 2921 222^{f)}	
				09 04 332 6919 ^{b)d)}		
				09 04 132 6951 09 04 632 6951 ^{c)}	09 04 632 2951 ^{c)}	
Male connector with straight solder pins				09 04 132 6922		
				09 04 132 6952		
Dimensions						
Board drillings Mounting side						

Dimensions in mm

▲ Male connectors with 2 leading contacts [(0.8 mm) pos. a2 and a32]

Other contact arrangements on request

b) Connectors with snap-in clips

c) Connectors with coding

d) CTI > 400

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

Number of contacts

48

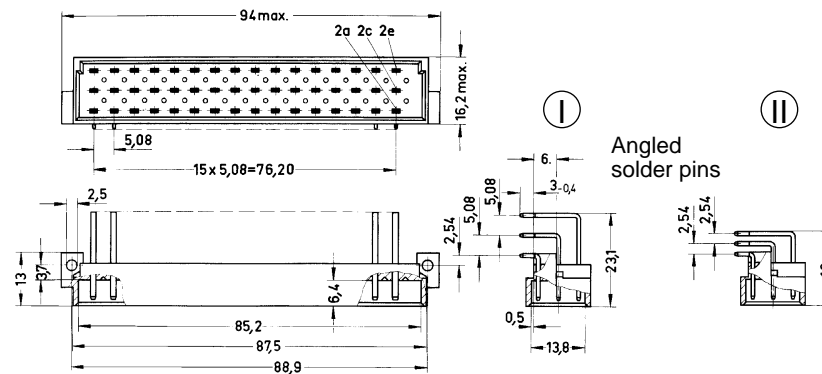
New
SMC
NFF F1/I2



Male connectors

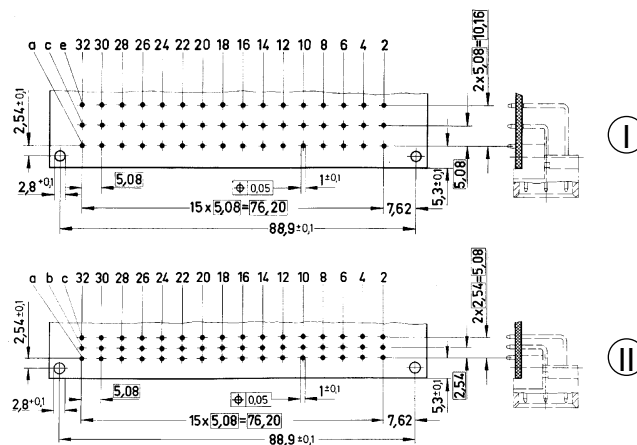
Identification	Number of contacts	Contact arrangement	Part No. 3	Performance levels according to IEC 60 603-2. 2	1	
Male connector with angled solder pins Row separation termination side 5.08 mm (I) Row separation termination side 2.54 mm (II) SMC	48		09 05 148 7921	09 05 148 6921 09 05 148 6921 222^{f)} 09 05 348 6921 ^{b)} 09 05 648 6921 ^{c)}	09 05 148 2921 09 05 148 2921 222^{f)}	
	46 + 2 [▲]			09 05 148 6951	09 05 648 2921 ^{c)}	
	48		09 05 148 7931	09 05 148 6931	09 05 148 2931	
	48				09 05 148 6920^{d)}	
	46 + 2 [▲]				09 05 148 6961	

Dimensions



Board drillings

Mounting side



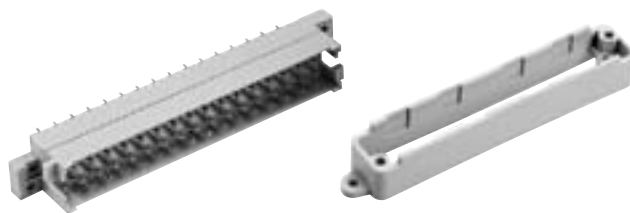
Dimensions in mm

[▲] Male connectors with 2 leading contacts [(0.8 mm) pos. a2 and a32]
Other contact arrangements on request
^{b)} Connectors with snap-in clips
^{c)} Connectors with coding

^{d)} CTI > 400
^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

Number of contacts

48, 32

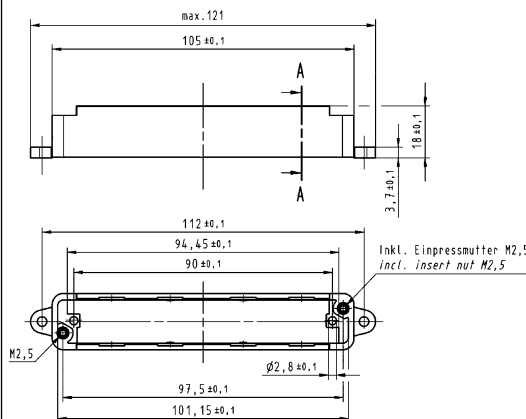


Interface connector I

Identification	Number of contacts	Contact arrangement	Part No.	Drawing	Dimensions in mm
----------------	--------------------	---------------------	----------	---------	------------------

Shroud¹⁾
 for screw-fixing of shell housing D20 plastic or D20 metallised .
 The shroud is assembled onto the Interface connector I and is screwfixed onto the pcb or to the rack.

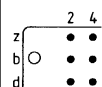
09 06 001 9964



Interface connector I with solder pins¹⁾
 0.6 x 0.6 mm

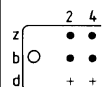
Performance level 1*

48



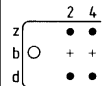
09 06 048 2905^{f)}

32



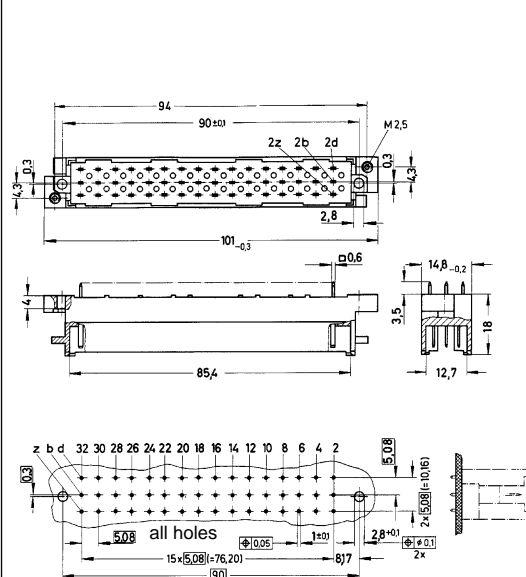
09 06 032 2905^{f)}

32



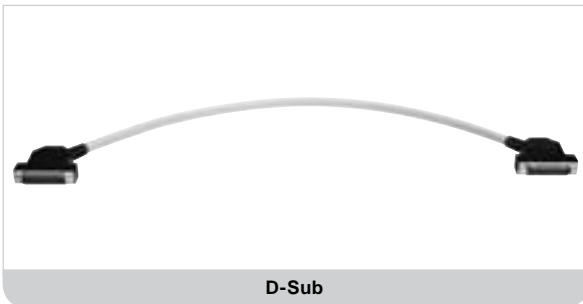
09 06 032 2941^{f)}

Board drillings
 Mounting side



* Acc. to IEC 60 603-2, performance level 2 on request
¹⁾ With shroud coding
^{f)} Railway classification NFF 16-101, Smoke index: F1, Flammability class: I2

The cabling represents the backbone of an application. Mistakes during the selection and laying of cables may lead to serious errors in data transfer, data loss and even total network failure. Especially in the industrial environment, reliable and fully functional cables are an



D-Sub

important element in planning and implementing high-performance networks ensuring a high degree of availability.

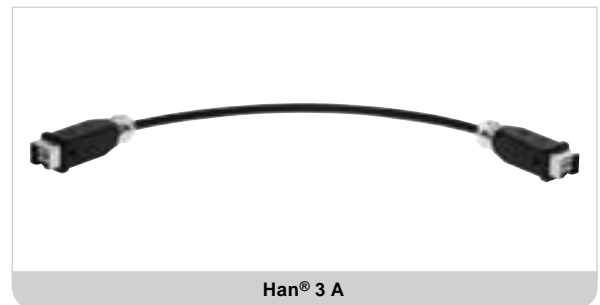
HARTING offers a wide range of cable assemblies, which are specially designed for use in different environment. Data transfer in the Categories 5, 6 and 7 according to ISO/IEC 11801 is supported.

Additionally options like solid, stranded, or trailing cable are provided. Oil resistance, high mechanical stability and halogen-free are only a few of the features HARTING demands from on its cables.

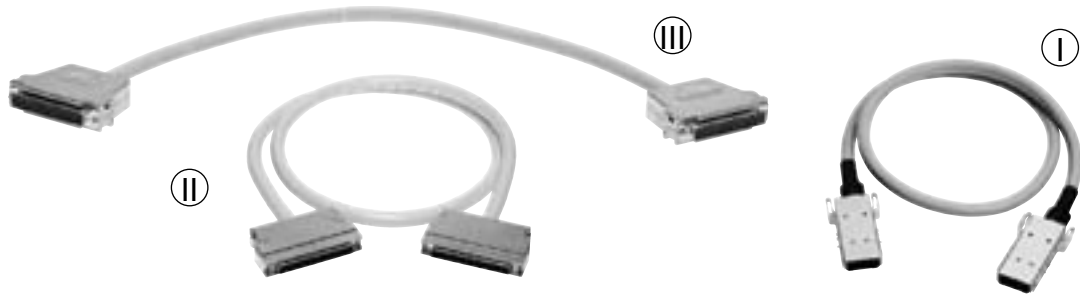
The range of HARTING cable assemblies uses these upscale cables combined with high-grade connectors. All of them use different types of connectors like har-mik®, har-link®, HARTING PushPull, fibre optic and many more.

All HARTING cable assemblies provide an optimized electrical and mechanical support. Since these products are tested 100 % a stable quality on a high level can be assured. Without having any assembly work the application can “play” by “unpacking and plug”, so that “plug and play” becomes reality.

By covering various lengths and supporting customized solutions, including overmoulding, a wide range of applications can be served. For the overmoulding solutions we offer different materials like PVC, PUR and more. The overmoulding solution can be used with inner shielding or without. HARTING offers both standard cable assemblies and customer specific versions for small and high volumes!



Han® 3 A



Identification	Part No.	Drawing	Dimensions [mm]
<p>High end cable assembly har-link® 10 pole</p> <p>Cable: 5 twisted pairs, AWG 30, double shielded, PVC</p> <p>Wiring: 1:1</p> <p>Ⓚ</p> <p>Length: L = 0.5 m L = 1.0 m L = 2.0 m</p>	<p>33 27 243 0500 006 33 27 243 1000 007 33 27 243 2000 008</p>	<p>12 First mate pin har-link male IDC connector</p>	
<p>Cable assembly har-mik® pin and socket, 68 pole</p> <p>Hood: metal hood with top entry</p> <p>Cable: 34 twisted pairs, AWG 28, shielded, PVC</p> <p>Wiring: 1:1</p> <p>Ⓛ</p> <p>Length: L = 0.5 m L = 1.0 m L = 2.0 m L = 5.0 m L = 10.0 m L = 15.0 m L = 20.0 m</p>	<p>33 60 214 5000 102 33 60 213 1000 103 33 60 213 2000 104 33 60 213 5000 105 33 60 212 1000 106 33 60 212 1500 107 33 60 212 2000 108</p>		
<p>Cable assembly D-Sub HD 78 pole</p> <p>Hood: shielded plastic hood with side entry, screw 4-40 UNC</p> <p>Cable: 39 twisted pairs, AWG 26, double shielded, PVC</p> <p>Wiring: 1:1</p> <p>Ⓜ</p> <p>Length: L = 0.5 m L = 1.0 m L = 2.0 m L = 5.0 m L = 10.0 m L = 20.0 m</p>	<p>33 56 212 0050 028 33 56 213 1000 002 33 56 213 2000 016 33 56 212 0500 029 33 56 212 1000 030 33 56 212 2000 031</p>		



Identification	Part No.	Drawing	Dimensions [mm]
----------------	----------	---------	-----------------

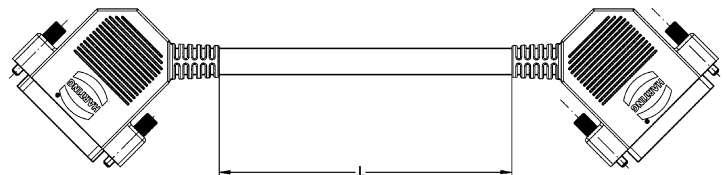
**Cable assembly D-Sub HD
44 pole**

Hood: overmoulded
with side entry
Cable: 24 twisted pairs, solid
wires, AWG 26, shielded,
halogen free
Wiring: 1:1

Ⓛ

Length: L = 0.5 m
L = 1.0 m
L = 2.0 m
L = 5.0 m

33 56 224 5000 001
33 56 221 0010 001
33 56 221 0020 001
33 56 221 0050 001



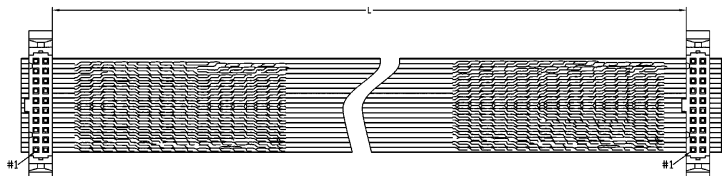
**Cable assembly SEK
20 pole**

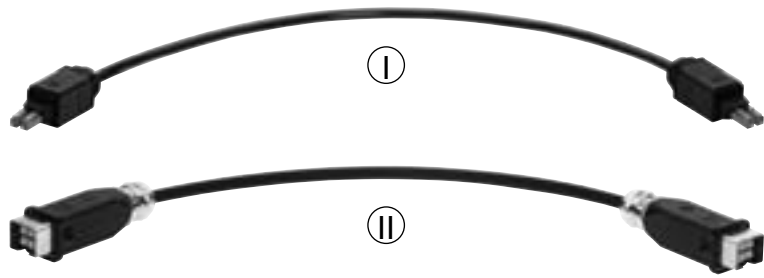
Cable: Flat cable,
10 twisted pairs, AWG 28/7,
1.27 mm pitch
Wiring: 1:1

Ⓜ

Length: L = 0.5 m
L = 1.0 m
L = 1.5 m

33 18 243 0500 060
33 18 243 1000 062
33 18 243 1500 068





Identification

Part No.

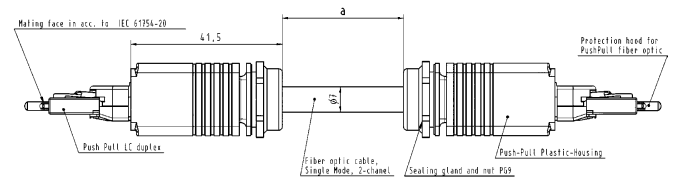
Drawing

Dimensions in mm

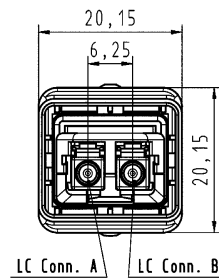
Fibre optic cable, double ended, single mode
2 x HARTING PushPull LC duplex

- Length: a = 1 m
a = 5 m
a = 10 m
I a = 20 m
a = 40 m
a = 50 m
a = 100 m

- 33 58 211 0010 002
33 58 211 0050 002
33 58 211 0100 002
33 58 211 0200 002
33 58 211 0400 002
33 58 211 0500 002
33 58 211 1000 002



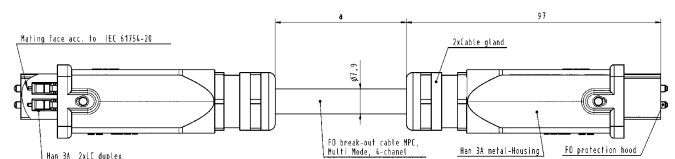
a = length



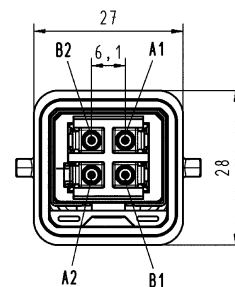
Fibre optic cable, double ended, multi mode, metal, 50 µm
2 x Han® 3 A, 2 x LC duplex

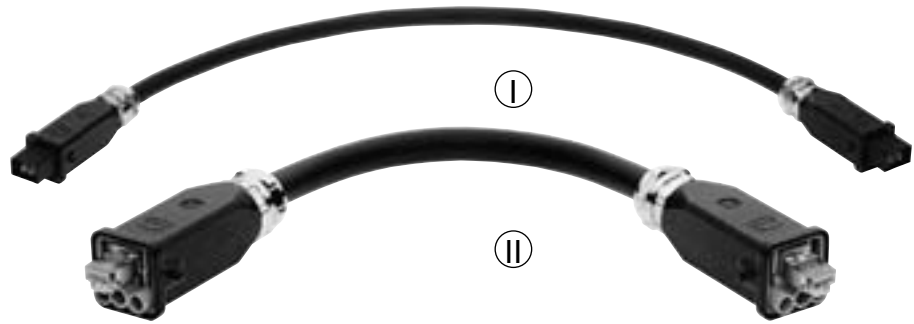
- Length: a = 1 m
a = 5 m
a = 10 m
II a = 20 m
a = 40 m
a = 50 m
a = 100 m

- 33 54 211 0010 002
33 54 211 0050 002
33 54 211 0100 002
33 54 211 0200 002
33 54 211 0400 002
33 54 211 0500 002
33 54 211 1000 002



a = length





Identification

Part No.

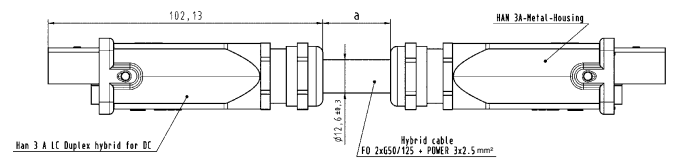
Drawing

Dimensions in mm

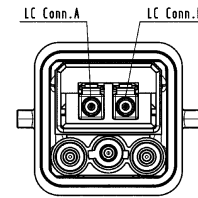
Hybrid fibre optic cable,
multi mode, double ended,
LC duplex
2 x G50/125 + 3 x 2.5 mm²

- Length: a = 1 m AC version
DC version
- a = 5 m AC version
DC version
- I** a = 10 m AC version
DC version
- a = 20 m AC version
DC version
- a = 40 m AC version
DC version
- a = 50 m AC version
DC version
- a = 100 m AC version
DC version

- 33 57 211 0015 001
33 57 211 0015 002
- 33 57 211 0055 001
33 57 211 0055 002
- 33 57 211 0105 001
33 57 211 0105 002
- 33 57 211 0205 001
33 57 211 0205 002
- 33 57 211 0405 001
33 57 211 0405 002
- 33 57 211 0505 001
33 57 211 0505 002
- 33 57 211 1005 001
33 57 211 1005 002



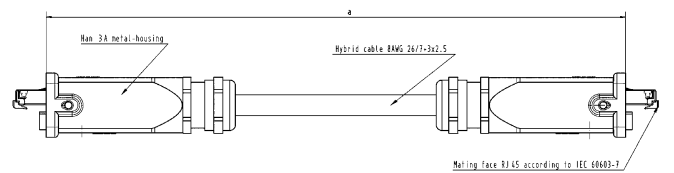
a = length



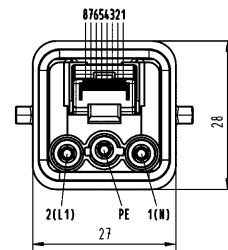
Hybrid cable, double ended,
4 x 2 x AWG 26/7 + 3 x 2.5 mm²

- Length: a = 1 m AC version
DC version
- a = 5 m AC version
DC version
- II** a = 10 m AC version
DC version
- a = 20 m AC version
DC version

- 33 57 211 0010 001
33 57 211 0010 002
- 33 57 211 0050 001
33 57 211 0050 002
- 33 57 211 0100 001
33 57 211 0100 002
- 33 57 211 0200 001
33 57 211 0200 002



a = length

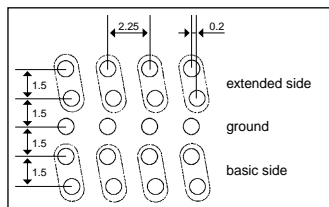


Technical characteristics

Design according	PICMG MTCA.0 R1.0 (RoHS compliance)
Number of contacts	170
Contact spacing	0.75 mm
Clearance and creepage distance between contacts	0.1 mm min.
Working current of power contacts as defined in MTCA.0 spec.	~ 2.3 A @ 70 °C max. 30 °C temp. rise (PICMG requirement min. 1.52 A)
Test voltage	80 V _{r.m.s.}
Working voltage typically	3.3 V; 5.0 V; 12.0 V
Initial contact resistance	25 mΩ max.
Initial insulation resistance	100 MΩ min.

Nominal differential impedance	100 Ω±10 %
--------------------------------	------------

Max. NEXT @ 25 ps risetime	Bottom route
Adjacent	0.65 %
Basic-to-extended (diagonal)	0.60 %
Basic-to-extended (opposite)	0.73 %
Multiline (five multi-aggressor differential pairs)	2.88 % max.



PCB library on request
(PADS/Dx-Designer)

SPICE models and
S-Parameter on request

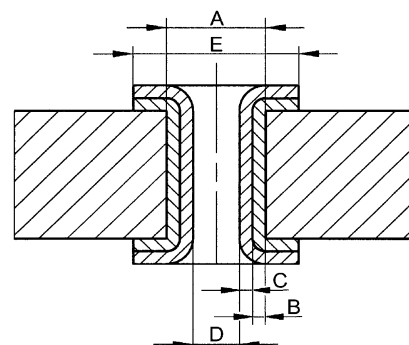
Differential propagation delay	Basic side: 70 ps ± 5 ps Extended side: 70 ps ± 5 ps
Differential skew	Between basic and extended side: ±2 ps Within basic and extended side: ±2 ps

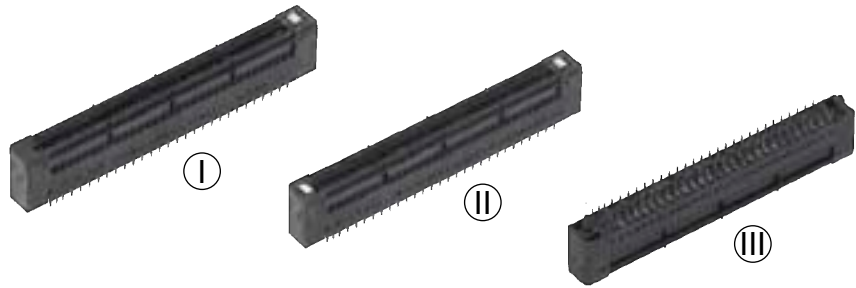
Temperature range	-55 °C ... +105 °C
Durability as per MTCA.0 spec.	200 mating cycles
Termination technique	Press-in termination
Mating force	100 N max., typically 60 - 80 N (depending on AdvancedMC™)
Withdrawal force	65 N max., typically 40 - 60 N (depending on AdvancedMC™)

Materials	
Moulded parts	Liquid Crystal Polymer (LCP), UL 94-V0
Contacts	Copper Alloy
Contact surface	Pd/Ni with Au flash Au over Ni on request
Packaging	Cardboard box (other packaging on request)

Recommended plated through hole specification			
	A	Drill hole-Ø	0.64±0.01 mm
	B	Cu	25 - 35 µm
Tin plated PCB (HAL)	C	Sn	5 - 15 µm
	D	Hole-Ø	0.53 - 0.60 mm
Au / Ni plated PCB	C	Ni	3 - 7 µm
		Au	0.05 - 0.12 µm
	D	Hole-Ø	0.55 - 0.60 mm
Chemical tin plated PCB	C	Sn	0.8 - 1.5 µm
	D	Hole-Ø	0.56 - 0.60 mm
Silver plated PCB	C	Ag	0.1 - 0.3 µm
	D	Hole-Ø	0.56 - 0.60 mm
OSP copper plated PCB	C	---	---
	D	Hole-Ø	0.56 - 0.60 mm
	E	Pad size	min. 0.95 mm

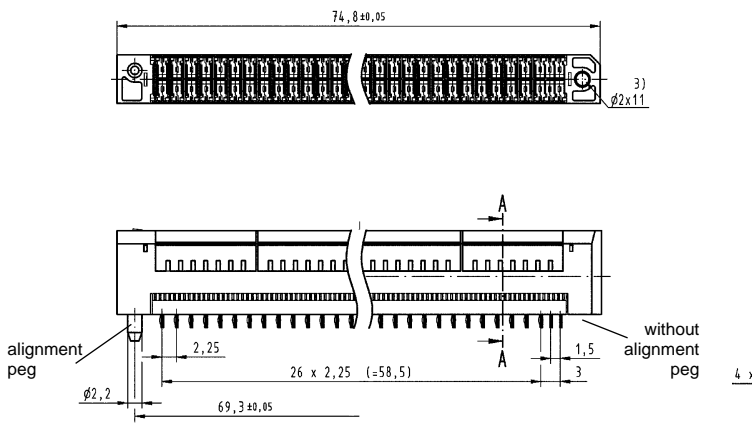
The press-in zone of the AdvancedMC™ connector is tested according to Telcordia/Bellcore GR 1217CORE Part7. It is approved to be used with a plated through hole according to IEC 60352-5 with a diameter of 0.55±0.05 mm (drilled hole 0.64±0.01 mm). Based on our experiences regarding the production process of the PCB manufacturer we recommend a plated through hole configuration like shown in the above spreadsheet. To achieve the recommended plated through hole diameter, it is important to specify especially the drilled hole diameter of 0.64±0.01 mm to your PCB supplier. For drillings use e.g. drill bit # 72 (0.025" ≈ 0.64 mm).





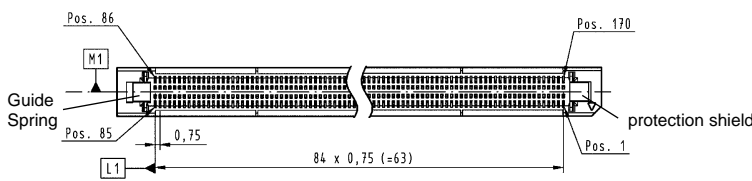
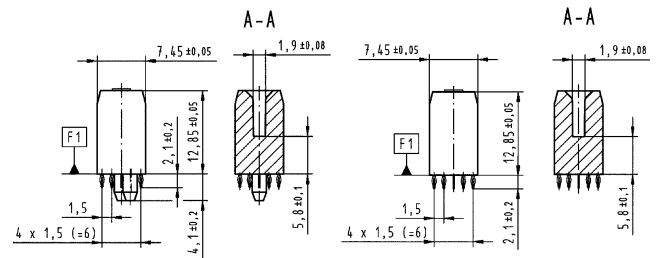
Card edge connectors, straight

Identification	No. of contacts	Contact length [mm]		Part number
			termination side	
AdvancedMC™ connectors for MicroTCA™ with GuideSpring ①	170	2.1		16 11 170 5202 000
with GuideSpring and protection shield ②	170	2.1		16 11 170 5205 000
with GuideSpring and alignment peg ③	170	2.1		16 11 170 5206 000
with GuideSpring, protection shield and alignment peg	170	2.1		16 11 170 5207 000



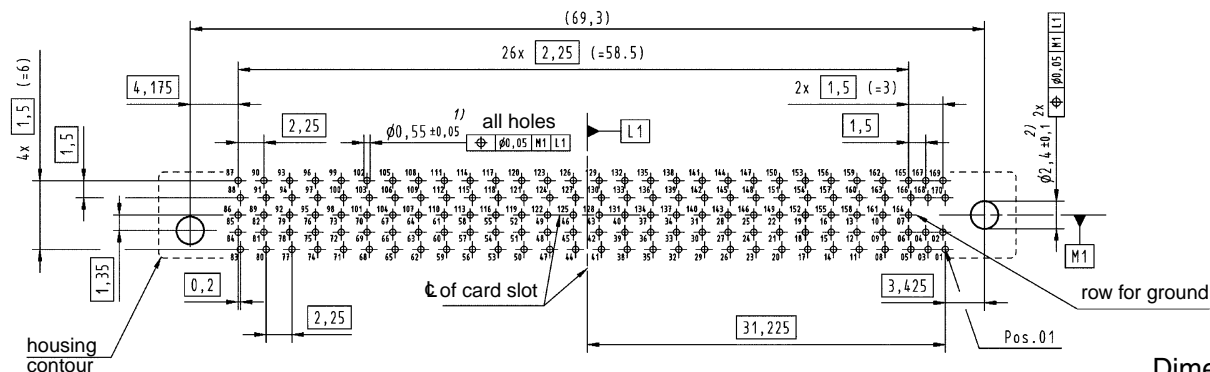
with alignment peg

without alignment peg



- 1) recommended plated through hole specification see page 140
- 2) non-metallized drillings
optional: for part numbers 16 11 170 5202 000 and 16 11 170 5205 000
mandatory: for part numbers 16 11 170 5206 000 and 16 11 170 5207 000
- 3) for optional fixing: use self-tapping screws for plastic, 2.2 x length (length = PCB thickness + min. 6.5 mm to max. 10 mm)
e.g. HARTING part number 09 06 001 9974
Screwing torque references:
PCB + 6.5 mm: 20 cNm
PCB + 10 mm: 40 cNm

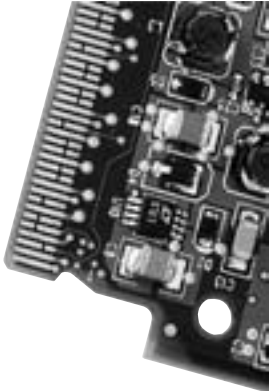
Board drillings (view magnified)



Dimensions [mm]

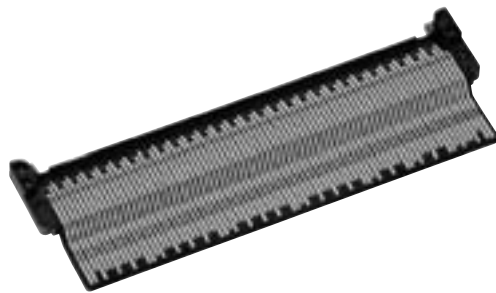
The PICMG specification AMC.0 defined a card edge with gold pads as the mating interface for the AdvancedMC™ module.

As already explained in the chapter “con:card+”, it is very difficult for a PCB manufacturer to produce the tight tolerances required for the AdvancedMC™ module card edge in a consistent process. Furthermore, the quality of the gold pads is only specified in general terms.



Replacing the PCB gold pads with a connector eliminates certain drawbacks of the card edge connection. The HARTING Plug Connector offers the following advantages:

- **Controlled quality of both mating sides**
- **Small dimensional tolerances**
- **Defined hard gold surface**
- **Reduced mating forces**
- **Allows use of thicker PCBs**
- **Standard reflow solder process**
- **Cost savings are possible**



Controlled quality of both mating sides

The major advantage is that a solid contact with a band plated surface mates with the backplane connector. The connection is no longer made directly from the card edge to the backplane connector but instead indirectly via a module connector approved from one source. The AdvancedMC™ module with a Plug Connector is still within the dimensional range of the PICMG AMC.0 specification and is fully mating compatible with AdvancedMC™ card edge connectors. Consequently the Plug Connector can be used in both MicroTCA™ and ATCA® environments.

Small dimensional tolerances

The injection moulding process is much more precise than the PCB production process. While the AMC.0 specification defines a PCB width tolerance of 0.1 mm,

the moulding process has a dimensional tolerance less than 0.03 mm. The lead-in chamfer is milled for the PCB but is realized in the connector as a smooth moulded plastic chamfer. Compared with the rough surface of a PCB chamfer with exposed glass fibre, the smooth Plug chamfer avoids abrasion of the backplane connector contact surface.

Defined hard gold surface

The AMC.0 specification defines hard gold to be on the PCB pads. However a common and unique definition of hard gold does not exist today. Additionally, the interruptions of the gold pads (which are necessary for the hot-swap ability) require a selective hard gold process. This is a complex process which is relatively expensive, so commonly just chemical gold with insufficient surface thickness is used. As a result, there are significant differences in the durability of the gold and the surface structure on the modules which are currently available.

The contacts of the HARTING AdvancedMC™ Plug Connector are plated all-around and are manufactured in a defined band plating process with controlled quality. There are different performance levels possible as the noble finish thickness can be adapted easily to meet customer demands.

Reduced mating forces

For the module card edge, the prepads of lagging contacts are required by the Telcordia/Bellcore specification to avoid stress of the connector contact when sliding on the FR4 base material. The Plug Connector does not need prepads. The four mating steps are realized with true lagging contacts. The sophisticated design of the insulator reduces the mating forces of the module significantly.



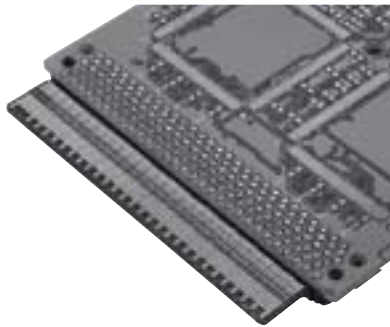
Allows use of thicker PCBs

By using a HARTING AdvancedMC™ Plug Connector, the mating interface of the module is defined by the connector instead of the PCB. This fact leads to clear advantages and provides a wider scope for the module development. The restriction of the PCB thickness of 1.6 mm +/-10% is no longer a limiting factor. A PCB

thickness of e.g. 2 mm can be used as this fits in the mechanical environment.

Standard reflow solder process

For backplanes press-fit termination is the first choice, however solder termination offers advantages for module cards. The Plug Connector is mounted to the



PCB through “pin-in-hole-reflow” solder technology (PIHR). It can be soldered in the same production process as the other semi finished components on the AdvancedMC™ module. Optionally, the Plug Connector

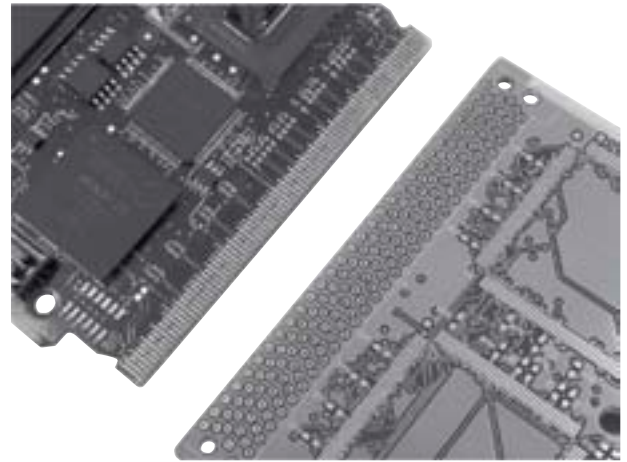
can be delivered with a pick-and-place-pad for automatic assembly.

Another advantage of this mechanically stable technology is, that the connector can be replaced. This can avoid the cost of scrapping a module if the mating interface is damaged during handling.

Cost savings are possible

By offering so many different advantages during the manufacturing process, the use of HARTING Plug Connectors also contributes to keeping costs down. Selective plating increases the cost of producing gold

pads. Tight tolerance specifications also cause a large number of rejects. The beveled PCB edge is another critical area, because damage can occur to the contact pads.



A simple board layout with through-holes is sufficient for the HARTING Plug, and these boards can be produced inexpensively and with excellent quality control, thus reducing the number of rejects. Furthermore the cost of a reject can be high if a defective PCB edge is not detected until the board is populated with expensive components. A HARTING Plug on a module can be replaced easily, reducing scrapping costs.

Mounting direction

The HARTING Plug Connector is available in two versions. The difference is the mounting direction, i. e. the side of the AdvancedMC™ module PCB on which the Plug Connector is assembled.

Basic side

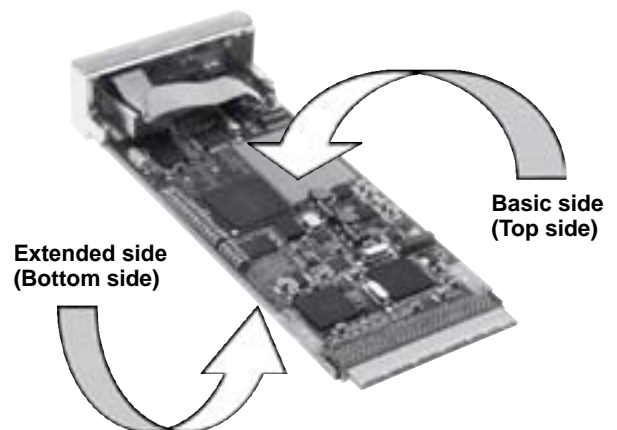
The so called basic side refers to the component side 1 as defined in the AMC.0 specification (pins 1 to 85). The main components are mounted on the basic side (sometimes also called top side).

During the manufacturing process, a Plug Connector that is mounted from the basic side can be soldered in the same assembly step as the other large components.

Extended side

The so called extended side refers to the component side 2 as defined in the AMC.0 specification (pins 86 to 170).

A Plug Connector mounted on the extended side is “hanging” at the bottom side of the AdvancedMC™ module.



This picture shows an AdvancedMC™ module with a Plug Connector mounted on the extended side.

The footprint of a Plug Connector for the basic side is different than that for the extended side. The connectors are not interchangeable. Due to advantages in the assembly of the connector, the basic side version is preferable.

For an MCH stack, only connectors having the same mounting direction can be stacked.

Design according to PICMG MicroTCA.0 R1.0
PICMG AMC.0 R2.0
(RoHS compliance)

Number of contacts: 170
Contact spacing: 0.75 mm
Clearance and creepage distance between contacts: 0.1 mm min.

Working current of power contacts as defined in AMC.0 spec., tested with HARTING MicroTCA™ backplane connector: ~ 2.4 A @ 70 °C max. 30 °C temp. rise (PICMG requirement min. 1.52 A)

Test voltage: 80 V_{r.m.s.}
Working voltage typically: 3.3 V; 5.0 V; 12.0 V

Initial contact resistance: 25 mΩ max.
Initial insulation resistance: 100 MΩ min.

Nominal differential impedance: 100 Ω ± 10 %

Max. crosstalk @ 25 ps risetime	Bottom route
Adjacent	0.5 %
Basic-to-extended (diagonal)	0.2 %
Basic-to-extended (opposite)	0.7 %
Multiline (five multi-aggressor differential pairs)	2.1 % max.

Propagation delay:
Long contact side: 152 ps / 147 ps
Short contact side: 121 ps / 129 ps

Skew within differential pairs:
Long contact side: 5 ps
Short contact side: 8 ps

Temperature range during reflow soldering: -55 °C ... +105 °C
220 °C for 2 minutes
270 °C max. short-term

Durability as per AMC.0 specification: 200 mating cycles in total

Termination technique: Solder termination (Pin in Hole Intrusive Reflow)

Pick-and-place-weight: < 7 g

Mating force: 100 N max., typically 40 - 70 N (depending on backplane connector)

Withdrawal force: 65 N max., typically 30 - 50 N (depending on backplane connector)

The mating and withdrawal force is highly depending on the mating half connector, but typically only 50 % to 70 % of the mating force of a PCB card edge.

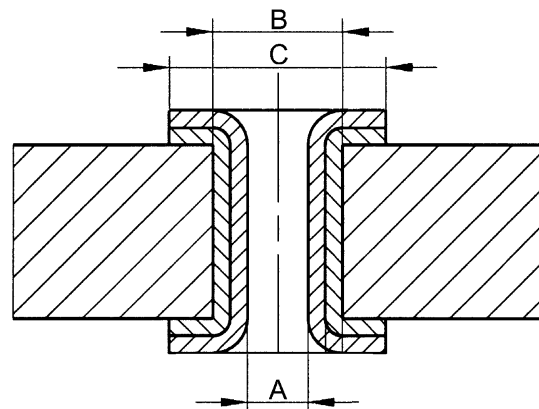
Materials

Moulded parts: Liquid Crystal Polymer (LCP), UL 94-V0

Contacts: Copper alloy

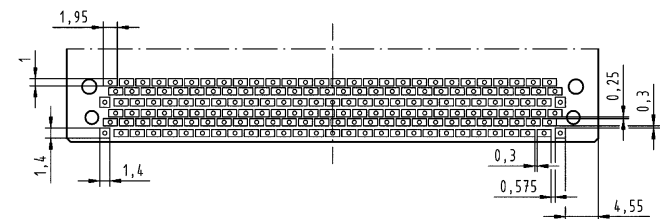
Contact surface: Au over Ni

Packaging: Tray packaging (other packaging on request)

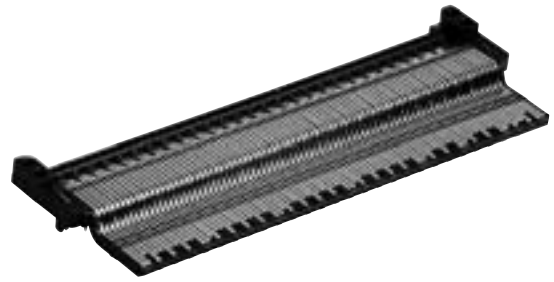


Plated through hole recommendations		
A	Plated hole-Ø	0.55±0.05 mm
B	Drill hole-Ø	0.65±0.01 mm
C	Pad size	0.95 mm

Stencil recommendation



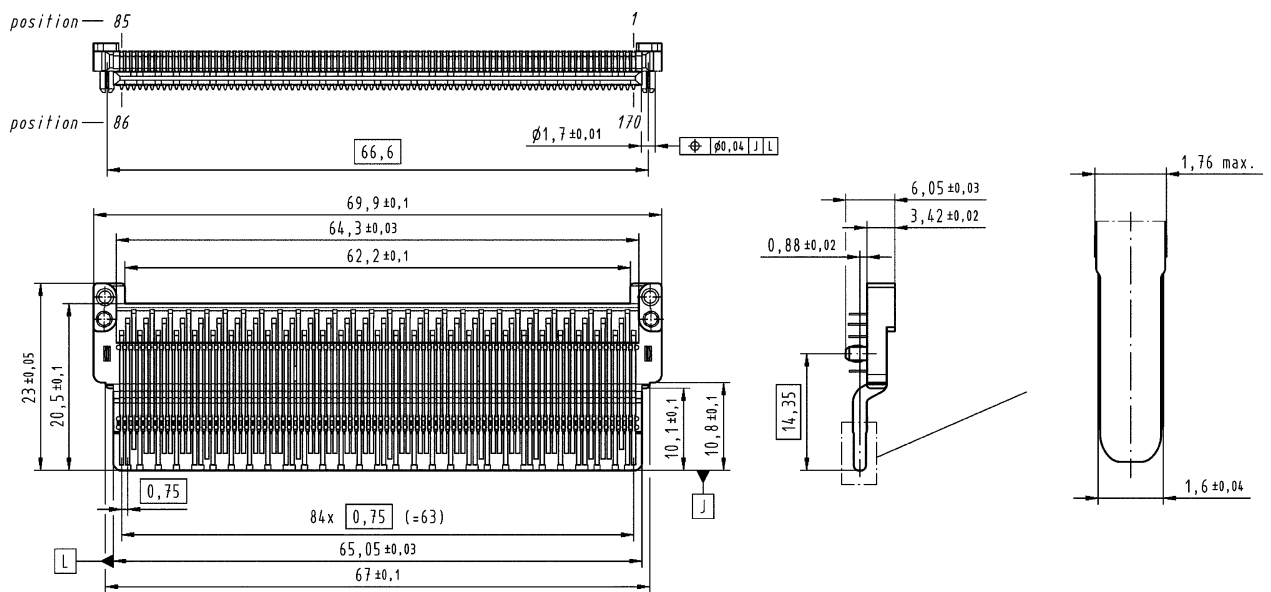
Each termination requires a solder paste volume of 0.5 mm³. Since the stencil can only provide fractions of this volume (0.29 mm³ at 0.15 mm stencil thickness), the remaining solder paste must be pressed into the plated through hole. For a nominal AMC card (1.6 mm PCB thickness, 0.55 mm plated hole diameter) the paste must penetrate the hole by 0.9 mm.



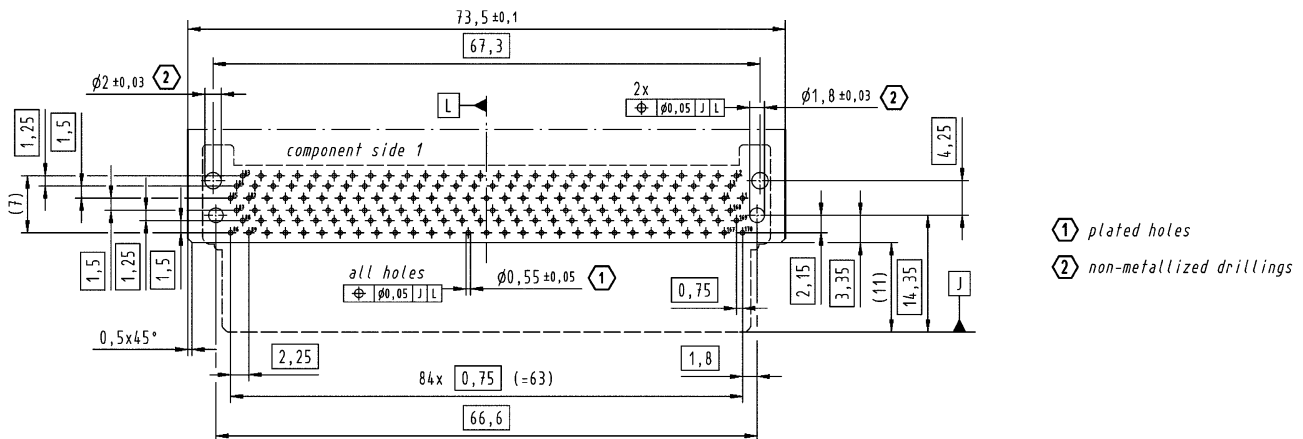
For mounting on basic side

Identification	No. of contacts	Part number
AdvancedMC™ Plug Connector for basic side mounting	170	16 23 170 1301 000
AdvancedMC™ Plug Connector for basic side mounting with nozzle pad for pick and place assembly	170	16 23 170 1302 000

AdvancedMC™ Plug Connector for basic side mounting

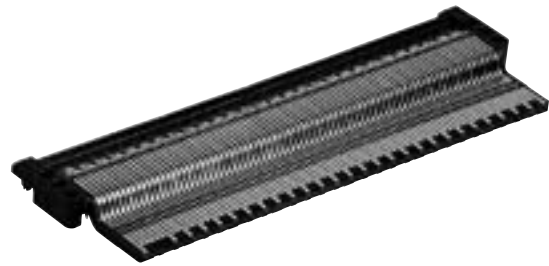


Board drillings (view of the basic side / component side 1)



Dimensions [mm]

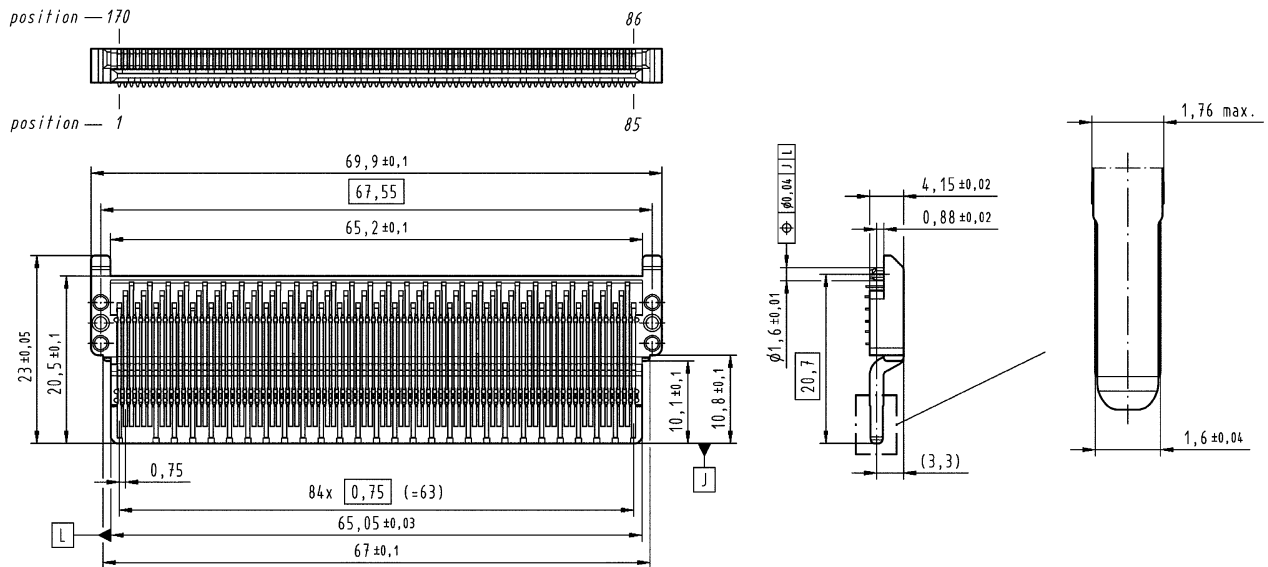
Plug Connector for AdvancedMC™ modules



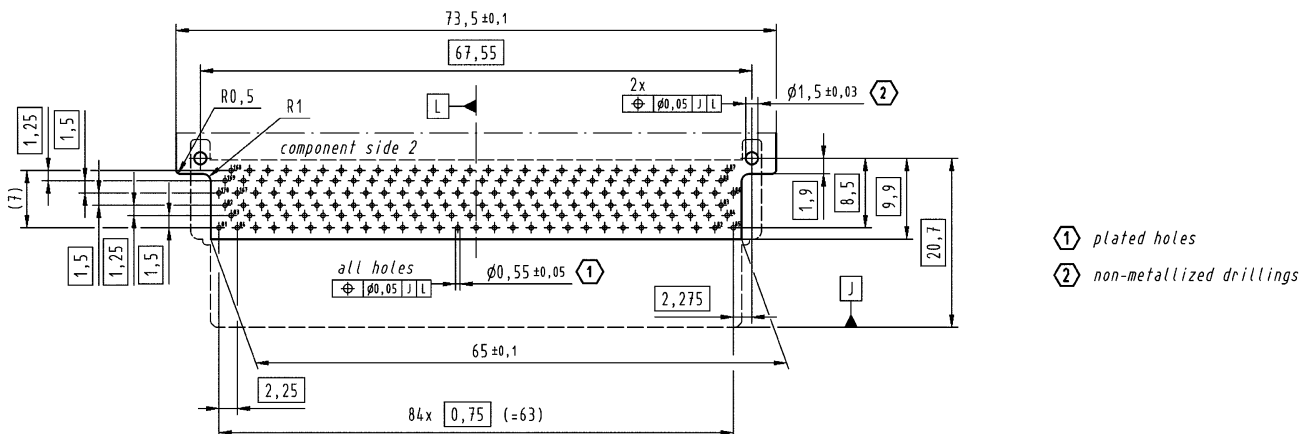
For mounting on extended side

Identification	No. of contacts	Part number
AdvancedMC™ Plug Connector for extended side mounting replacement of former part number 16 21 170 1301 000	170	16 21 170 1303 000
AdvancedMC™ Plug Connector for extended side mounting with nozzle pad for pick and place assembly replacement of former part number 16 21 170 1302 000	170	16 21 170 1304 000

AdvancedMC™ Plug Connector for extended side mounting



Board drillings (view of the extended side / component side 2)



Dimensions [mm]

An important component of a MicroTCA™ system is the “MicroTCA™ Carrier Hub”, abbreviated MCH. The main functions of an MCH module are hardware platform management and the management of the fabric connectivity. Since the MCH module requires many more connections than a standard AdvancedMC™ module, an MCH may have up to 4 mating tongues each with 170 contacts.



The MTCA.0 specification recommends the use of a special Plug Connector to reduce the insertion force of the module and to solve the tolerance stack-up problem between the multiple tongues and the backplane connectors.

The HARTING Plug Connector system consists of three different Plug Connectors. The **AdvancedMC™ Plug** is required for an MCH module and is always used in the MCH1-slot. Furthermore it can be used for any conventional AdvancedMC™ module to replace the pcb gold pads.



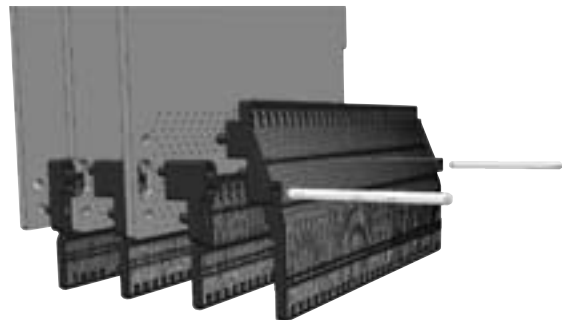
AdvancedMC™ Plug, MCH Plug, Piggyback Plug

If more than one mating tongue is needed, the **MCH Plug Connector** is mated with the backplane MCH connectors 2 and 3 depending on the MicroTCA™

configuration. Compared to the AdvancedMC™ Plug, the MCH Plug insulator has standoffs ensuring the correct distance for the slot width between two tongues or backplane connectors respectively. The MCH and AdvancedMC™ Plugs have different contact staggering on the basic side, the extended side is equal.

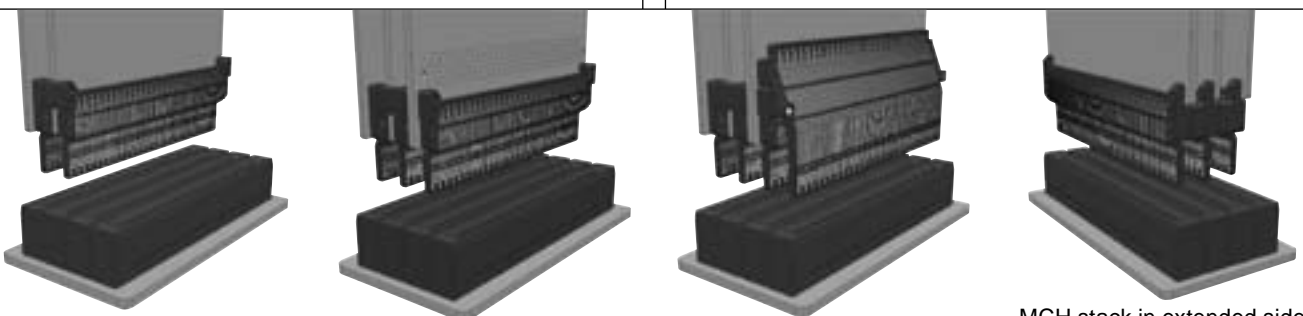
The **Piggyback Plug Connector** is designed for the MCH4 slot, but the connector itself is soldered on the PCB3. For a MicroTCA™ system with more than 6 AdvancedMC™ modules using the switched fabric fat pipe, an MCH module with 4 mating tongues must be used. In general the switched fabric is located only on the PCB3, so a high-speed connection is needed between the MCH4 slot and the PCB3.

To build a connector stack for two, three or four mating tongues, the HARTING Plug Connectors are mounted like building blocks via pegs and the holes on the adjacent Plugs. For additional mechanical stability, the connector stack is fixed using metal stacking pins. The complete connector stack can be installed easily without any special tooling.



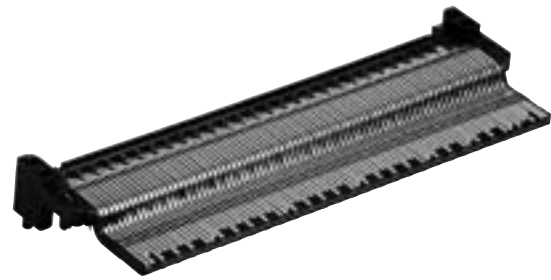
Exploded view of an MCH stack with four tongues including Piggyback Plug

As with the AdvancedMC™ Plug, HARTING offers the Plug Connectors for MCH modules in versions for basic side or extended side mounting. Only connectors with the same mounting direction can be stacked together. The Piggyback Plug is only available as basic side version, therefore for a MCH module with four tongues, the basic side version is preferred.



MCH stacks in basic side version with 2, 3 and 4 tongues

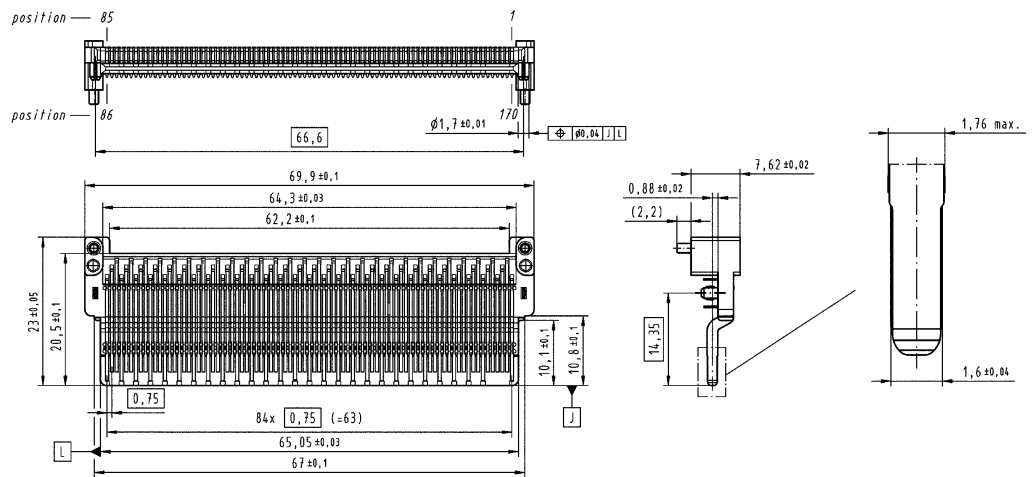
MCH stack in extended side version



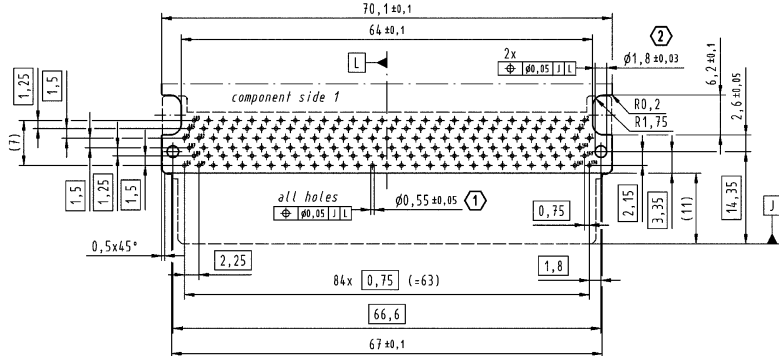
For mounting on basic side

Identification	No. of contacts	Part number
AdvancedMC™ Plug Connector for basic side mounting	170	16 23 170 1301 000
AdvancedMC™ Plug Connector for basic side mounting with nozzle pad for pick and place assembly	170	16 23 170 1302 000
MCH Plug Connector for basic side mounting	170	16 24 170 1301 000
MCH Plug Connector for basic side mounting with nozzle pad for pick and place assembly	170	16 24 170 1302 000
AdvancedMC™ – MCH Plug stacking-pin for basic side mounting		
double length (for two stacked plugs) 11 mm		16 79 000 0017 000
triple length (for three stacked plugs) 18.5 mm		16 79 000 0019 000
quad length (for four stacked plugs) 22.5 mm		16 79 000 0020 000

MCH Plug Connector
for basic side mounting



Board drillings
(view of the
basic side /
component side 1)



- ① plated holes
- ② non-metallized drillings

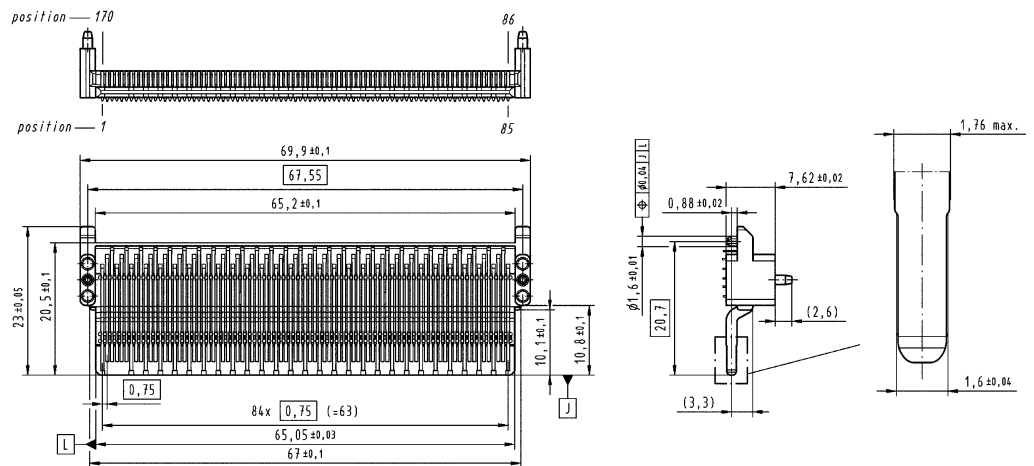
Dimensions [mm]



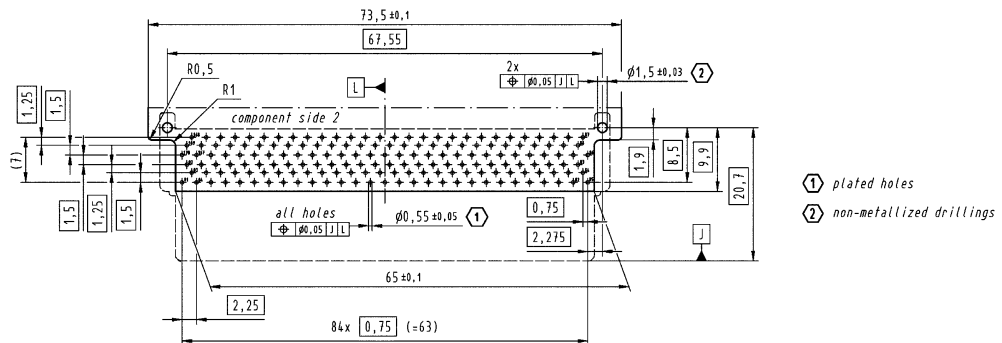
For mounting on extended side

Identification	No. of contacts	Part number
AdvancedMC™ Plug Connector for extended side mounting replacement of former part number 16 21 170 1301 000	170	16 21 170 1303 000
AdvancedMC™ Plug Connector for extended side mounting with nozzle pad for pick and place assembly replacement of former part number 16 21 170 1302 000	170	16 21 170 1304 000
MCH Plug Connector for extended side mounting replacement of former part number 16 22 170 1301 000	170	16 22 170 1303 000
MCH Plug Connector for extended side mounting with nozzle pad for pick and place assembly replacement of former part number 16 22 170 1302 000	170	16 22 170 1304 000
AdvancedMC™ – MCH Plug stacking-pin for extended side mounting		
double length (for two stacked plugs) 11.5 mm		16 79 000 0006 000
triple length (for three stacked plugs) 19 mm		16 79 000 0007 000
quad length (for four stacked plugs) 26.5 mm		16 79 000 0008 000

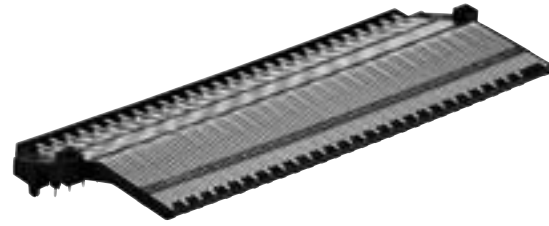
MCH Plug Connector for extended side mounting



Board drillings (view of the extended side / component side 2)

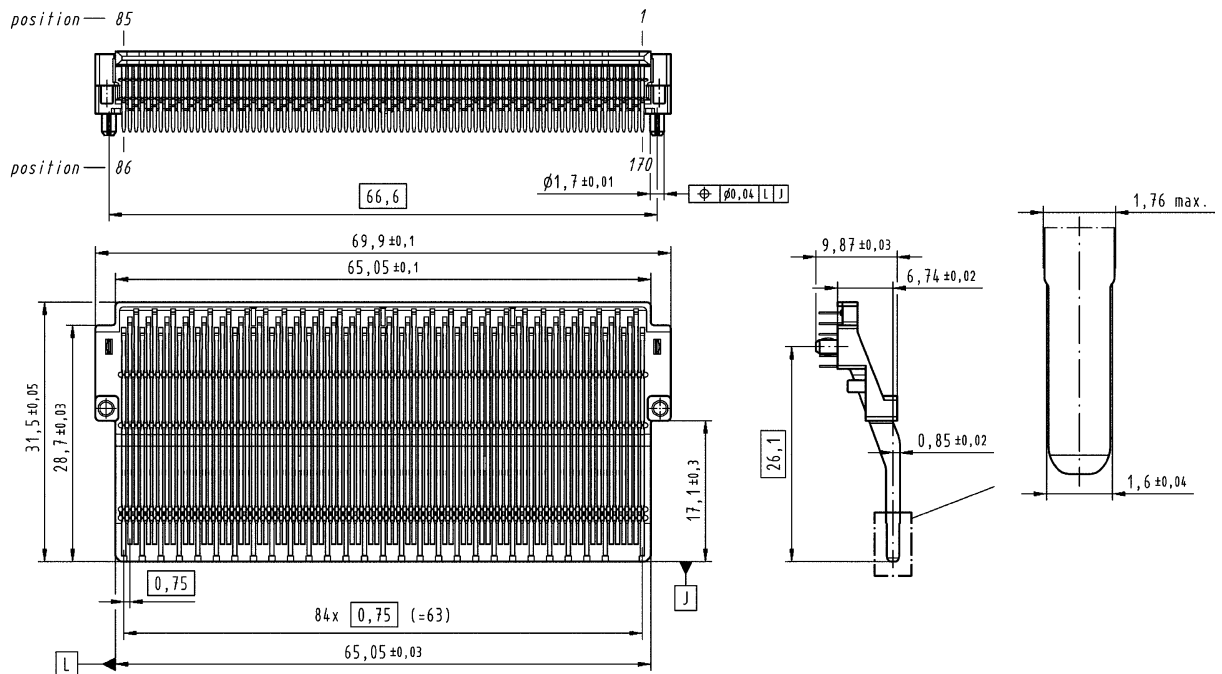


Dimensions [mm]

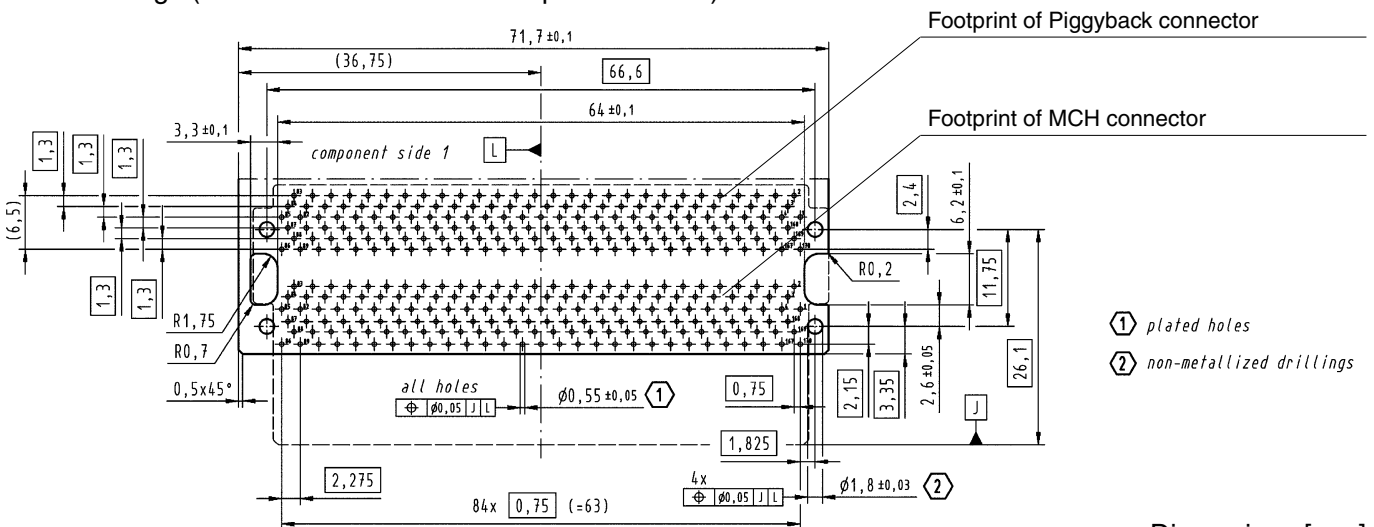


Identification	No. of contacts	Part number
MCH Piggyback Plug Connector applicable only in basic side mounting configuration	170	16 25 170 1301 000

MCH Piggyback Plug Connector





Board drillings (view of the basic side / component side 1)



Dimensions [mm]

Please send me further information:

CD-ROM HARKIS® basic 
DVD HARKIS® basic 



Interface Connectors



Outdoor Solutions



Industrial Connectors Han®



Connectors
DIN 41612



Ethernet
Network Solutions



Coaxial and Metric
Connectors



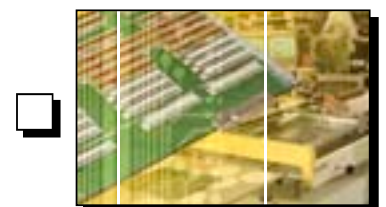
Application
brochure



TCA Connectors



Device Connectivity



Backplanes and
Integrated Systems

Sender:

Company: _____

Street: _____

Department: _____

Postcode/Town: _____

Name: _____

Country: _____

Prenome: _____

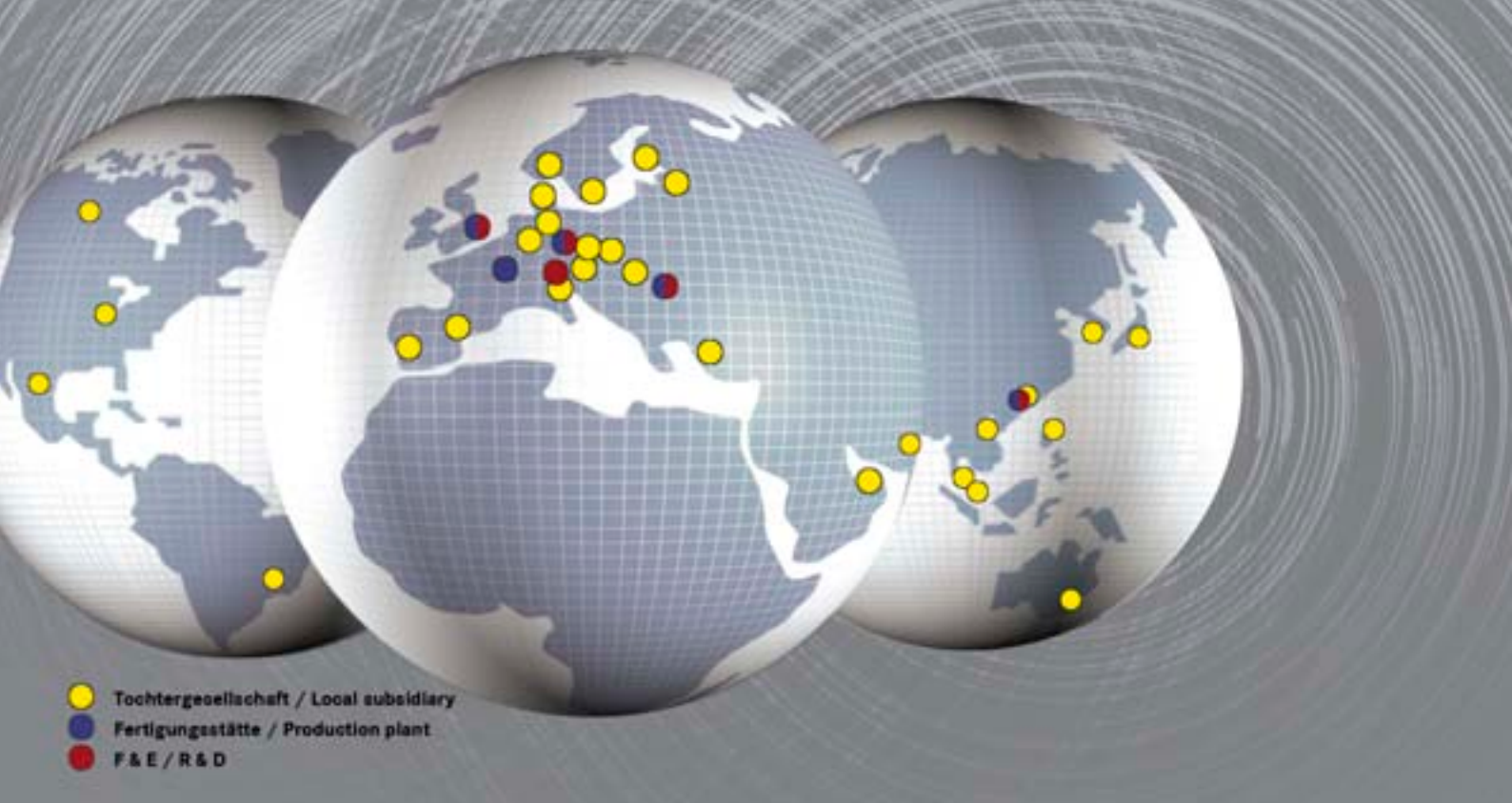
Phone: _____

Function: _____

Fax: _____

E-Mail: _____

Please send it by post or fax to your local HARTING representatives (see page addresses) or visit us 152 under www.HARTING.com.



Sales Network – worldwide



Albania

see Eastern Europe

Argentina

see Brazil

Armenia

see Eastern Europe

Australia

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

Austria

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

Azerbaijan

see Eastern Europe

Belarus

see Eastern Europe

Belgium

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

Bosnia and Herzegovina

see Eastern Europe

Brazil

HARTING Ltda.
Av. Dr. Lino de Moraes
Pq. Jabaquara, 255
CEP 04360-001 – São Paulo –
SP – Brazil
Phone +55 11 5035 0073
Fax +55 11 5034 4743
br@HARTING.com
www.HARTING.com.br

Brunei

see Singapore

Bulgaria

see Eastern Europe

Canada

see USA

China

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

Croatia

see Eastern Europe

Czech Republic

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

Denmark

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

Eastern Europe

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

Estonia

see Eastern Europe

Finland

HARTING Oy
Teknobulevardi 3-5, PL 35
FI-01530 Vantaa
Phone +358 9 350 87 300
Fax +358 9 350 87 320
fi@HARTING.com
www.HARTING.fi

France

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

Germany

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

Germany (Office)

HARTING Deutschland GmbH & Co. KG
Blankenauer Straße 99
D-09113 Chemnitz
Phone +49 0371 429211
Fax +49 0371 429222
de@HARTING.com
www.HARTING-Deutschland.de

Georgia

see Eastern Europe

Great Britain

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

Hong Kong

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

Hungary

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

Iceland – HARTING Electric

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

India

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

Indonesia

154 see Malaysia

Israel

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

Italy

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

Japan

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

Kazakhstan

see Eastern Europe

Kirghizia

see Eastern Europe

Korea (South)

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

Kosovo

see Eastern Europe

Latvia

see Eastern Europe

Lithuania

see Eastern Europe

Macedonia

see Eastern Europe

Malaysia (Office)

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

Montenegro

see Eastern Europe

Netherlands

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

New Zealand

see Australia

Norway

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

Philippines

see Malaysia

Poland

HARTING Polska Sp. z o. o
ul. Kamieńskiego 201-219
PL-51-126 Wrocław
Phone +48 71 352 81 71
Fax +48 71 320 74 44
pl@HARTING.com
www.HARTING.pl

Portugal

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

Republic of Moldova

see Eastern Europe

Romania

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

Russia

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

Serbia

see Eastern Europe

Singapore

HARTING Singapore Pte Ltd.
25 International Business Park
#02-06 German Centre
Singapore 609916
Phone +65 6225 5285
Fax +65 6225 9947
sg@HARTING.com
www.HARTING.com

Slovakia

HARTING s.r.o.
Sales office Slovakia
Povážska 2, SK - 940 67 Nové Zámky
Phone +421 356-493 993
Fax +421 356-402 114
sk@HARTING.com
www.HARTING.sk

Slovenia

see Eastern Europe

South Africa – HARTING Electric

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

South Africa – HARTING Electronics

Cabcon Technologies (PTY)Ltd
P.O. Box 13002, Northmead, 1511
Phone +27 1184533258
Fax +27 118454077
cabcon@mweb.co.za

Spain

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

Sweden

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

Switzerland

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

Taiwan

HARTING R.O.C. Limited
Room 1, 5/F
495 GuangFu South Road
RC-110 Taipei, Taiwan
Phone +886 227 586 177
Fax +886 227 587 177
tw@HARTING.com
www.HARTING.com.tw

Tajikistan

see Eastern Europe

Thailand

see Malaysia

Turkey

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

Turkmenistan

see Eastern Europe

Ukraine

see Eastern Europe

USA

HARTING Inc. of North America
1370 Bowes Road
USA-Elgin, Illinois 60123
Phone +1 (877) 741-1500 (toll free)
Fax +1 (866) 278-0307 (Inside Sales)
Fax +1 (847) 717-9430 (Sales and Marketing)

us@HARTING.com
www.HARTING-USA.com

Uzbekistan

see Eastern Europe

Vietnam (Office)

HARTING Singapore Pte Ltd
Hanoi Representative Office
Suite 518, 5th Floor
Press Club Building
59A Ly Thai To Street
Hoan Kiem District
Hanoi, Vietnam
Phone +84 4 / 3936 7851
Fax +84 4 / 3936 8069
sg@HARTING.com

Distributors – worldwide



Farnell:
www.farnell.com

RS Components:
www.rs-components.com

FUTURE Electronics:
www.futureelectronics.com

Other countries and general contact



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

HARTING Electronics GmbH & Co. KG
P.O. Box 1433, D-32328 Espelkamp
Phone +495772/47-97200
Fax +495772/47-777
electronics@HARTING.com

General information



It is the customer's responsibility to check whether the components illustrated in this catalogue comply with different regulations from those stated in special fields of application which we are unable to foresee.

We reserve the right to modify designs in order to improve quality, keep pace with technological advancement or meet particular requirements in production.

No part of this catalogue may be reproduced in any form (print, photocopy, microfilm or any other process) or processed, duplicated or distributed by means of electronic systems without the written permission of HARTING Electric GmbH & Co. KG or HARTING Electronics GmbH & Co. KG, Espelkamp. We are bound by the German version only.



Pushing Performance

www.HARTING.com