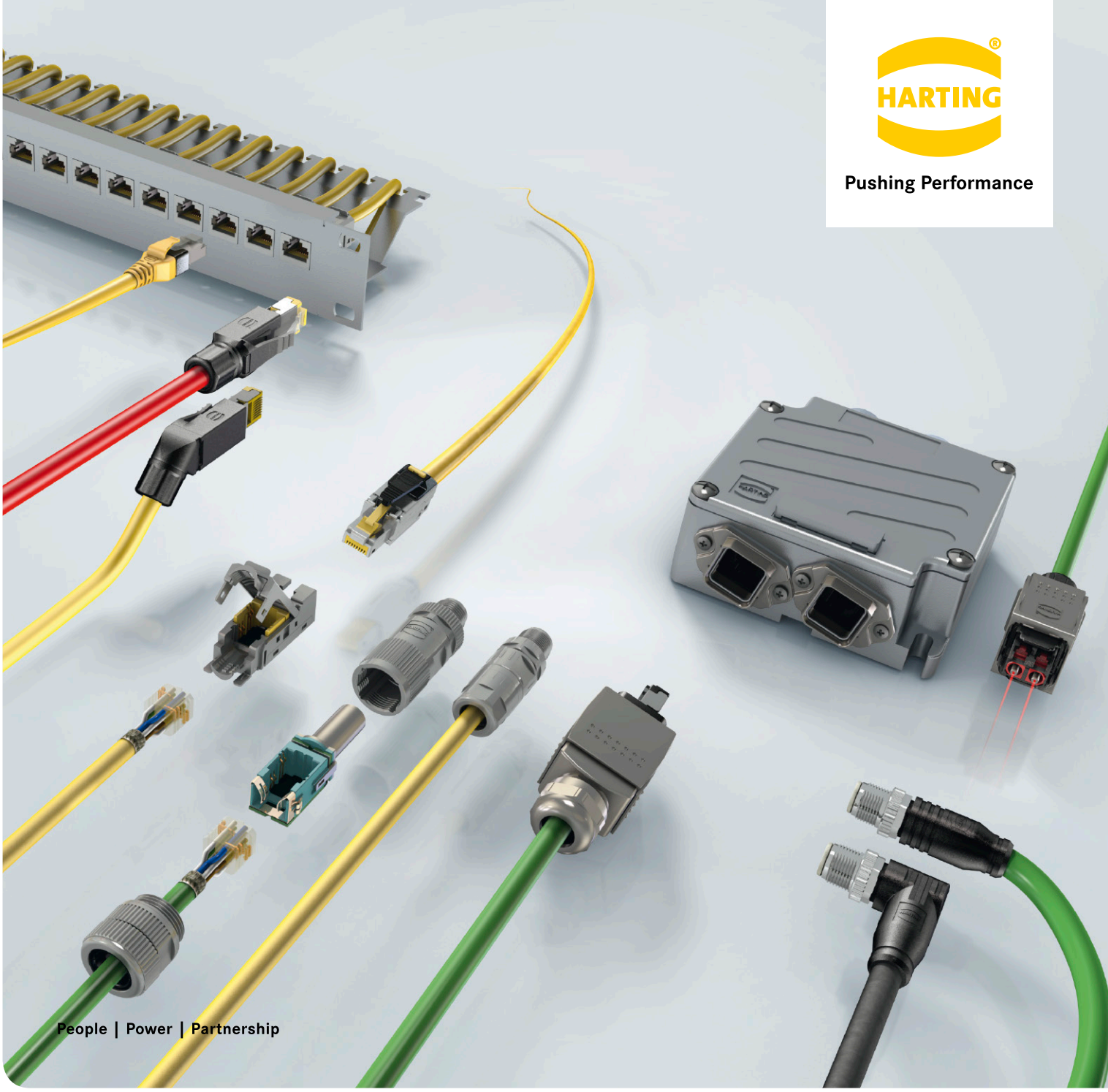


HARTING

Pushing Performance

HARTING Ethernet Cabling
Data Communication Networks for the Industry, Automation and Transportation

Transforming customer wishes into concrete solutions

The HARTING Technology Group is skilled in the fields of electrical, electronic and optical connection, transmission and networking technology, 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/data-networking applications, including, for example, mechanical engineering, rail technology, wind energy plants, factory automation and the telecommunications sector. In addition, HARTING also produces electro-magnetic components for the automobile industry and offers solutions in the field of housing technology and shop systems.

The HARTING Group currently comprises 53 sales companies and production plants worldwide employing a total of about 4.200 staff.

HARTING Subsidiary

HARTING Representation

We aspire to top performance.

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

Wherever our customers are, we're there.

Increasing industrialization is creating growing markets that are characterized by widely diverging demands and requirements. What these markets all share in common is the quest for perfection, increasingly efficient processes and reliable technologies. **HARTING** is providing these technologies – in Europe, the Americas and Asia. In order to implement customer requirements in the best possible manner, the **HARTING** professionals at our international subsidiaries engage in up-close, partnership-based interaction with our customers, right from the very early product development phase.

Our on-site staff 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 offer our customers the best possible solutions, on request **HARTING** contributes a great deal more and is tightly integrated into the value-creation process.

From ready-assembled cables through to control racks or ready-to-go control desks. Our aim is to generate maximum benefit for our customers – with no compromises!

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 are key elements here. We take a proactive stance towards new requirements, which is why **HARTING** is the first company worldwide to have obtained the 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 sophisticated network systems. Over the course of many years of close, trust-based cooperation with its customers, the **HARTING** Technology Group has become one of the leading specialists globally for connector technology. We offer individual customers specific and innovative solutions that go beyond the basic standard functionalities. These tailored solutions deliver sustained results, ensure investment security and enable customers to achieve significant added value.

Opting for HARTING opens up an innovative, complex world of concepts and ideas.

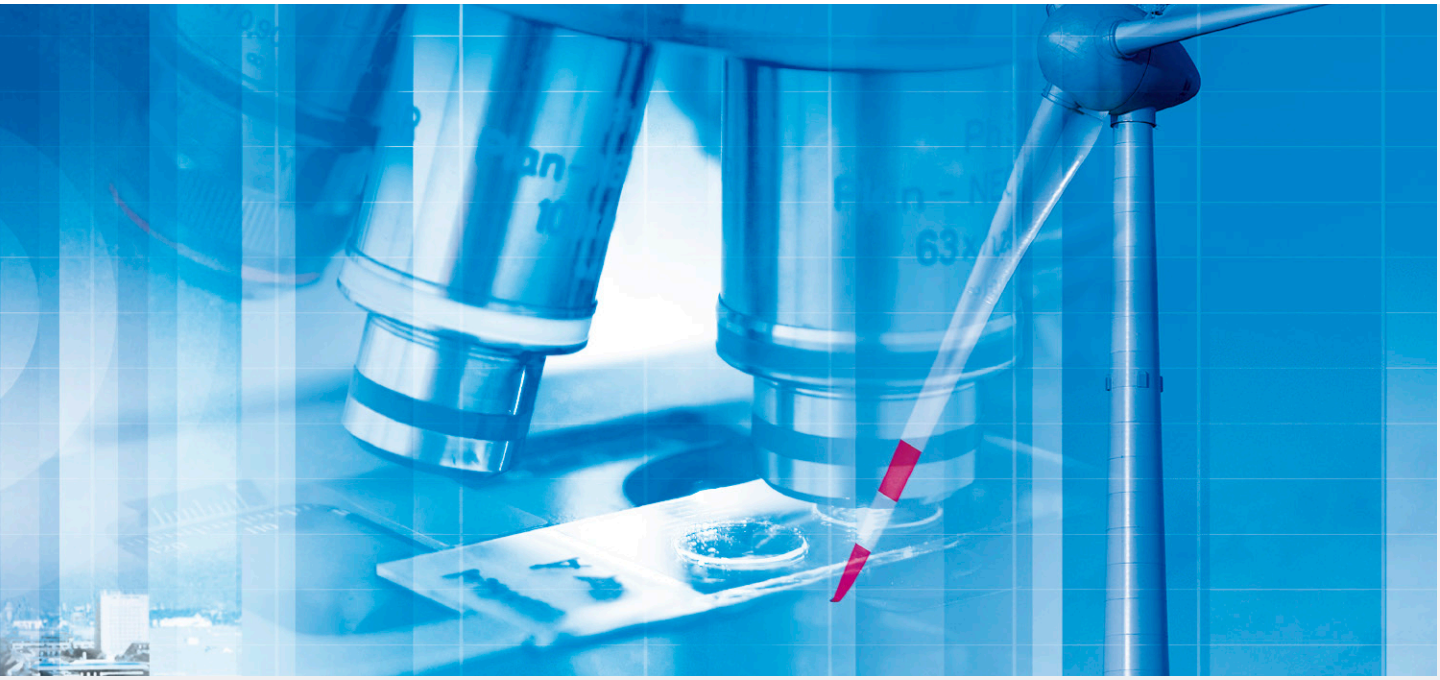
In order to develop and produce connectivity and network solutions serving an exceptionally wide range of connector applications in a professional and cost-effective manner, **HARTING** not only commands the full array of conventional tools and basic technologies. Above and beyond these capabilities, **HARTING** is constantly harnessing and refining its broad base of knowledge and experience to create new solutions that also ensure continuity. To secure its lead in know-how, HARTING draws on a wealth of sources from its in-house research and applications.

Salient examples of these sources of innovative knowledge include microstructure technologies, 3D design and connection technology, high-temperature and ultrahigh-frequency applications that are finding use in telecommunications and 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 and stainless steel.

HARTING overcomes technological limitations.

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 not only components, but comprehensive solutions attuned to individual customer requirements and preferences. The range of cost-effective solutions covers ready-to-use cable configurations, completely assembled backplanes and board system carriers, as well as fully wired and tested control panels.

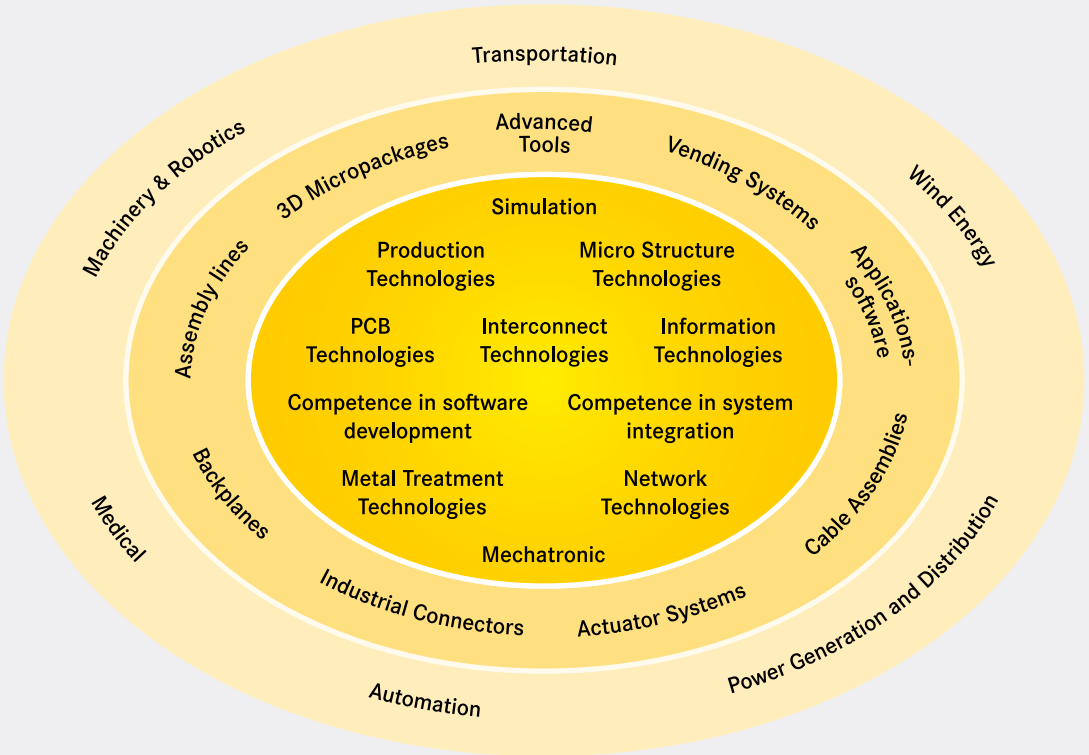
In order to ensure the future-proof design of RF and EMC-compatible interface solutions, the central HARTING laboratory (accredited according to DIN EN ISO/IEC 17025) employs simulation tools, as well as experimental, testing and diagnostics facilities all the way to Industrial computed tomography. In addition to product and process suitability considerations, lifecycle and environmental aspects play a key role in the selection of materials and processes.



HARTING's knowledge is practical know-how that generates synergy effects.

HARTING commands decades of experience with regard to the applications conditions involved in connections in telecommunications, computer, network and medical technologies, as well as industrial automation technologies, e.g. in the mechanical engineering and plant engineering areas, in addition to the power generation industry and the transportation sector.

HARTING is highly conversant with the specific application areas in all of these technology fields. In every solution approach, the key focus is on the application. In this context, uncompromising, superior quality is our hallmark. Every new solution found invariably flows 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. **HARTING** is synergy in action.



Smart Network Infrastructure

INTELLIGENT NETWORK SOLUTIONS

With its product series Ha-VIS, HARTING offers a consistent range of Ethernet network components and cabling products, which form the communication platform of convergent automation IT networks. Under Ha-VIS HARTING offers fully integrated RFID solutions.

Installation Technology

INDUSTRIAL CONNECTORS Han®

This catalogue documents the worldwide standard for industrial connectors. Han® connectors represent the preferential solution in the cable-to-cable interconnection of data, signal and power applications operating under the most demanding conditions and meeting stringent requirements with regard to safe and detachable electrical connections with high degree of protection IP65/IP67. Installations making use of Han® connectors impress with their rugged design, convenient handling and modularity of data, signal and power connections. Han® connectors represent the worldwide standard in industry, railway technology, as well as in power generation and distribution.

Device Connectivity

DEVICE CONNECTIVITY

The Device Connectivity catalogue provides a universal, innovative product portfolio of PCB connections and of termination technology.
The product range comprises board-to-board and cable-to-board connectors for industrial electronic devices with degree of protection IP20 to IP65/IP67.
These HARTING solutions offer appropriate device connectivity for a wide range of devices, ranging from sensors to industrial computers and their respective data, signal and power interfaces.

Directory

The **HARTING eCatalogue / eShop** can be found on our homepage at **www.HARTING.com** or at the direct link **www.eCatalogue.HARTING.com**.

The HARTING e-Catalogue is your platform for conveniently selecting individual products as well as configuring complete solutions. Our comprehensive product pages provide you with all necessary technical information and CAD files in various formats for downloading. You may also contact our technical sales department directly.

Find out about **product innovations and news** on the start page of the HARTING e-Catalogue or go directly to **www.product-news.HARTING.com**.

Registered users can take advantage of MyHARTING to check on availability or prices, and to place or track their orders. Here, your customized “HARTING history” provides you with a list of your inquiries, quotations and more.

Sign up now for your free e-Catalogue account at HARTING!

www.eShop.HARTING.com

Product samples: Fast-track delivery to your desk, free of charge

The new free express sample service in the HARTING eCatalogue allows customers to order samples immediately, easily and completely free of charge. A broad selection from the device connectivity product portfolio is now available. If a product is unavailable, the system offers alternative products with similar features that can be requested at a mouse click.

The free samples are shipped within 24 hours at no cost to you. This service enables tremendous flexibility, especially in the design phase of projects.

General information

It is the customer’s responsibility to check whether the components illustrated in this catalogue also comply with different regulations from those stated in special fields of applications.

We reserve the right to modify designs or substance of content 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 prior written consent of HARTING Electronics GmbH, Espelkamp. We are bound by the German version only.

This catalogue covers data network cabling for Ethernet in accordance with IEEE802.3.

These support all commonly used Ethernet transmission speeds:

Fast Ethernet with 100 Mbit/s, Gigabit Ethernet and 10 Gbit/s Ethernet for future applications.

PoE (Power over Ethernet) is supported (with up to 15.4 W in compliance with IEEE802.3af, and up to 25.5 W in compliance with IEEE802.3at) so that devices can be supplied with power through their Ethernet cables.

In order to make it easier for our customers to use HARTING cabling solutions and components in their applications, we have special solutions for:

- Automation technology, machine and systems engineering, robotics and other industrial applications
- F+B (food and beverage industry)
- Railway and transportation systems (e.g. bus, tram, metro)

Many of the products listed here can also be used for structured building cabling because the HARTING data networking components and systems are standard-compliant.

HARTING focuses on industrial and industry-related applications. We are working, together with our partner ZVK GmbH (www.zvk-gmbh.de), on the interfaces between facilities, machines and buildings. ZVK focuses on the building cabling itself.

HARTING‘s solutions are designed, tested and certified for the entire industry.

So IPx protection, mating reliability, robustness, vibration resistance and EMC safety are all critical factors.

For all automation applications, compatibility with the corresponding automation profiles according to IEC 61784-5-x and the associated cabling guidelines, is guaranteed.

The safety/fire tests according to EN 45 545 / DIN 5510, UL 1685 and other specific or national standards are also taken into account for our railway cabling solutions.

You can find more details in the product-specific pages, the product data sheets and the test reports (available on request separately).

To ensure optimal performance of all cabling components (cable, connector, coupling, etc.), our components are tested according to the internationally established limits for Category 5 / 5e (100 MHz), Category 6 (250 MHz), 6_A (500 MHz) and Category 7 (600 MHz).

These limits, along with the individual product standards, can be found in the current cabling standards: ISO/IEC 11 801 (valid internationally) and EN 50173 (valid throughout Europe).

The American standards for data network components and cabling (according to TIA/EIA 568x) mostly follow the ISO/IEC 11 801. They are, however, less strict in regards to certain limits (e.g. NEXT).

Thus, all cabling components tested in accordance with ISO/IEC 11801 also comply with the limits from TIA/EIA 568x.

After the entire cable path has been installed, the user can check his channel transmission performance according to the transmission classes (Class D up to 100 MHz, Class E to 250 MHz, Class EA to 500 MHz and Class F to 600 MHz).

The entire cabling, however, must be installed before this inspection can take place. The installation instructions supplied must also be carefully followed.

HARTING also provides bus cables with 120 Ω for MVB and WTB applications and the corresponding connectors to supplement our railway cabling product portfolio.

(MVB = Multifunction Vehicle Bus, WTB = Wire Train Bus; both bus systems are still widely in use but are increasingly being replaced by Ethernet).

All HARTING components have been designed, manufactured and tested in their particular installation environments to ensure their transmission speeds, performances, mating reliability and long-term stability.

Thus, our users can rely on a complete, powerful and proven portfolio of HARTING cabling components that precisely match their needs.

More technical information, references to the international body of standards, as well as useful information and explanations can be found on the pages and chapters to follow.

Notes

Directory Chapter 01

Notes

All pre-assembled copper cables supporting Fast Ethernet, Gigabit Ethernet or 10 Gigabit Ethernet are listed in the HARTING system cables/cords chapter.

Specifically, these are:

- Four-wire system cables for Fast Ethernet (Category 5 for 100 Mbit/s)
- Eight-wire system cables for Gigabit Ethernet (according to Category 5e or Category 6 for 1 Gbit/s, and Category 6_A or Category 7 for 10 Gbit/s)

RJ45 and M12 system cables have standardised transmission characteristics.

All system cables manufactured by HARTING have been designed, constructed and tested according to these standards.

Our users are ensured of outstanding safety levels when using HARTING system cables in their facilities.

The following exceptions should be noted:

- System cables (also sometimes referred to as patch cables, connecting cables or cabinet cables) are limited to 10 metres. If the system cables need to be longer than 10 metres, then the transmission characteristics must be calculated and checked according to the relevant category formulas.

  For simplicity‘s sake, transmission classes are often used as the basis for making this check. This is a legitimate method; however, in extreme cases this means that long system cords must be tested within the facility cabling.

- System cables are only defined as an RJ45 male plug – cable – RJ45 male plug combination. Since users often need other combinations in the real world, HARTING has expanded its system cabling portfolio.

  This includes combinations such male plug – cable – female socket or custom constructions such as male plug – cable – preLink® terminating block.

  To ensure quality and performance, HARTING has established relevant limit values and measurement methods which are often not yet adequately represented in the standards.

- Many industrial, railway or telecommunications applications require customised designs to achieve durable yet cost-effective solutions. Such customised solutions are provided by the GBU HCS.

(HCS = HARTING Customised Solutions)
http://www.HARTING-customised-solutions.com/en/home/

HARTING Ethernet cabling – RJ45 cords, 4-wire

HARTING RJ Industrial® system cable, 4-wire, straight

Features

- Connector types: RJ45
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- Locking lever protection
- PROFINET compliant
- Useable as trailing cable

Technical characteristics

Connector types	RJ45 overmoulded and locking lever protection
Cable type	S/FTP AWG 22/7, Cat. 5
Sheath material	PVC / PUR, PN type B and C
Wiring	4 pole, contacts 1/2 and 3/6
Transmission performance	Category 5
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +70 °C
Colour	Green (PROFINET), Red (SERCOS III)

HARTING Ethernet cabling – RJ45 cords, 4-wire

Identification		Part number Profinet	Part number SERCOS III*
HARTING RJ system cable, compact 4-wire Type B			
Length	0.5 m	09 48 686 8001 005	09 48 686 8006 005
	1.0 m	09 48 686 8001 010	09 48 686 8006 010
	1.5 m	09 48 686 8001 015	09 48 686 8006 015
	3.0 m	09 48 686 8001 030	09 48 686 8006 030
	5.0 m	09 48 686 8001 050	09 48 686 8006 050
	7.5 m	09 48 686 8001 075	09 48 686 8006 075
	10.0 m	09 48 686 8001 100	09 48 686 8006 100
	15.0 m	09 48 686 8001 150	09 48 686 8006 150
	20.0 m	09 48 686 8001 200	09 48 686 8006 200
HARTING RJ system cable, compact 4-wire Type C			
Length	0.5 m	09 48 686 8004 005	09 48 686 8007 005
	1.0 m	09 48 686 8004 010	09 48 686 8007 010
	1.5 m	09 48 686 8004 015	09 48 686 8007 015
	3.0 m	09 48 686 8004 030	09 48 686 8007 030
	5.0 m	09 48 686 8004 050	09 48 686 8007 050
	7.5 m	09 48 686 8004 075	09 48 686 8007 075
	10.0 m	09 48 686 8004 100	09 48 686 8007 100
	15.0 m	09 48 686 8004 150	09 48 686 8007 150
	20.0 m	09 48 686 8004 200	09 48 686 8007 200

* under preparation
Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 4-wire

HARTING RJ Industrial®
system cable, 4-wire, angled

Features

- Connector types: RJ45
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- Locking lever protection
- PROFINET compliant
- Useable as trailing cable

Technical characteristics

Connector types	RJ45 overmoulded and locking lever protection
Cable type	S/FTP AWG 22/7, Cat. 5
Sheath material	PVC / PUR, PN type B and C
Wiring	4 pole, contacts 1/2 and 3/6
Transmission performance	Category 5
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +70 °C
Colour	Green (PROFINET)

HARTING Ethernet cabling – RJ45 cords, 4-wire

Identification		Part number
HARTING RJ Industrial® system cable, angled, 4-wire Type A, angled left to angled right	Length 0.5 m	09 47 050 6001
	1.0 m	09 47 050 6002
	1.5 m	09 47 050 6003
	2.0 m	09 47 050 6004
	3.0 m	09 47 050 6005
	5.0 m	09 47 050 6007
HARTING RJ Industrial® system cable, angled, 4-wire Type B, angled left to angled right	Length 0.5 m	09 47 050 6023
	1.0 m	09 47 050 6024
	1.5 m	09 47 050 6025
	2.0 m	09 47 050 6026
	3.0 m	09 47 050 6027
	5.0 m	09 47 050 6029
HARTING RJ Industrial® system cable, angled, 4-wire Type C, angled left to angled right	Length 0.5 m	09 47 050 6045
	1.0 m	09 47 050 6046
	1.5 m	09 47 050 6047
	2.0 m	09 47 050 6048
	3.0 m	09 47 050 6049
	5.0 m	09 47 050 6051
HARTING RJ Industrial® system cable, angled, 4-wire Outdoor, angled left to angled right	Length 0.5 m	09 47 050 6067
	1.0 m	09 47 050 6068
	1.5 m	09 47 050 6069
	2.0 m	09 47 050 6070
	3.0 m	09 47 050 6071
	5.0 m	09 47 050 6073

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 4-wire

HARTING RJ Industrial®
system cable, 4-wire, angled

Features

- Connector types: RJ45
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- Locking lever protection
- PROFINET compliant
- Useable as trailing cable

Technical characteristics

Connector types	RJ45 overmoulded and locking lever protection
Cable type	S/FTP AWG 22/7, Cat. 5
Sheath material	PVC / PUR, PN type B and C
Wiring	4 pole, contacts 1/2 and 3/6
Transmission performance	Category 5
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +70 °C
Colour	Green (PROFINET)

HARTING Ethernet cabling – RJ45 cords, 4-wire

Identification		Part number
HARTING RJ Industrial® system cable, angled, 4-wire Type A, angeld top to angled bottom	Length 0.5 m	09 47 030 4001
	1.0 m	09 47 030 4002
	1.5 m	09 47 030 4003
	2.0 m	09 47 030 4004
	3.0 m	09 47 030 4005
	5.0 m	09 47 030 4007
HARTING RJ Industrial® system cable, angled, 4-wire Type B, angeld top to angled bottom	Length 0.5 m	09 47 030 4023
	1.0 m	09 47 030 4024
	1.5 m	09 47 030 4025
	2.0 m	09 47 030 4026
	3.0 m	09 47 030 4027
	5.0 m	09 47 030 4029
HARTING RJ Industrial® system cable, angled, 4-wire Type C, angeld top to angled bottom	Length 0.5 m	09 47 030 4045
	1.0 m	09 47 030 4046
	1.5 m	09 47 030 4047
	2.0 m	09 47 030 4048
	3.0 m	09 47 030 4049
	5.0 m	09 47 030 4051
HARTING RJ Industrial® system cable, angled, 4-wire Outdoor, angeld top to angled bottom	Length 0.5 m	09 47 030 4067
	1.0 m	09 47 030 4068
	1.5 m	09 47 030 4069
	2.0 m	09 47 030 4070
	3.0 m	09 47 030 4071
	5.0 m	09 47 030 4073

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 4-wire

Exit left

Exit right

Exit top

Exit bottom

HARTING RJ Industrial®
system cable 4-wire, angled

Features

- Connector types: RJ45
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- Locking lever protection
- PROFINET compliant
- Useable as trailing cable

Technical characteristics

Connector types	RJ45 overmoulded and locking lever protection
Cable type	S/FTP AWG 22/7, Cat. 5
Sheath material	PVC / PUR, PN type B and C
Wiring	4 pole, contacts 1/2 and 3/6
Transmission performance	Category 5
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +70 °C
Colour	Green (PROFINET)

Exit left

Exit right

Exit top

Exit bottom

HARTING RJ Industrial® system cable 4-wire, angled

Identification		Part number angled left	angled right	angled top	angled bottom
HARTING RJ Industrial® system cable RJ45 angled, 4-wire one side pre-assembled, second side open Cable type B, green 2 x 2 x AWG 22/7	Length 0.5 m	09 47 050 0023	09 47 060 0023	09 47 030 0023	09 47 040 0023
	1.0 m	09 47 050 0024	09 47 060 0024	09 47 030 0024	09 47 040 0024
	1.5 m	09 47 050 0025	09 47 060 0025	09 47 030 0025	09 47 040 0025
	2.0 m	09 47 050 0026	09 47 060 0026	09 47 030 0026	09 47 040 0026
	3.0 m	09 47 050 0027	09 47 060 0027	09 47 030 0027	09 47 040 0027
	5.0 m	09 47 050 0029	09 47 060 0029	09 47 030 0029	09 47 040 0029
HARTING RJ Industrial® system cable RJ45 angled, 4-wire one side pre-assembled, second side open Cable type C, green 2 x 2 x AWG 22/7	Length 0.5 m	09 47 050 0045	09 47 060 0045	09 47 030 0045	09 47 040 0045
	1.0 m	09 47 050 0046	09 47 060 0046	09 47 030 0046	09 47 040 0046
	1.5 m	09 47 050 0047	09 47 060 0047	09 47 030 0047	09 47 040 0047
	2.0 m	09 47 050 0048	09 47 060 0048	09 47 030 0048	09 47 040 0048
	3.0 m	09 47 050 0049	09 47 060 0049	09 47 030 0049	09 47 040 0049
	5.0 m	09 47 050 0051	09 47 060 0051	09 47 030 0051	09 47 040 0051
HARTING RJ Industrial® system cable RJ45 angled, 4-wire one side pre-assembled, second side open Outdoor cable, black 2 x 2 x AWG 22/7	Length 0.5 m	09 47 050 0067	09 47 060 0067	09 47 030 0067	09 47 040 0067
	1.0 m	09 47 050 0068	09 47 060 0068	09 47 030 0068	09 47 040 0068
	1.5 m	09 47 050 0069	09 47 060 0069	09 47 030 0069	09 47 040 0069
	2.0 m	09 47 050 0070	09 47 060 0070	09 47 030 0070	09 47 040 0070
	3.0 m	09 47 050 0071	09 47 060 0071	09 47 030 0071	09 47 040 0071
	5.0 m	09 47 050 0073	09 47 060 0073	09 47 030 0073	09 47 040 0073

HARTING Ethernet cabling – RJ45 cords, 4-wire

preLink®
system cable, 4-wire, straight

Features

- Connector types: RJ45 – preLink®
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- PROFINET compliant
- The preLink® termination block can be terminated to all preLink® components like the RJ45 or the M12 X- and D-coded plugs and jacks

Technical characteristics

Connector types	RJ45 overmoulded and locking lever protection
Cable type	S/FTP AWG 22/7, Cat. 5
Sheath material	PUR, PN type B and C
Wiring	4 pole, contacts 1/2 and 3/6
Transmission performance	Category 5
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +70 °C
Colour	Green (PROFINET)

Identification		Part number
preLink® system cable, 4-wire, straight		
Length	0.2 m	20 82 631 1002
	0.4 m	20 82 631 1004
	0.6 m	20 82 631 1006
	0.8 m	20 82 631 1008
	1.0 m	20 82 631 1010
	2.0 m	20 82 631 1020
	3.0 m	20 82 631 1030
	4.0 m	20 82 631 1040
	5.0 m	20 82 631 1050
	10.0 m	20 82 631 1100

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 4-wire

preLink®
system cable, 4-wire, straight

Features

- Connector types: preLink®
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Very robust RJ45 cord
- Very large temperature range
- PROFINET compliant
- The preLink® termination block can be terminated to all preLink® components like the RJ45 or the M12 X- and D-coded plugs and jacks

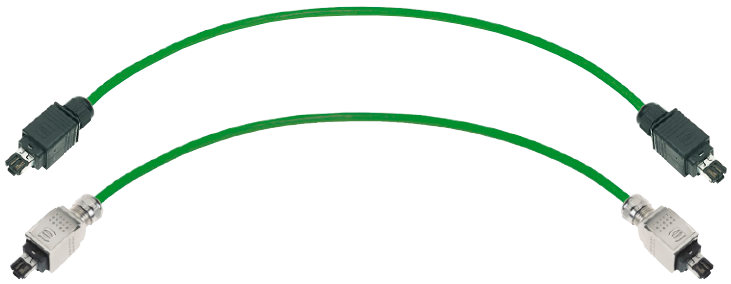
Technical characteristics

Connector types	RJ45 overmoulded and locking lever protection
Cable type	S/FTP AWG 22/7, Cat. 5
Sheath material	PUR, PN type B and C
Wiring	4 pole, contacts 1/2 and 3/6
Transmission performance	Category 5
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +70 °C
Colour	Green (PROFINET)

Identification		Part number
preLink® system cable, 4-wire, straight		
Length	0.2 m	20 82 630 2002
	0.4 m	20 82 630 2004
	0.6 m	20 82 630 2006
	0.8 m	20 82 630 2008
	1.0 m	20 82 630 2010
	2.0 m	20 82 630 2020
	3.0 m	20 82 630 2030
	4.0 m	20 82 630 2040
	5.0 m	20 82 630 2050
	10.0 m	20 82 630 2100

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 4-wire



Han® PushPull RJ45
system cable, 4-wire

Features

- Connector types: Han® PushPull RJ45 (V14)
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Standardised PushPull interface for IP65 / IP67
- Very space-saving
- AIDA compliant
- PROFINET compliant
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

Connector types: Han® PushPull RJ45

Cable type

Cable type	Type B	Type C
Cables	Copper, stranded, shielded	Copper, stranded, shielded, useable as trailing cable
Wire gauge	4 x AWG 22/7	4 x AWG 22/7
Sheath material	PVC	PUR
Operating temperature range	–40 °C … +70 °C	–40 °C … +70 °C
Application PROFINET	Green	Green

Cable type	Outdoor
Cables	Copper, stranded, shielded
Wire gauge	4 x AWG 22/7
Sheath material	PVC
Operating temperature range	–45 °C … +60 °C
Application PROFINET	Black

Wiring: 4 pole, contacts 1/2 and 3/6

Transmission performance: Category 5

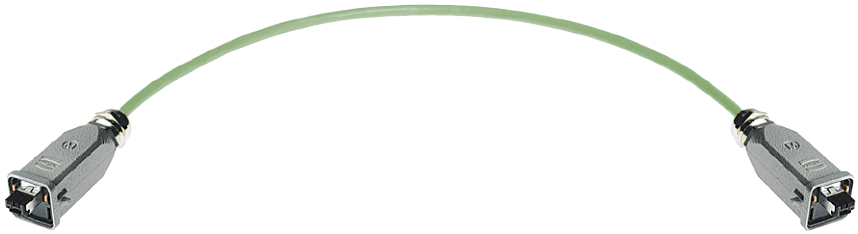
Transmission rate: 10/100 Mbit/s

Shielding: Fully shielded, 360° shielding contact

HARTING Ethernet cabling – RJ45 cords, 4-wire

Identification		Part number Plastic version	Metal version	Metal, overmoulded
Han® PushPull RJ45 system cable, 4-wire Type B				
	Length 1.5 m	09 47 555 5033	09 47 565 6033	09 47 565 7033
	3.0 m	09 47 555 5035	09 47 565 6035	09 47 565 7035
	5.0 m	09 47 555 5037	09 47 565 6037	09 47 565 7037
	10.0 m	09 47 555 5042	09 47 565 6042	09 47 565 7042
	20.0 m	09 47 555 5044	09 47 565 6044	09 47 565 7044
Han® PushPull RJ45 system cable, 4-wire Type C				
	Length 1.5 m	09 47 555 5063	09 47 565 6063	09 47 565 7063
	3.0 m	09 47 555 5065	09 47 565 6065	09 47 565 7065
	5.0 m	09 47 555 5067	09 47 565 6067	09 47 565 7067
	10.0 m	09 47 555 5072	09 47 565 6072	09 47 565 7072
	20.0 m	09 47 555 5074	09 47 565 6074	09 47 565 7074
Han® PushPull RJ45 system cable, 4-wire Outdoor				
	Length 1.5 m	09 47 555 5093	09 47 565 6093	09 47 565 7093
	3.0 m	09 47 555 5095	09 47 565 6095	09 47 565 7095
	5.0 m	09 47 555 5097	09 47 565 6097	09 47 565 7097
	10.0 m	09 47 555 5102	09 47 565 6102	09 47 565 7102
	20.0 m	09 47 555 5104	09 47 565 6104	09 47 565 7104

Other cable lengths on request



Han® 3 A RJ45
system cable, 4-wire, straight

Features

- Connector types: Han® 3 A RJ45 metal (V5)
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Robust design
- Use on-site made possible by IP65 / IP67 protection
- Easy handling for all applications
- PROFINET compliant

Technical characteristics

Connector types: Han® 3 A RJ45 metal

Cable type

Cable type	Type B	Type C
Cables	Copper, stranded, shielded	Copper, stranded, shielded, useable as trailing cable
Wire gauge	4 x AWG 22/7	4 x AWG 22/7
Sheath material	PVC	PUR
Operating temperature range	–40 °C … +70 °C	–40 °C … +70 °C
Application PROFINET	Green	Green

Cable type	Outdoor
Cables	Copper, stranded, shielded
Wire gauge	4 x AWG 22/7
Sheath material	PVC
Operating temperature range	–45 °C … +60 °C
Application PROFINET	Black

Wiring: 4 pole, contacts 1/2 and 3/6

Transmission performance: Category 5

Transmission rate: 10/100 Mbit/s

Shielding: Fully shielded, 360° shielding contact

HARTING Ethernet cabling – RJ45 cords, 4-wire

Identification		Part number
Han® 3 A RJ45 system cable, 4-wire Type B		
	Length 1.5 m	09 45 715 1164
	3.0 m	09 45 715 1166
	5.0 m	09 45 715 1168
	10.0 m	09 45 715 1173
	20.0 m	09 45 715 1175
Han® 3 A RJ45 system cable, 4-wire Type C		
	Length 1.5 m	09 45 715 0023
	3.0 m	09 45 715 0025
	5.0 m	09 45 715 0027
	10.0 m	09 45 715 0051
	20.0 m	09 45 715 0053
Han® 3 A RJ45 system cable, 4-wire Outdoor		
	Length 1.5 m	09 45 715 0064
	3.0 m	09 45 715 0066
	5.0 m	09 45 715 0068
	10.0 m	09 45 715 0073
	20.0 m	09 45 715 0075

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 4-wire

Han® 3 A RJ45
system cable, 4-wire, straight

Features

- Connector types: Han® 3 A RJ45 metal (V5) (IP65/IP67) / RJ45 (IP20)
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Robust design
- Easy change-over from harsh industrial environment to protected IP20 environment
- Easy handling for all applications
- PROFINET compliant

Technical characteristics

Connector types: Han® 3 A RJ45 metal (IP65/IP67) / RJ45 (IP20)

Cable type

Cable type	Type B	Type C
Cables	Copper, stranded, shielded	Copper, stranded, shielded, useable as trailing cable
Wire gauge	4 x AWG 22/7	4 x AWG 22/7
Sheath material	PVC	PUR
Operating temperature range	–40 °C … +70 °C	–40 °C … +70 °C
Application PROFINET	Green	Green

Wiring: 4 pole, contacts 1/2 and 3/6

Transmission performance: Category 5

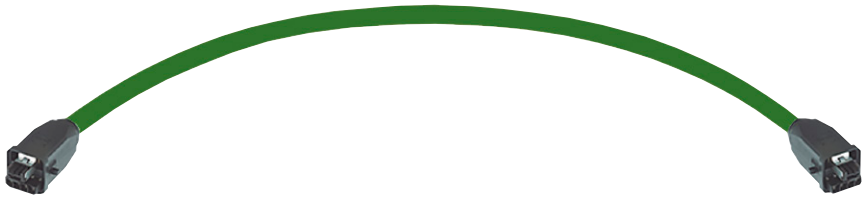
Transmission rate: 10/100 Mbit/s

Shielding: Fully shielded, 360° shielding contact

Identification		Part number
Han® 3 A RJ45 system cable, 4-wire Type B		
	Length 1.5 m	09 45 700 1164
	3.0 m	09 45 700 1166
	5.0 m	09 45 700 1168
	10.0 m	09 45 700 1173
	20.0 m	09 45 700 1175
Han® 3 A RJ45 system cable, 4-wire Type C		
	Length 1.5 m	09 45 700 0023
	3.0 m	09 45 700 0025
	5.0 m	09 45 700 0027
	10.0 m	09 45 700 0051
	20.0 m	09 45 700 0053

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 4-wire



Han® 3 A RJ45 Hybrid
system cable, 4-wire, straight

Features

• Connector types	Han® 3 A RJ45 Hybrid (V5) plastic / metal
• Category	Cat. 5
• Number of wires	4 (data) + 4 (power)
• Wiring	1:1
• Sheath material	FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Robust design
- Use on-site made possible via IP65 / IP67 protection
- Easy handling for applications with additional power supply
- PROFINET compliant

Technical characteristics

Connector types	Han® 3 A RJ45 Hybrid, plastic / metal
Cable type	4 x AWG 22/7, star quad, shielded + 4 x 1.5 mm² power cores
Sheath material	FRNC, halogen free
Wiring	4 pole, contacts 1/2 and 3/6
Transmission performance	Category 5
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-20 °C … +70 °C
Colour	Green
Data power supply: Rated voltage Rated current	 48 V / DC 16 A

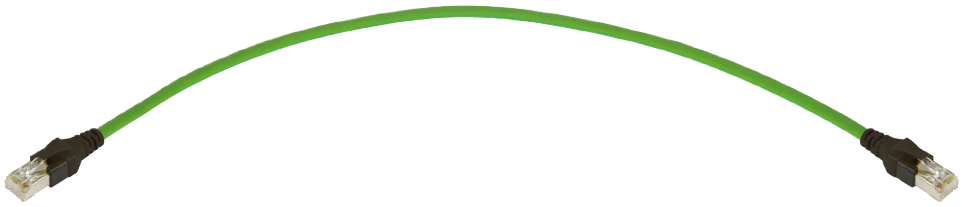
HARTING Ethernet cabling – RJ45 cords, 4-wire

Identification		Part number
Han® 3 A RJ45 Hybrid system cable, 4-wire, plastic		
	Length 1.5 m	09 45 725 1323
	3.0 m	09 45 725 1325
	5.0 m	09 45 725 1327
	10.0 m	09 45 725 1351
	20.0 m	09 45 725 1353
Han® 3 A RJ45 Hybrid system cable, 4-wire, metal		
	Length 1.5 m	09 45 715 1364
	3.0 m	09 45 715 1366
	5.0 m	09 45 715 1368
	10.0 m	09 45 715 1373
	20.0 m	09 45 715 1375

Other cable lengths on request

Notes

HARTING Ethernet cabling – RJ45 cords, 8-wire



PROFINET cabinet cord Cat. 6

Features

- Connector types: RJ45
- Category: Cat. 6
- Number of wires: 8
- Wiring: 1:1
- Sheath material: PVC

Application

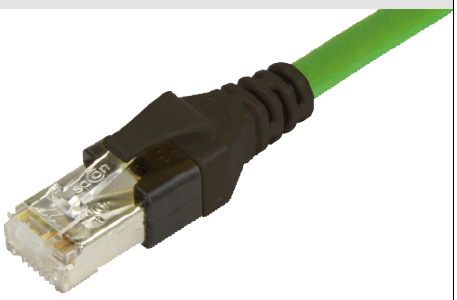
- Industrial Cabling
- Within switch cabinets
- Within distribution cabinets on machines and control units

Benefits

- Transmission of up to 1 Gbit/s
- Very robust RJ45 cord
- Locking lever protection
- PROFINET compliant
- Reliable data transmission due to high EMC-immunity

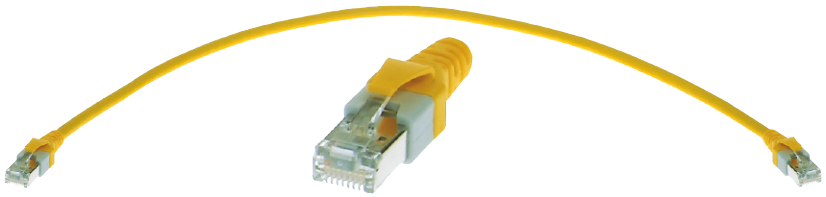
Technical characteristics

Connector types	RJ45 overmoulded and locking lever protection
Cable type	S/FTP AWG 26/7, Cat. 6_A
Sheath material	PVC
Wiring	8 pole, 1:1, TIA/EIA-568-B
Transmission performance	Category 6, Class E up to 250 MHz according ISO/IEC 11801 and EN 50173-1
Transmission rate	10/100 Mbit/s and 1 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Coupling attenuation	≥ 80 dB (segregation class d)
Characteristic impedance	100 ± 5 Ω
Leteral force	1000 N
Bending radius	Repeated bending ≥ 55 mm Single bending ≥ 30 mm
Operating temperature range	-20 °C … +70 °C
Flame retardant	acc. IEC 60332-1-2

Identification		Part number	Drawing
PROFINET cabinet cord 8-wire			
Length	0.3 m	09 48 474 7766 003	
	0.5 m	09 48 474 7766 005	
	1.0 m	09 48 474 7766 010	
	1.5 m	09 48 474 7766 015	
	2.0 m	09 48 474 7766 020	
	3.0 m	09 48 474 7766 030	
	5.0 m	09 48 474 7766 050	

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 8-wire



HARTING RJ Industrial®
patch cable, overmoulded, 8-wire, Cat. 5e

Features

• Connector types	RJ45
• Category	Cat. 5e
• Number of wires	8
• Wiring	1:1
• Sheath material	PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

Benefits

- Robust industrial design
- Flexible, space saving
- Locking lever protection
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

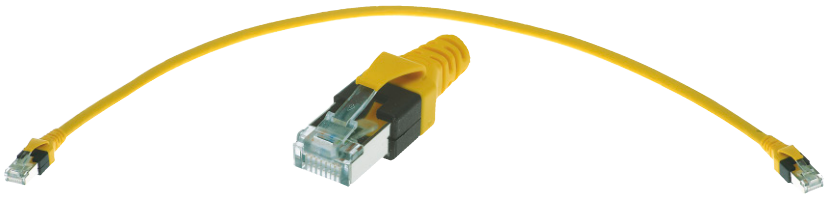
Technical characteristics

Connector types	RJ45, overmoulded, with locking lever protection
Cable types	4 x 2, Twisted Pair, shielded, SF/UTP
Sheath material	PUR, halogen free LSZH
Wiring	8 pole, 1:1
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	0 °C … +60 °C
Colour	Yellow

Identification		Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® patch cable, 8-wire, Cat. 5e, overmoulded		Yellow		
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		
HARTING RJ Industrial® colour clips for HARTING RJ Industrial® connectors package with 10 pieces				
Colour:	Grey	09 45 870 0002		
	Yellow	09 45 870 0003		
	Orange	09 45 870 0006		
	Red	09 45 870 0007		
	Blue	09 45 870 0008		
	Green	09 45 870 0009		
	Black	09 45 870 0011		

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 8-wire



HARTING RJ Industrial®
patch cable, overmoulded, 8-wire, Cat. 6

Features

- Connector types: RJ45
- Category: Cat. 6
- Number of wires: 8
- Wiring: 1:1 and crossed
- Sheath material: PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

Benefits

- Robust industrial design
- Flexible, space saving
- Locking lever protection
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

Connector types	RJ45, overmoulded, with locking lever protection
Cable types	4 x 2, Twisted Pair, shielded, S/FTP Category 7 acc. to IEC 61156-6, EN 50288-4-2
Sheath material	PUR, halogen free LSZH
Wiring	8 pole, 1:1 or crossed
Transmission performance	Category 6 / Class E up to 250 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	0 °C … +60 °C
Colour	Yellow

HARTING Ethernet cabling – RJ45 cords, 8-wire

Identification		Part number		Drawing	Dimensions in mm
HARTING RJ Industrial® patch cable, 8-wire, Cat. 6, overmoulded		Yellow 1:1	Yellow crossed		
Length	0.2 m	09 47 474 7101	09 47 474 7141		
	0.3 m	09 47 474 7102	09 47 474 7142		
	0.4 m	09 47 474 7103	09 47 474 7143		
	0.5 m	09 47 474 7104	09 47 474 7144		
	0.6 m	09 47 474 7105	09 47 474 7145		
	0.7 m	09 47 474 7106	09 47 474 7146		
	0.8 m	09 47 474 7107	09 47 474 7147		
	0.9 m	09 47 474 7108	09 47 474 7148		
	1.0 m	09 47 474 7109	09 47 474 7149		
	1.5 m	09 47 474 7110	09 47 474 7150		
	2.0 m	09 47 474 7111	09 47 474 7151		
	2.5 m	09 47 474 7112	09 47 474 7152		
	3.0 m	09 47 474 7113	09 47 474 7153		
	4.0 m	09 47 474 7114	09 47 474 7154		
	5.0 m	09 47 474 7115	09 47 474 7155		
	6.0 m	09 47 474 7116	09 47 474 7156		
	7.0 m	09 47 474 7117	09 47 474 7157		
	7.5 m	09 47 474 7118	09 47 474 7158		
	8.0 m	09 47 474 7119	09 47 474 7159		
	9.0 m	09 47 474 7120	09 47 474 7160		
	10.0 m	09 47 474 7121	09 47 474 7161		
	15.0 m	09 47 474 7122	09 47 474 7162		
	20.0 m	09 47 474 7123	09 47 474 7163		
HARTING RJ Industrial® colour clips for HARTING RJ Industrial® connectors package with 10 pieces					
Colour:	Grey	09 45 870 0002			
	Yellow	09 45 870 0003			
	Orange	09 45 870 0006			
	Red	09 45 870 0007			
	Blue	09 45 870 0008			
	Green	09 45 870 0009			
	Black	09 45 870 0011			

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 8-wire

Patch cable RJ45 DualBoot®,
Cat. 5 / Cat. 5e, shielded

Features

- Connector types: RJ45
- Category: Cat. 5e
- Number of wires: 8
- Wiring: 1:1
- Sheath material: FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- In IT networks

Benefits

- Flexible, space saving
- Different colours, characterization of services
- Halogen free and RoHS compliant
- Compliant acc. ISO / IEC 11 801

Technical characteristics

Connector types	RJ45 with DualBoot®
Cable type	4x2 Twisted Pair, screened SF-UTP
Sheath material	FRNC, halogen free
Wiring	8 pole, 1:1
Transmission performance	Category 5e, Class D up to 100 MHz according ISO / IEC 11 801 and EN 50 173-1
Transmission rate	10/100 Mbit/s and 1 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	0 °C … +60 °C
Lengths	All lengths available in 10 cm steps
Lengths key	xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
Colour	White, grey, red, yellow, green, blue
Minimum order quantity	Up to 3 m: 10 pcs. between 3 m and 5 m: 5 pcs.

Identification	Part number
Patch cable Cat. 5 / Cat. 5e DualBoot® 1:1	
white	09 48 868 6568 xxx
grey	09 48 868 6569 xxx
red	09 48 868 6570 xxx
yellow	09 48 868 6571 xxx
green	09 48 868 6572 xxx
blue	09 48 868 6573 xxx

Patch cable RJ45 DualBoot®,
Cat. 6_A, shielded

Features

- Connector types: RJ45
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- In IT networks

Benefits

- Transmission of up to 10 Gbit/s
- Flexible, space saving
- Different colours, characterization of services
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

Connector types	RJ45 with DualBoot®
Cable type	4x2 Twisted Pair, screened SF-STP
Sheath material	FRNC, halogen free
Wiring	8 pole, 1:1
Transmission performance	Category 6_A, Class E_A up to 250 MHz according ISO/IEC 11801 and EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	0 °C … +60 °C
Lengths	All lengths available in 10 cm steps
Lengths key	xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
Colour	White, grey, red, yellow, green, blue

Identification	Part number
Patch cable Cat. 6_A DualBoot® 1:1	
white	09 48 878 7584 xxx
grey	09 48 878 7585 xxx
red	09 48 878 7586 xxx
yellow	09 48 878 7587 xxx
green	09 48 878 7588 xxx
blue	09 48 878 7589 xxx

HARTING Ethernet cabling – RJ45 cords, 8-wire

PushPull patch cable RJ45 DualBoot®, Cat. 5 / Cat. 5e, shielded

Features

- Connector types: RJ45 with PushPull locker
- Category: Cat. 5e
- Number of wires: 8
- Wiring: 1:1
- Sheath material: FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- In IT networks

Benefits

- PushPull locking mechanism
- Different colours, characterization of services
- Halogen free and RoHS compliant
- Compliant acc. ISO / IEC 11 801

Technical characteristics

Connector types	RJ45 with DualBoot® and PushPull locker
Cable type	4x2 Twisted Pair, screened SF-STP
Sheath material	FRNC, halogen free
Wiring	8 pole, 1:1
Transmission performance	Category 5, Class D up to 100 MHz according ISO / IEC 11 801 and EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	0 °C … +60 °C
Lengths	All lengths available in 10 cm steps
Lengths key	xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
Colour	Grey, red, yellow, green, blue, orange
Minimum order quantity	Up to 3 m: 10 pcs. between 3 m and 5 m: 5 pcs.

Identification	Part number
PushPull patch cable Cat. 5 / Cat. 5e DualBoot® 1:1	
grey	09 48 898 9595 xxx
red	09 48 898 9596 xxx
yellow	09 48 898 9597 xxx
green	09 48 898 9594 xxx
blue	09 48 898 9598 xxx
orange	09 48 898 9593 xxx

PushPull patch cable RJ45 DualBoot®
Cat. 6_A, shielded

Features

- Connector types: RJ45 with PushPull locker
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- In IT networks

Benefits

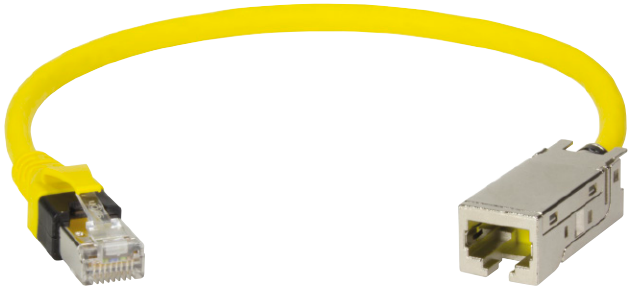
- Transmission of up to 10 Gbit/s
- PushPull locking mechanism
- Different colours, characterization of services
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

Connector types	RJ45 with DualBoot® and PushPull locker
Cable type	4x2 Twisted Pair, screened SF-STP
Sheath material	FRNC, halogen free
Wiring	8 pole, 1:1
Transmission performance	Category 6_A, Class E_A up to 250 MHz according ISO/IEC 11801 and EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	0 °C … +60 °C
Lengths	All lengths available in 10 cm steps
Lengths key	xxx = length in dm (standard length: 5, 10, 15, 20, 25, 30, 50, 75 und 100 dm), e.g. 005 for 5 dm length
Colour	Grey, red, yellow, green, blue, orange
Minimum order quantity	Up to 3 m: 10 pcs. between 3 m and 5 m: 5 pcs.

Identification	Part number
PushPull patch cable Cat. 6_A DualBoot® 1:1	
grey	09 48 888 8576 xxx
red	09 48 888 8577 xxx
yellow	09 48 888 8578 xxx
green	09 48 888 8579 xxx
blue	09 48 888 8580 xxx
orange	09 48 888 8592 xxx

HARTING Ethernet cabling – RJ45 cords, 8-wire



HARTING RJ Industrial®
patch cable, overmoulded, 8-wire, Cat. 6

Features

- Connector types: RJ45
- Category: Cat. 6
- Number of wires: 8
- Wiring: 1:1
- Sheath material: FRNC, halogen free

Application

- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

Benefits

- Robust industrial design
- Flexible, space saving
- Locking lever protection
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

Technical characteristics

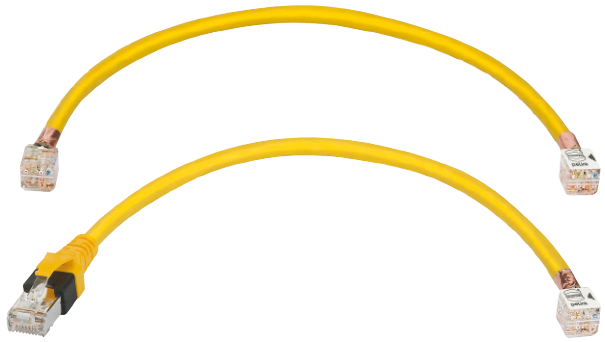
Connector types	RJ45, overmoulded, with locking lever protection
Cable types	4 x 2, Twisted Pair, shielded, S/FTP Category 7 acc. to IEC 61156-6, EN 50288-4-2
Sheath material	FRNC, halogen free
Wiring	8 pole, 1:1 or crossed
Transmission performance	Category 6 / Class E up to 250 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	0 °C … +60 °C
Colour	Yellow

Identification		Part number
HARTING RJ Industrial® patch cable, 8-wire		
Length	0.15 m	09 45 545 1500
	0.2 m	09 45 545 1501
	0.3 m	09 45 545 1502
	0.4 m	09 45 545 1503
	0.5 m	09 45 545 1504
	0.6 m	09 45 545 1505
	0.7 m	09 45 545 1506
	0.8 m	09 45 545 1507
	0.9 m	09 45 545 1508
	1.0 m	09 45 545 1509
	1.5 m	09 45 545 1510
	2.0 m	09 45 545 1511
	2.5 m	09 45 545 1512
	3.0 m	09 45 545 1513
	3.5 m	09 45 545 1514
	4.0 m	09 45 545 1515
	5.0 m	09 45 545 1516
	7.5 m	09 45 545 1517
	10.0 m	09 45 545 1518

Other cable lengths on request

Notes

HARTING Ethernet cabling – RJ45 cords, 8-wire



preLink® patch cable

Features

- Connector types: RJ45 – preLink®
- Category: Cat. 6
- Number of wires: 8
- Wiring: 1:1 and crossed
- Sheath material: PUR

Application

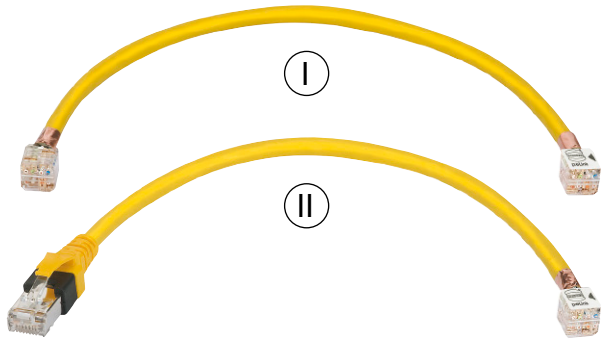
- Industrial Cabling
- Within switch cabinets
- On machines
- In IT networks

Benefits

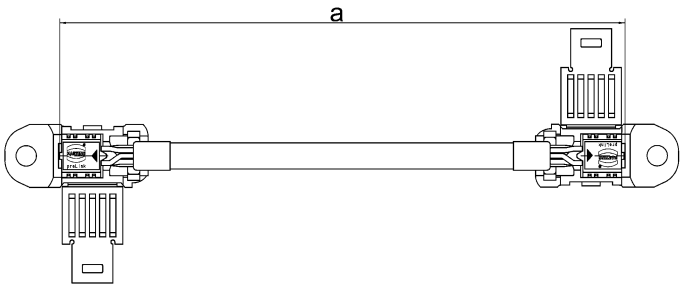
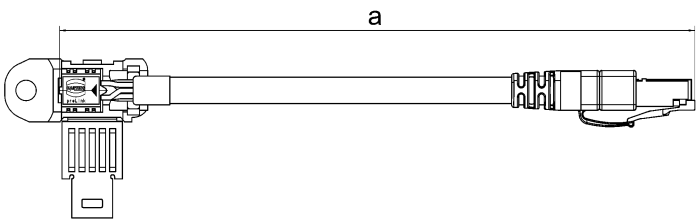
- Pre-assembled system cable
- Fast, flexible and reliable in the application
- Simple in handling
- Robust in design
- Installation of preLink® cables for industrial environment
- Connection cable for control or distributor cabinets or within controllers
- The preLink® termination block can be terminated to all preLink® components like the RJ45 or the M12 X- and D-coded plugs and jacks

Technical characteristics

Cable types	4 x 2 AWG 27/7, shielded, S/FTP Cat. 7
Sheath material	PUR
Wiring	TIA/EIA 568B, 1:1
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Copper braid, tinned
Operating temperature range fixed operation flexible operation	 –35 °C … +70 °C –5 °C … +50 °C
Colour	Yellow

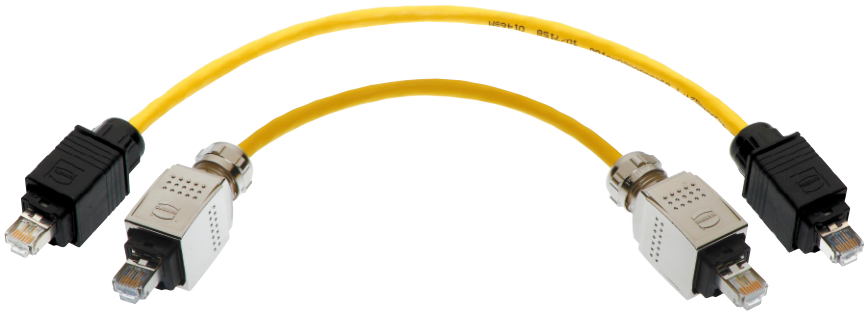


preLink® patch cable

Identification			Part number	Drawing	Dimensions in mm
preLink® patch cable			Yellow		
terminal module to both sides, secured by protection cap I	Length	0.2 m	20 82 600 2002		
		0.4 m	20 82 600 2004		
		0.6 m	20 82 600 2006		
		0.8 m	20 82 600 2008		
		1.0 m	20 82 600 2010		
		2.0 m	20 82 600 2020		
		3.0 m	20 82 600 2030		
		4.0 m	20 82 600 2040		
		5.0 m	20 82 600 2050		
		10.0 m	20 82 600 2100		
Side 1 with terminal module, secured by protection cap Side 2 RJ45 overmoulded, with locking lever protection II	Length	0.2 m	20 82 601 1002		
		0.4 m	20 82 601 1004		
		0.6 m	20 82 601 1006		
		0.8 m	20 82 601 1008		
		1.0 m	20 82 601 1010		
		2.0 m	20 82 601 1020		
		3.0 m	20 82 601 1030		
		4.0 m	20 82 601 1040		
		5.0 m	20 82 601 1050		
		10.0 m	20 82 601 1100		

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 8-wire



Han® PushPull RJ45 system cable, 8-wire

Features

- Connector types: Han® PushPull RJ45 (V14)
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: PUR

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Standardised PushPull interface for IP65 / IP67
- Especially space-saving
- AIDA compliant
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

Connector types	Han® PushPull RJ45
Cable type	4 x 2, Twisted Pair, shielded
Sheath material	PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6
Transmission rate	10 / 100 Mbit/s 1 / 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C … +70 °C
Colour	Green / Yellow

Identification		Part number Plastic	Part number Metal	Part number Metal
Han® PushPull RJ45 system cable, 8-wire		Yellow	Yellow	PROFINET Green
	Length 1.5 m	09 47 575 7001	09 47 585 8001	09 48 171 7165 015
	3.0 m	09 47 575 7002	09 47 585 8002	09 48 171 7165 030
	5.0 m	09 47 575 7003	09 47 585 8003	09 48 171 7165 050
	10.0 m	09 47 575 7004	09 47 585 8004	09 48 171 7165 100
	20.0 m	09 47 575 7005	09 47 585 8005	09 48 171 7165 200

Other cable lengths on request

Han® 3 A RJ45
system cable, 8-wire

Features

- Connector types: Han® 3 A RJ45 (V5)
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- Industrial Cabling
- Between I/O and controllers
- On machines and control units

Benefits

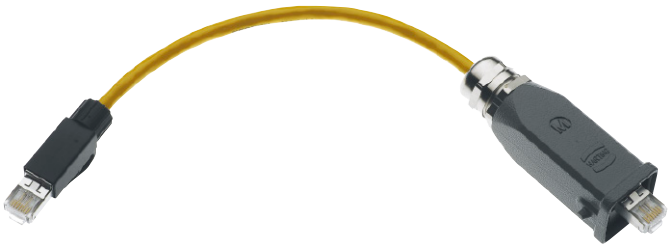
- Transmission of up to 10 Gbit/s
- Very robust RJ45 cord
- Complete IP65/IP67 rated
- ISO/IEC 11 801 compliant

Technical characteristics

Connector types	Han® 3 A RJ45
Cable types	4 x 2, Twisted Pair, shielded
Sheath material	PVC / PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C … +70 °C
Colour	Yellow

Identification	Part number PVC	Part number PUR	Drawing	Dimensions in mm
Han® 3 A RJ45 system cable, 8-wire	Yellow	Yellow		
Length 1.5 m	09 45 715 1523	09 45 715 1563		
3.0 m	09 45 715 1525	09 45 715 1565		
5.0 m	09 45 715 1527	09 45 715 1567		
10.0 m	09 45 715 1551	09 45 715 1572		
20.0 m	09 45 715 1553	09 45 715 1574		

Other cable lengths on request



Han® 3 A RJ45 system cable, 8-wire

Features

• Connector types	Han® 3 A RJ45 (V5) / RJ45 IP20
• Category	Cat. 6_A
• Number of wires	8
• Wiring	1:1
• Sheath material	PVC / PUR

Application

- Industrial Cabling
- Connection between generic cabling and machine cabling
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Very robust RJ45 cord
- Single sided IP65/IP67 rated
- ISO/IEC 11801 compliant
- PROFINET compliant

Technical characteristics

Connector types	Han® 3 A RJ45 (IP65/IP67) RJ45 (IP20)
Cable types	4 x 2, Twisted Pair, shielded
Sheath material	PVC / PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C to +70 °C
Colour	Yellow

Identification		Part number PVC	Part number PUR	Drawing	Dimensions in mm
Han® 3 A RJ45 system cable, 8-wire IP65/IP67 to IP20		Yellow	Yellow		
	Length 1.5 m	09 45 701 1564	09 45 701 1534		
	3.0 m	09 45 701 1566	09 45 701 1536		
	5.0 m	09 45 701 1568	09 45 701 1538		
	10.0 m	09 45 701 1573	09 45 701 1543		
	20.0 m	09 45 701 1575	09 45 701 1545		

Other cable lengths on request

Han® 3 A RJ45 Hybrid system cable, 8-wire, Outdoor, plastic

Features

- Connector types: Han® 3 A RJ45 (V5) Hybrid, plastic
- Category: Cat. 6_A
- Number of wires: 8 (data) + 4 (power)
- Wiring: 1:1
- Sheath material: PUR

Application

- Industrial Cabling
- Connection between generic cabling and machine cabling
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Use on-site made possible via IP65/IP67 protection
- Easy handling for applications with additional power supply
- PROFINET compliant

Technical characteristics

Connector types	Han® 3 A RJ45 Hybrid, plastic
Cable types	4 x 2, Twisted Pair, shielded + 4 x 1.5 power cores
Sheath material	PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6_A / Class E up to 500 MHz according to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C … +70 °C
Colour	Black
Data power supply Rated voltage Rated current	 48 V / DC 16 A

Identification	Part number PUR	Drawing	Dimensions in mm
Han® 3 A RJ45 Hybrid system cable, 8-wire	Black		
Length 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		

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 8-wire

Han® 3 A RJ45 Hybrid system cable, 8-wire, Outdoor, metal

Features

• Connector types	Han® 3 A RJ45 (V5) Hybrid, metal
• Category	Cat. 6_A
• Number of wires	8 (data) + 4 (power)
• Wiring	1:1
• Sheath material	PUR

Application

- Industrial Cabling
- Connection between generic cabling and machine cabling
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Use on-site made possible via IP65 / IP67 protection
- Easy handling for applications with additional power supply
- PROFINET compliant

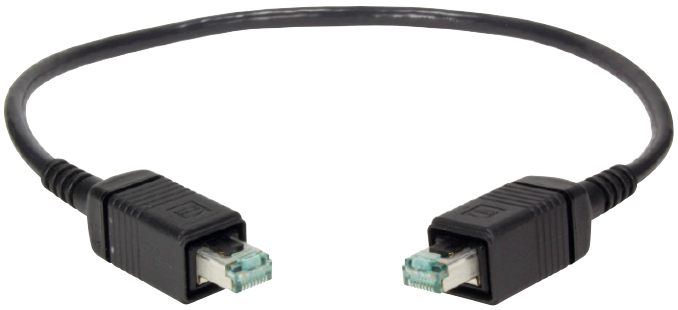
Technical characteristics

Connector types	Han® 3 A RJ45 Hybrid, metal
Cable types	4 x 2, Twisted Pair, shielded + 4 x 1.5 mm² power cores
Sheath material	PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6_A / Class E up to 500 MHz according to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10 / 100 Mbit/s 1 / 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	- 10 °C … +70 °C
Colour	Black
Data power supply Rated voltage Rated current	 48 V / DC 16 A

Identification	Part number PUR	Drawing	Dimensions in mm
Han® 3 A RJ45 Hybrid system cable, 8-wire Outdoor	Black		
Length 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		

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 8-wire



HARTING PushPull RJ45
system cable, 8-wire, straight

Features

- Connector types: HARTING PushPull RJ45 (V5)
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: PVC

Application

- Industrial Cabling
- Outdoor
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Double-sided IP65 / IP67 protection
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

Connector types	HARTING PushPull RJ45
Cable type	4 x 2 x AWG 26/7, Cat. 6_A
Sheath material	PVC
Wiring	8 pole, 1:1
Transmission performance	Category 6_A
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-20 °C … +70 °C
Colour	Yellow, black

Identification	Part number PVC	Part number Outdoor	Drawing	Dimensions in mm
HARTING PushPull RJ45 system cable, 8-wire	Yellow	Black		
Length 0.5 m		33 45 222 0050 002		
0.8 m	33 45 222 0080 001			
1.0 m	33 45 221 0010 001	33 45 221 0010 002		
5.0 m	33 45 221 0050 001	33 45 221 0050 002		
7.5 m		33 45 222 0750 002		
10.0 m		33 45 221 0100 002		
15.0 m		33 45 221 0150 002		
20.0 m		33 45 221 0200 002		

Other cable lengths on request

HARTING Ethernet cabling – RJ45 cords, 8-wire

HARTING PushPull RJ45
system cable, 8-wire, straight

Features

- Connector types: HARTING PushPull (V4)
  RJ45 / RJ45 IP20
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: PVC

Application

- Industrial Cabling
- Within switch cabinets
- On machines and control units

Benefits

- Transmission of up to 10 Gbit/s
- Easy interface between hard industrial areas to the protected IP20 environment
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

Connector types	HARTING PushPull RJ45 (IP65/IP67) RJ45 (IP20)
Cable type	S/FTP AWG 22/7, Cat. 6_A
Sheath material	PVC
Wiring	8 pole, 1:1
Transmission performance	Category 6_A
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-20 °C … +70 °C
Colour	Black

Identification	Part number PVC	Drawing	Dimensions in mm
HARTING PushPull RJ45 system cable, 8-wire IP65/IP67 on IP20	Black		
Length 1.0 m	33 45 421 0010 003		
2.0 m	33 45 421 0020 003		
3.0 m	33 45 421 0030 003		
5.0 m	33 45 421 0050 003		
7.0 m	33 45 421 0070 003		
10.0 m	33 45 421 0100 003		
15.0 m	33 45 421 0150 003		
20.0 m	33 45 421 0200 003		

Other cable lengths on request

HARTING PushPull RJ45
system cable, 8-wire, straight

Features

- Connector types: HARTING PushPull RJ45 (V4)
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: PUR

Application

- Industrial Cabling
- On machines and control units

Benefits

- Transmission of up to 100 Mbit/s
- Double-sided IP65 / IP67 protection
- Very large temperature range
- Easy and intuitive handling with HARTING PushPull technology

Technical characteristics

Connector types	HARTING PushPull RJ45 female and male
Cable type	S/FTP AWG 26/7, Cat. 6_A
Sheath material	PUR
Wiring	8 pole, 1:1
Transmission performance	Category 6_A
Transmission rate	10 / 100 Mbit/s 1 / 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-35 °C … +70 °C
Colour	Yellow

Identification	Part number PUR	Drawing	Dimensions in mm
HARTING PushPull RJ45 system cable, 8-wire	Yellow		
Length 0.5 m	33 45 232 0050 003		
1.0 m	33 45 232 0100 003		
2.0 m	33 45 232 0200 003		
3.0 m	33 45 232 0300 003		
5.0 m	33 45 232 0500 003		
7.5 m	33 45 232 0750 003		
10.0 m	33 45 232 1000 003		

Other cable lengths on request

HARTING M12
system cable, 4-wire, straight

Features

- Connector types: M12 D-coding
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- For harsh industrial environments
- Pre-assembled on both sides

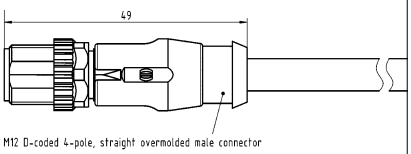
Benefits

- Robust design
- Use on-site made possible by IP65/IP67 protection
- PUR variants are useable as trailing cables and oil proof

Technical characteristics

Connector types	2x HARTING M12 D-coding, overmoulded
Cable types	4 x AWG 22/7, Star quad, double shielding
Sheath material	PVC / PUR
Wiring	4 pole, 1:1
Transmission performance	Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-25 °C … +70 °C
Colour	Green

Identification	Part number PUR	Part number PVC	Drawing	Dimensions in mm
HARTING M12 system cable, 4-wire	Green	Green		
Length 1.0 m	21 34 929 2477 010	21 34 929 2405 010		
1.5 m	21 34 929 2477 015	21 34 929 2405 015		
3.0 m	21 34 929 2477 030	21 34 929 2405 030		
5.0 m	21 34 929 2477 050	21 34 929 2405 050		
7.5 m	21 34 929 2477 075	21 34 929 2405 075		
10.0 m	21 34 929 2477 100	21 34 929 2405 100		
20.0 m	21 34 929 2477 200	21 34 929 2405 200		



Other cable lengths on request

HARTING M12
system cable, 4-wire, angled
HARTING M12 connection cable, D-coding

Features

- Connector types: M12 D-coding
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PVC / PUR

Application

- For harsh industrial environments
- Pre-assembled on both sides

Benefits

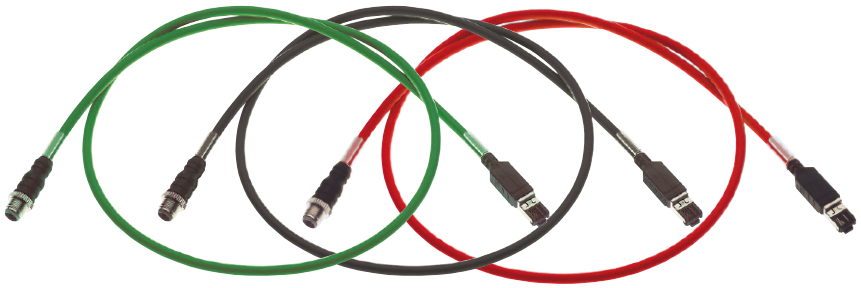
- Robust design
- Use on-site made possible by IP65/IP67 protection
- PUR variants are useable as trailing cables
- Oil proof

Technical characteristics

Connector types	2x HARTING M12 D-coding, angled, overmoulded
Cable types	4 x AWG 22/7, Star quad, double shielding
Sheath material	PVC / PUR
Wiring	4 pole, 1:1
Transmission performance	Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-25 °C … +70 °C
Colour	Green

Identification	Part number PUR	Part number PVC	Drawing	Dimensions in mm
HARTING M12 system cable, angled, 4-wire	Green	Green		
Length 1.0 m	21 34 949 4477 010	21 34 949 4405 010		
1.5 m	21 34 949 4477 015	21 34 949 4405 015		
3.0 m	21 34 949 4477 030	21 34 949 4405 030		
5.0 m	21 34 949 4477 050	21 34 949 4405 050		
7.5 m	21 34 949 4477 075	21 34 949 4405 075		
10.0 m	21 34 949 4477 100	21 34 949 4405 100		
20.0 m	21 34 949 4477 200	21 34 949 4405 200		

Other cable lengths on request



HARTING M12 / RJ45
system cable, 4-wire

Features

- Connector types: M12 D-coding - RJ45
- Category: Cat. 5
- Number of wires: 4
- Wiring: See technical characteristics
- Sheath material: PVC / PUR

Application

- HARTING M12 connection cable, D-coding, to RJ45 (IP20), overmoulded

Benefits

- Robust design
- PUR variants are useable as trailing cables
- PROFINET compliant

Technical characteristics

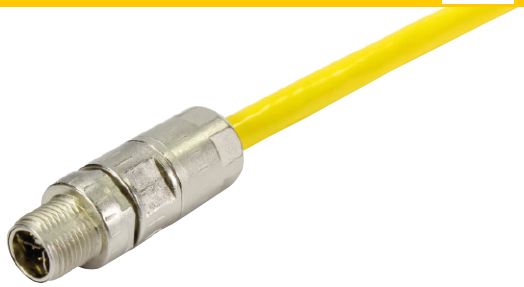
Connector types	HARTING M12 D-coding, overmoulded (IP65 / IP67) RJ45 4 pole, contacts 1/2 and 3/6, overmoulded (IP20)
Cable types	4 x AWG 22/7, Star quad, double shielding
Sheath material	PVC / PUR
Wiring	4 pole
Transmission performance	Cat. 5e / Class D up to 100 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-30 °C … +70 °C
Colour	Green / Black Red (SERCOS III)

Contact assignment

Signal	M12 D-coding	RJ45
TD+	1	1
TD-	3	2
RD+	2	3
RD-	4	6

Identification	Part number PUR	Part number PVC	Part number SERCOS III PUR
HARTING M12 / RJ45 system cable, 4-wire	Green	Black	Red
Length 1.0 m	09 45 700 5022	09 45 700 5063	09 47 220 2003 018
3.0 m	09 45 700 5025	09 45 700 5066	09 47 220 2005 018
5.0 m	09 45 700 5027	09 45 700 5068	09 47 220 2007 018
10.0 m	09 45 700 5051	09 45 700 5073	09 47 220 2012 018
20.0 m	09 45 700 5053	09 45 700 5075	09 47 220 2014 018

Other cable lengths on request



har-speed M12
system cable, 8-wire

Features

- Connector types: M12 X-coding
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: PVC

Application

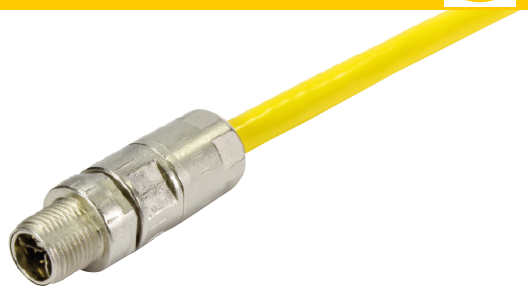
- *har*-speed M12 connector cable for IP65 / IP67 applications

Benefits

- Very robust metal housing M12 with degree of protection IP65
- Vibration proof crimp connection
- 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
- PROFINET compliant Type X mating face
- Oil proof acc. to EN 60 811-2-1

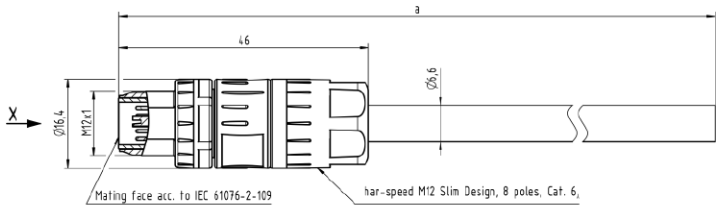
Technical characteristics

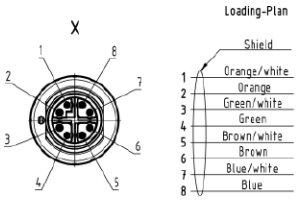
Connector types	*har*-speed M12 connector X coding acc. to IEC 61 076-2-109
Cable types	4 x 2, Twisted Pair, shielded
Sheath material	PVC
Wiring	8 pole, 1:1
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +70 °C
Colour	Yellow

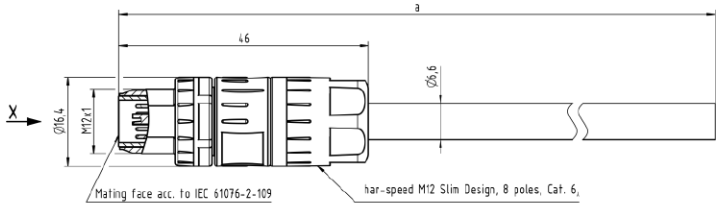


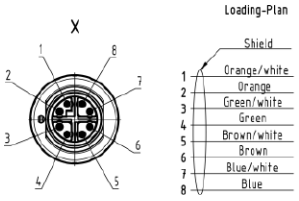
har-speed M12 system cable, 8-wire

Identification		Part number PVC	Drawing	Dimensions in mm
***har*-speed M12 system cable, 8-wire**				
one side assembled		Yellow		
Length	0.5 m	21 33 010 0850 005		
	1.0 m	21 33 010 0850 010		
	1.5 m	21 33 010 0850 015		
	2.0 m	21 33 010 0850 020		
	2.5 m	21 33 010 0850 025		
	5.0 m	21 33 010 0850 050		
	10.0 m	21 33 010 0850 100		
both sides assembled		Yellow		
Length	0.5 m	21 33 010 1850 005		
	1.0 m	21 33 010 1850 010		
	1.5 m	21 33 010 1850 015		
	2.0 m	21 33 010 1850 020		
	2.5 m	21 33 010 1850 025		
	5.0 m	21 33 010 1850 050		
	10.0 m	21 33 010 1850 100		

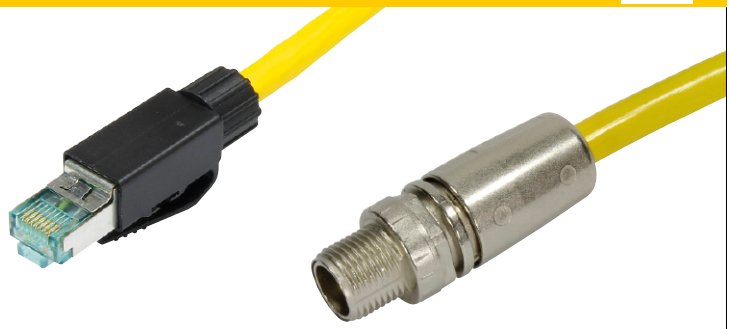








Other cable lengths on request



M12 / RJ45
system cable, 8-wire

Features

- Connector types: M12 X-coding to RJ45
- Category: Cat. 6_A
- Number of wires: 8
- Wiring: 1:1
- Sheath material: PVC

Application

- *har*-speed M12 connector cable for IP65/IP67 applications

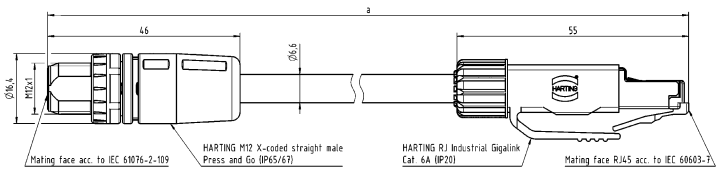
Benefits

- Very robust metal housing M12 with degree of protection IP65
- Vibration proof crimp connection
- 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
- PROFINET compliant Type X mating face

Technical characteristics

Connector types	*har*-speed M12 connector X coding acc. to IEC 61076-2-109 and RJ45 Gigalink
Cable types	4 x 2, Twisted Pair, shielded
Sheath material	PVC
Wiring	8 pole, 1:1
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +70 °C
Colour	Yellow

Identification		Part number PVC	Drawing	Dimensions in mm
M12 / RJ45 system cable, 8-wire		Yellow		
Length	0.5 m	09 48 932 3757 005		
	1.0 m	09 48 932 3757 010		
	1.5 m	09 48 932 3757 015		
	2.0 m	09 48 932 3757 020		
	2.5 m	09 48 932 3757 025		
	5.0 m	09 48 932 3757 050		
	7.5 m	09 48 932 3757 075		
	10.0 m	09 48 932 3757 100		

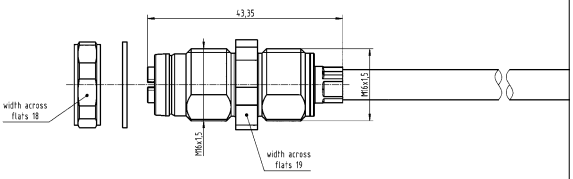


Other cable lengths on request

X-coding

Female, 8 poles

har-speed M12
Panel feed-throughs with cable

Identification	Part number	Drawing	Dimensions in mm
har-speed M12 PFT with cable 			
with 0.3 m cable “Cat. 7_A (2 x AWG 27/7) PIMF”. Other lengths on request	21 33 080 0850 003		
with 0.3 m cable “HA-VIS EtherRail Cat. 7 4 x (2 x AWG 24/7)”. Other lengths on request	21 33 070 0853 003		

Directory Chapter 02

Notes

All relevant copper cables that, in conjunction with HARTING's connectors (refer to chapter 03), support Fast Ethernet, Gigabit Ethernet and 10 Gigabit Ethernet are listed in the HARTING data cables chapter.

Specifically, these are:

- Four-wire data cables for Fast Ethernet (Category 5 for 100 Mbit/s) in accordance with PROFINET specification to IEC 61 784-5-3 and IEC 61 918

  PROFINET hybrid cables are assigned to the hybrid connectors in chapter 03

- Eight-wire data cables for Gigabit Ethernet (Category 5e or 6 for 1 Gbit/s and Category 6_A or 7 for 10 Gbit/s) according to ISO/IEC 11 801 and EN 50 173

  Hybrid cables are assigned to the hybrid connectors in chapter 03

HARTING data cables are specially designed to meet the requirements of industrial environments and work optimally when assembled together with HARTING connectors.

This combination ensures easy, quick and safe on-site installations.

All HARTING data cables are excellent for providing reliable Ethernet transmissions in extreme environmental conditions.

They are fully shielded and designed to transmit data in compliance with Category 5/5e (up to 100 MHz), or up to Category 7_A (up to 600 MHz).

The HARTING data cables are labelled with HARTING specific printing that includes the existing file listings (special testing proofs) and the HARTING raw cable number.

The HARTING raw cable number is always the same for one cable type, even when the cable is sold in different packaging (lengths) or pre-assembled.

Thus, there is always a difference between the printed raw cable number and the HARTING article number on the label!

In any cabling facility, the cables play a crucial role. For the industrial or semi-industrial Ethernet-based applications considered in this catalogue, it is primarily symmetrical copper data lines (twisted pair and quads), hybrid cables (combined data and power supply lines up to 48 V) and fibre optic cables (fibre optic and POF) which are used.

Additional construction types (e.g. USB for service interfaces or MVB/WTB bus cables) are listed to complete the Ethernet cabling portfolios.

The customer‘s decision on which cables to use is based on the particular application (what is being transferred), the installation environment (where the cabling is being installed), the available connector systems (what terminating technology or connectors are being used with the cable) and any additional properties and tests required (long-term stability, fire testing, etc.).

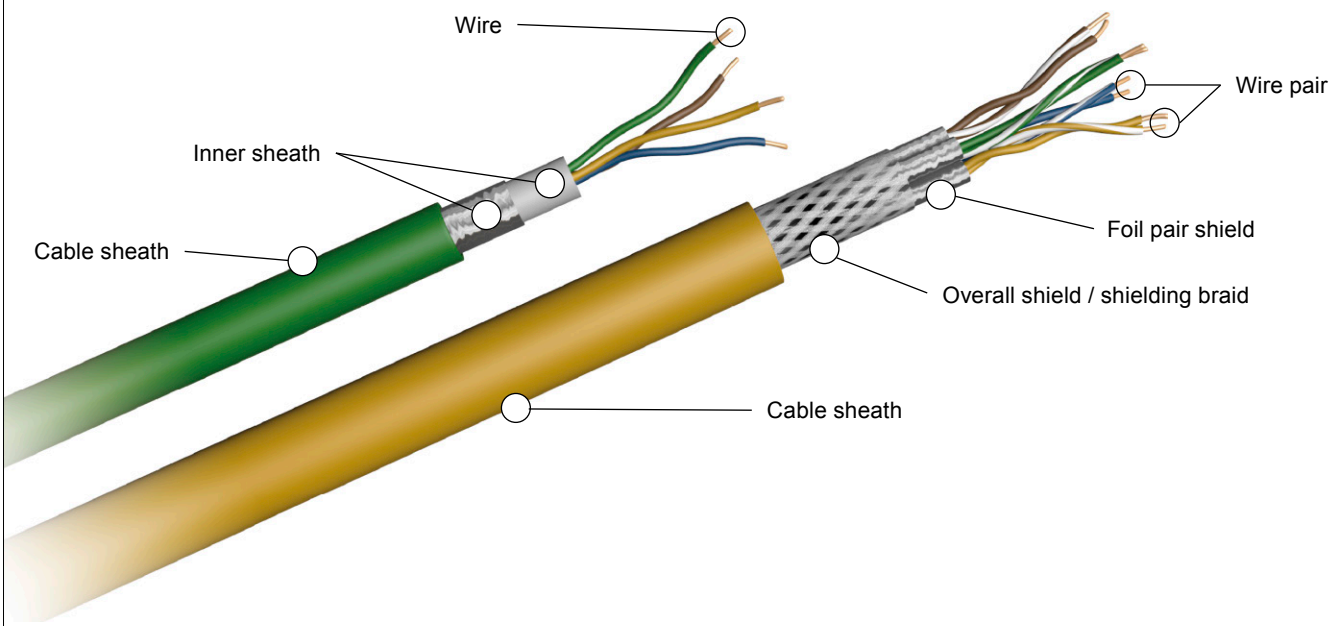
These requirements result in the specifications for the cable, which must always correlate with the cable‘s termination technique (IDC, preLink®, crimp, piercing or terminal for copper) and its connector (SC, LC, etc. for fibre optic; M12, RJ45 or Han® for copper). The specification for the data cable, created in this way, then determines which cable should be used. Each customer can create this cable specification by answering the following questions related to the customer‘s own application:

1. Will you be using copper, hybrid or fibre optic cables?

- The range of copper data and hybrid cables is generally limited to 100 metres. When using smaller wire cross-sections (e.g. AWG 26), the length decreases to approximately 40 metres. These cables are shielded to ensure operational safety and compatibility with EMC requirements.
- Fibre optic cables are always used when longer distances have to be bridged or when it would be very difficult to implement the proper shield and ground. Multi-mode cables are designed for distances up to 2 km. Single-mode cables offer a wider range and greater transmission capacity (also refer to bandwidth-length product). POF cables are very easy to assemble on site. Their range is limited, depending on their type, to 50 to 60 metres.

2. What will be transmitted?

- When transmitting Ethernet-based services or protocols with copper lines, you must select the proper category (this of course also applies to the connector being used):
- If fibre optic cables are being used for transmitting Ethernet-based services, then the specifications can be made according to the “Excerpt from ISO/IEC 11 801” table below.



Design of PROFINET star quad (green) and TP cable 4-wire S / FTP -PiMF (yellow)

Category	Bandwidth	Ethernet	Transmission speed	Required number of wires	Transmission class
5	100 MHz	Fast Ethernet	100 Mbit/s	4	D
5/5e	100 MHz	Gigabit Ethernet	1.000 Mbit/s	8	D
6	250 MHz	Gigabit Ethernet	1.000 Mbit/s	8	E
6_A	500 MHz	10 GB Ethernet	10.000 Mbit/s	8	E_A
7	600 MHz	10 GB Ethernet	10.000 Mbit/s	8	F
7_A	1.000 MHz	(40 GB Ethernet)	40.000 Mbit/s	8	F_A

- When using POF, the transmitted automation profile is in accordance with IEC 61784-5-x (CP or CPF = Communication Profile or Communication Profile Family). For PROFINET in accordance with IEC 61 784-5-3, 1 mm polymer optical fibre is used.

3. Where will the cables be installed?

Our users know their installation environment best. The proper cable is specified (in regards to wire/cable construction and sheath material) by properly selecting the requirements for the application and place of use. These specifications are cost-critical factors for ensuring the cable's proper operation and service life.

- Automation environment → Cable specification according to IEC 61784-5-x or **HARTING PROFINET cables** according to type A (fixed stationary installation), type B (non-stationary installation), type C (special constructions such as drag chain or torsion cable)
- Connection from a facility/automation island to IT → use **installation cable**
- Outdoor installations → use **HARTING outdoor cable**
- Installation in/on train → use **HARTING EtherRAIL® cable**
- Installation in bus or tram → use **HARTING cable in accordance with ISO 6722:2006** (UN ECE-R 118 Rev.1 + Amdm.1:2013-11)

4. Which connectors or terminating technique will you be using?

The use of certain connector types, if not already specified, is mainly determined by the application. HARTING offers all of the necessary connector types; they are listed in this catalogue according to their applications.

5. What additional requirements must the cabling meet?

If there are additional specific requirements, these need to be checked with the specifications for the cable being used. All of the primary requirements for data cables for special applications are already covered by HARTING's Ethernet cable product portfolio. HARTING's portfolio naturally

Network application	Max. channel insertion loss (dB)			ISO/IEC 11 801 channel supported by cabled optical fibre Category						
	Multi mode		Single mode	OM1		OM2		OM3/OM4	OS1/OS2	
	850 nm	1.300 nm	1.310 nm	850 nm	1.300 nm	850 nm	1.300 nm	850 nm	1.300 nm	1.310 nm
IEEE 802-3: 10Base-F Land FB	12.5 (6.8)			OF-2000		OF-2000		OF-2000		
IEEE 802-3: 1000Base-SX	2.6 (3.56)					OF-500		OF-500		
ISO/IEC 8802-3: 100Base-FX		11.0 (6.0)			OF-2000		OF-2000		OF-2000	
IEEE 802.3: 10GBase-LX4		2.00	6.20		OF-300		OF-300		OF-300	OF-2000

Excerpt from ISO/IEC 11 801

meets requirements for oil resistance, crush resistance and a wide temperature range for industrial-grade cables. But there may be other crucial requirements which are not covered by our standard designs and must be requested separately, such as resistance to welding beads, special hybrid constructions, etc.

Cable materials

Copper data cables consist of the core material (copper wires or strands, tinned or non-tinned), the core insulation (foamed or non-foamed plastics such as PVC or PE) foils and copper braids for shielding, possibly liners or inner shells (for PROFINET cable), fillers or tension elements, additional foils or layers, and the outer sheath.

All of these cable materials determine the electrical parameters (such as the category), as well as the mechanical, chemical and EMC characteristics.

Unlike connectors, cable may introduce a significant amount of material into a facility or cabling installation. This affects the flammability characteristics and fire loads.

Thus, the materials chosen for the core insulation and the sheath are very important.

The key characteristics of the cable sheath and its material are:

- PVC (polyvinyl chloride): lightweight, highly flexible (soft) material that can be processed well. Very resistant to oils and fats; prevalent in the industrial environment. PVC has a very high flame resistance. If a PVC soot material is added, this makes an excellent sheathing material for outer cable. The addition of soot inevitably leads to black colour and provides the necessary UV resistance for the cable.

  PVC is not halogen-free. The disadvantage is that it releases toxic gases during a fire and forms hydrochloric acid when combined with (extinguishing) water which can cause further damage.
- PUR (polyurethane): is a very robust material with excellent characteristics for industrial and industry-related applications. It is halogen-free and has outstanding oil resistance, chemical resistance and abrasion resistance. It also has good flame resistance and is suitable for non-stationary applications.
- PE (polyethylene): has many characteristics similar to PUR, but worse oil resistance and chemical resistance. It is extremely anti-hygroscopic (limited absorption with surrounding water) and safe for use in food processing applications, so it is well suited for HARTING‘s F+B portfolio.

  Elastomer materials (which are similar to PE) have been developed for use in HARTING EtherRail® cables. The elastomer is irradiated, which provides the cable with its excellent temperature and fire characteristics.
- FRNC (Flame Retardant Non-Corrosive) thermoplastic polyolefine: a halogen-free material with excellent flame resistance. FRNC cables can be readily processed and are widely used in structured building cabling (fixed routing, installation cables). For industrial applications, however, FRNC cables are rarely used because of their insufficient resistance to oil and chemicals.

The general term LSZH (Low Smoke Zero Halogen) is often used to describe cables for building installation and structured cabling. LSZH actually describes the properties of the cable sheath and not the real material composition.

Copper wires in data cables

The size, cross section and construction of the copper wire in data cables determine the electrical and hence also the transmission characteristics.

A distinction is made between hard core and stranded wires. Hard core wires are normally used for stationary installations where the cables hardly move. Stranded wires consist of several individual strands. This is used for making flexible and highly flexible cables; it is well suited for use in non-stationary applications.

The size of the copper wires is indicated in AWG (American Wire Gauge). An overview of the sizes is provided below.

As the wire cross section increases (smaller AWG numbers), the signal attenuation in the cable (IL = Insertion Loss) lowers and the range of the data cable lengthens. This is why PROFINET cables (e.g. type A with four AWG22/1 wires) operate with a 100 metre range and why patch/connecting cables (with only AWG26/7 wire strands) are intended for 20 to 40 metre ranges.

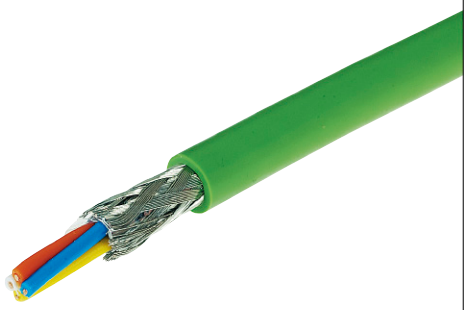
Type 1
(massive copper wire, excerpt from ASTM B286)

AWG					Maximum DC resistance of 20 °C			
AWG specification	Cross-sectional area		Nominal diameter		Tinned surfaces		Bare copper wires or silver-plated surfaces	
	cmils	mm²	in.	mm	Ω/1000 ft	Ω/km	Ω/1000 ft	Ω/km
22	640	0.324	0.0253	0.643	17.2	56.430	16.5	54.133
24	404	0.205	0.0201	0.511	27.2	89.238	26.2	85.958
26	253	0.128	0.0159	0.404	44.5	145.997	41.9	137.467
28	159	0.081	0.0126	0.320	70.8	232.283	66.8	219.160

Type 2
(stranded copper wire, excerpt from ASTM B286)

Wire construction								Max. DC resistance of 20 °C			
AWG specification	Number of wire cores	Diameter of the individual wires		Calculated cross-sectional area		Maximum permitted diameter		Tinned surfaces		Bare copper wires or silver-plated	
		in.	mm	cmils	mm²	in.	mm	Ω/1000 ft	Ω/km	Ω/1000 ft	Ω/km
22-19	19	0.0063	0.160	754	0.382	0.033	0.84	15.9	52.165	14.8	48.556
22- 7	7	0.0100	0.254	700	0.355	0.031	0.79	16.7	54.790	15.6	51.181
24-19	19	0.0050	0.127	475	0.241	0.027	0.69	25.4	83.333	23.6	77.428
24- 7	7	0.0080	0.203	448	0.227	0.025	0.64	26.2	85.958	24.5	80.381
26-19	19	0.0040	0.102	304	0.154	0.022	0.56	40.1	131.56	37.3	122.37
26- 7	7	0.0063	0.160	278	0.141	0.020	0.51	42.6	139.76	39.7	130.24
28-19	19	0.0031	0.079	183	0.093	0.017	0.43	67.7	222.11	63.1	207.02
28- 7	7	0.0050	0.127	175	0.089	0.016	0.40	68.2	223.75	63.6	208.66

Cross sections of copper wires



Industrial Cat. 5e standard cable, 4-wire
Type A

Features

- Sheath material: PVC
- Category: 5
- Number of wires: 4
- Wire design: AWG 22/1
- Wire diameter: 6.5 mm

Application

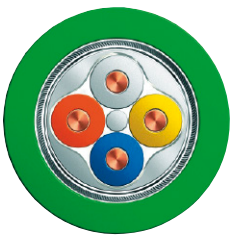
- For permanent installation or to build-up PROFINET system cable

Benefits

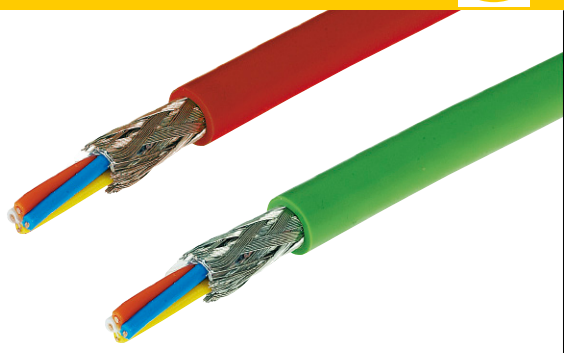
- Robust design suitable for industry
- PROFINET compliant
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

Technical characteristics

Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/1, solid
Wire insulation	PE, Ø 1.5 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C … +75 °C
Colour	Green
Printing	HARTING specific printing

Identification	Part number PVC	Drawing	Dimensions in mm
Industrial Cat. 5e standard cable Type A, 4-wire	Green		
20 m ring	09 45 600 0130		
50 m ring	09 45 600 0140		
100 m ring	09 45 600 0100		
500 m drum	09 45 600 0110		

Other cable lengths on request



Industrial Cat. 5e stranded cable, 4-wire
Type B

Features

- Sheath material: PVC / PUR
- Category: 5
- Number of wires: 4
- Wire design: AWG 22/7
- Wire diameter: 6.5 mm

Application

- To build-up PROFINET / SERCOS III system cable

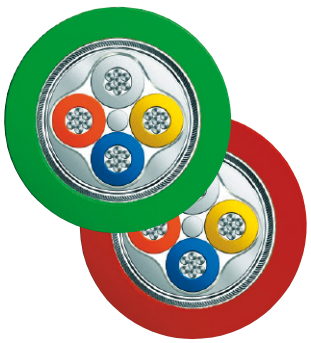
Benefits

- Robust design suitable for industry
- PROFINET compliant (Green)
- SERCOS III compliant (Red)
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

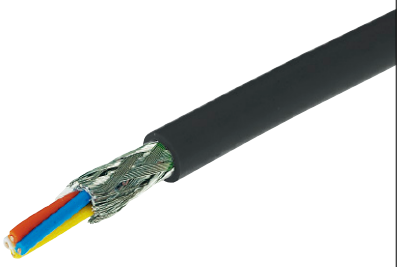
Technical characteristics

Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/7, tinned copper wire, stranded
Wire insulation	PE, Ø 1.56 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C … +70 °C
Colour	Green (PROFINET) Red (SERCOS III)
Printing	HARTING specific printing

Identification	Part number PUR	Part number PVC	Part number SERCOS III PVC	Drawing	Dimensions in mm
Industrial Cat. 5e stranded cable Type B, 4-wire	Green	Green	Red		
20 m ring	09 45 600 0139	09 45 600 0132	09 45 600 0134		
50 m ring	09 45 600 0149	09 45 600 0142	09 45 600 0144		
100 m ring	09 45 600 0109	09 45 600 0102	09 45 600 0104		
500 m drum	09 45 600 0119	09 45 600 0112	09 45 600 0114		



Other cable lengths on request



Industrial Cat. 5e stranded cable, 4-wire,
Type B, outdoor

Features

• Sheath material	PVC
• Category	5
• Number of wires	4
• Wire design	AWG 22/7
• Wire diameter	6.5 mm

Application

- To build-up PROFINET system cable

Benefits

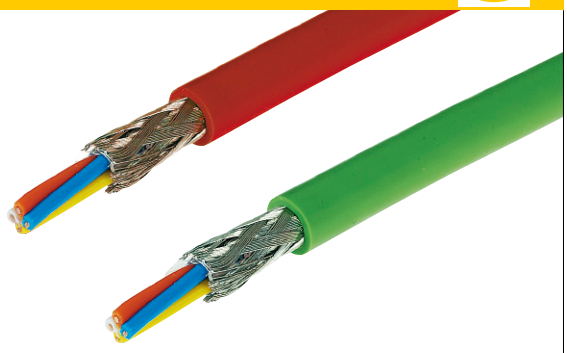
- Robust design suitable for industry
- PROFINET compliant
- UV protected
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

Technical characteristics

Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/7, stranded
Wire insulation	PE, Ø 1.56 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-45 °C … +60 °C
Colour	Black
Printing	HARTING specific printing

Identification	Part number PVC	Drawing	Dimensions in mm
Industrial Cat. 5e stranded cable, 4-wire, Type B, outdoor	Black		
20 m ring	09 45 600 0135		
50 m ring	09 45 600 0145		
100 m ring	09 45 600 0105		
500 m drum	09 45 600 0115		

Other cable lengths on request



Industrial Cat. 5e stranded cable, 4-wire,
useable as trailing cables,
Type C

Features

- Sheath material: PUR
- Category: 5
- Number of wires: 4
- Wire design: AWG 22/7
- Wire diameter: 6.5 mm

Application

- To connect to mobile equipment to build-up PROFINET / SERCOS III system cable

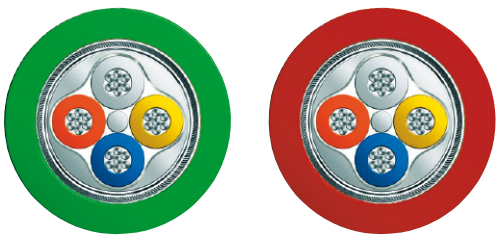
Benefits

- Robust design suitable for industry
- PROFINET compliant (Green)
- SERCOS III compliant (Red)
- Useable as trailing cables
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

Technical characteristics

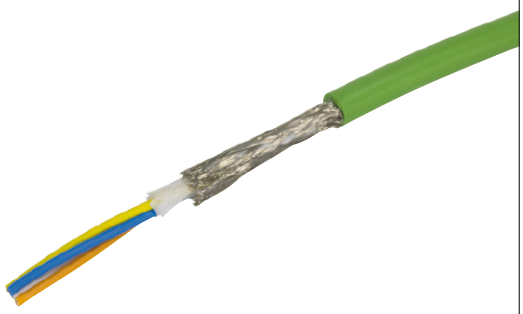
Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/7, stranded
Wire insulation	PE, Ø 1.5 mm
Sheath material	PUR
Cable sheath diameter	6.5 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C … +70 °C
Colour	Green (PROFINET) Red (SERCOS III)
Printing	HARTING specific printing

Identification	Part number PUR	Part number SERCOS III PUR	Drawing	Dimensions in mm
Industrial Cat. 5e stranded cable, 4-wire, useable as trailing cables, Type C	Green	Red		
20 m ring	09 45 600 0131	09 45 600 0137		
50 m ring	09 45 600 0141	09 45 600 0147		
100 m ring	09 45 600 0101	09 45 600 0107		
500 m drum	09 45 600 0111	09 45 600 0117		



Other cable lengths on request

Industrial Cat. 5e stranded cable, 4-wire,
useable as torsion cables,
Type C



Features

- Sheath material: PUR
- Category: 5
- Number of wires: 4
- Wire design: AWG 22/19
- Wire diameter: 6.3 - 6.7 mm

Application

- To connect to mobile equipment to build-up PROFINET system cable

Benefits

- Robust design suitable for industry
- PROFINET compliant (Green)
- Useable as torsion cables
- Easy stripping of cable sheath and screening braid with stripping tool 09 45 800 0000
- RoHS compliant

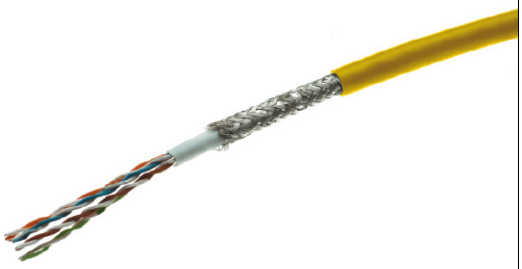
Technical characteristics

Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/19, stranded
Wire insulation	PE, Ø 1.52 mm
Sheath material	PUR
Cable sheath diameter	6.3 - 6.7 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C … +80 °C
Colour	Green (PROFINET)
Printing	HARTING specific printing

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 5e stranded cable, 4-wire, useable as torsion cables, Type C			
20 m ring	09 45 600 1110		
50 m ring	09 45 600 1120		
100 m ring	09 45 600 1130		
500 m drum	09 45 600 1140		

Other cable lengths on request

HARTING Ethernet cabling – Cables, 8-wire



Industrial Cat. 5e cable, stranded, 8-wire, PUR

Features

- Sheath material PUR
- Category 5e
- Number of wires 8
- Wire design AWG 26/7
- Wire diameter (6.5 … 6.9) mm

Application

- To build-up flexible connections (one- or two-sided assembled system cable)

Benefits

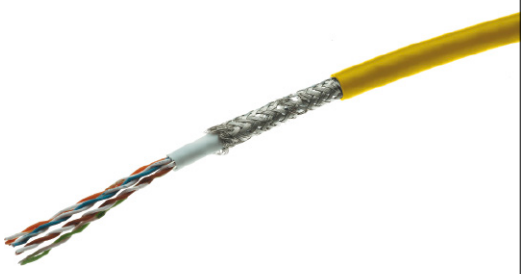
- Robust design suitable for industry
- Halogen free
- UL, AWM style 21 586
- Flame retardant
- Oil proof
- RoHS compliant
- With Fast Connect inside sheath

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.0 mm
Sheath material	PUR
Cable sheath diameter	6.5 mm … 6.9 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Foil screen and additional plaited cable
Operating temperature range	-10 °C … +60 °C
Colour	Yellow

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 5e stranded cable, 8-wire PUR			
20 m ring	09 45 600 0430		
50 m ring	09 45 600 0440		
100 m ring	09 45 600 0400		
500 m drum	09 45 600 0420		

Other cable lengths on request



Industrial Cat. 5e high flexible cable, 8-wire, PUR

Features

• Sheath material	PUR
• Category	5e
• Number of wires	8
• Wire design	AWG 26/19
• Wire diameter	6.8 mm

Application

- Trailing

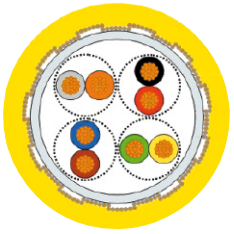
Benefits

- Robust design suitable for industry
- Usable as trailing cables in drag chains and fit for torsion strength
- Usable for transfer rate up to 1 Gigabit Ethernet
- Halogen free
- Flame retardant
- Free silicone oil
- RoHS compliant

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded
Core structure	4 x 2 x AWG 26/19
Wire insulation	PE, Ø 1.0 mm
Sheath material	PUR
Cable sheath diameter	6.8 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to EN 50288-2-2:2004, IEC 61156-6:2002
Transmission rate	10/100/1000 Mbit/s
Shielding	Overall screen of tinned copper braid
Operating temperature range	
fix operation	–40 °C … +85 °C
flexible operation	– 0 °C … +50 °C
Bending cycles	5 million
Colour	Yellow

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 5e installation cable, 8-wire PUR			
20 m ring	09 45 600 0136		
50 m ring	09 45 600 0146		
100 m ring	09 45 600 0106		
500 m drum	09 45 600 0156		



Other cable lengths on request

Industrial Cat. 5e stranded cable, 8-wire, PVC, Outdoor

Features

- Sheath material: PVC
- Category: 5e
- Number of wires: 8
- Wire design: AWG 26/7
- Wire diameter: (6.5 … 6.9) mm

Application

- To build-up flexible connections (one- or two-sided assembled system cable)

Benefits

- Robust design suitable for industry
- Applicable also for outside applications
- UL, AWM style 2969
- Flame retardant
- Weather proof
- UV resistant
- RoHS compliant
- With Fast Connect inside sheath

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.0 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm … 6.9 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Foil screen and additional plaited cable
Operating temperature range	-10 °C … +60 °C
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 5e stranded cable, 8-wire, outdoor PVC			
20 m ring	09 45 600 0230		
50 m ring	09 45 600 0240		
100 m ring	09 45 600 0200		
500 m drum	09 45 600 0220		

Other cable lengths on request

Industrial Cat. 6_A cable, stranded, 8-wire, PVC

Features

• Sheath material	PVC
• Category	6_A
• Number of wires	8
• Wire design	AWG 26/7
• Wire diameter	(6.3 … 6.9) mm

Application

• To build-up flexible connections
(one- or two-sided assembled system cable)

Benefits

• Robust design suitable for industry

• Optimal performance reserves

• , UL, AWM style 20 276

• Flame retardant

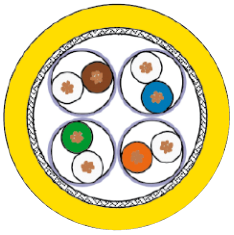
• RoHS compliant

• Best useable for all 8-wire HARTING RJ45 connectors

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.05 mm
Sheath material	PVC
Cable sheath diameter	6.3 mm … 6.9 mm
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-20 °C … +80 °C
Colour	Yellow

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 6_A cable, stranded, 8-wire PVC			
20 m ring	09 45 600 0532		
50 m ring	09 45 600 0542		
100 m ring	09 45 600 0502		
500 m drum	09 45 600 0522		



Other cable lengths on request

Industrial Cat. 6_A cable, stranded, 8-wire, PUR

Features

- Sheath material: PUR
- Category: 6_A
- Number of wires: 8
- Wire design: AWG 26/7
- Wire diameter: (6.3 … 6.9) mm

Application

- To build-up flexible connections (one- or two-sided assembled system cable)

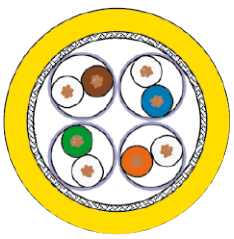
Benefits

- Robust design suitable for industry
- Optimal performance reserves
- Halogen free
- RoHS compliant
- Flame retardant

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.05 mm
Sheath material	PUR
Cable sheath diameter	6.3 mm … 6.9 mm
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-40 °C … +80 °C
Colour	Yellow

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 6_A cable, stranded, 8-wire PUR			
20 m ring	09 45 600 0630		
50 m ring	09 45 600 0640		
100 m ring	09 45 600 0600		
500 m drum	09 45 600 0620		



Other cable lengths on request

Industrial Cat. 6_A cable, stranded, 8-wire, PVC, Outdoor

Features

- Sheath material: PVC
- Category: 6_A
- Number of wires: 8
- Wire design: AWG 26/7
- Wire diameter: (6.3 … 6.9) mm

Application

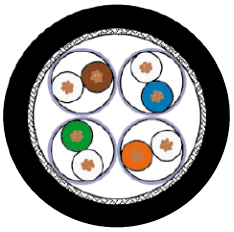
- To build-up flexible connections (one- or two-sided assembled system cable)

Benefits

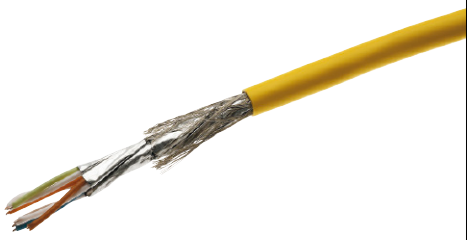
- Robust design suitable for industry
- Optimal performance reserves
- Usable for outdoor applications
- UV proof
- RoHS compliant
- UL, AWM style 20 276
- Flame retardant

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.05 mm
Sheath material	PVC
Cable sheath diameter	6.3 mm … 6.9 mm
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-20 °C … +80 °C
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 6_A stranded cable, 8-wire, Outdoor PVC			
20 m ring	09 45 600 0531		
50 m ring	09 45 600 0541		
100 m ring	09 45 600 0501		
500 m drum	09 45 600 0521		

Other cable lengths on request



Industrial Cat. 7_A cable, 8-wire, PUR

Features

- Sheath material: PUR
- Category: 7
- Number of wires: 8
- Wire design: AWG 23/1
- Wire diameter: 8.3 mm

Application

- To realize fixed connections, e.g. between control cabinet and industrial outlet (on-site installation of cabling for production halls, equipment or automation applications)

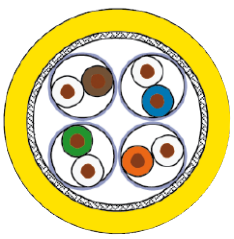
Benefits

- Robust design suitable for industry
- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- Flame retardant
- Oil retardant
- RoHS conform
- Halogen free

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 23/1, solid copper wire
Wire insulation	PE, Ø 1.4 mm
Sheath material	PUR Elastomer
Cable sheath diameter	8.3 mm
Transmission performance	Category 7_A / Class F_A up to 1200 MHz acc. to ISO/IEC 11 801 and EN 50 173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	
fix operation	–40 °C … +70 °C
flexible operation	–10 °C … +50 °C
Colour	Yellow

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 7_A installation cable, 8-wire PUR			
100 m ring	09 45 600 0651		
500 m reel	09 45 600 0650		
1000 m reel	09 45 600 0660		



Other cable lengths on request

Industrial data cable, 8-wire, Cat. 7_A, PUR

Features

- Sheath material: PUR
- Category: 7_A
- Number of wires: 8
- Wire design: AWG 26/7
- Wire diameter: (6.3 … 6.9) mm

Application

- To build-up flexible connections (one- or two-sided assembled system cable)

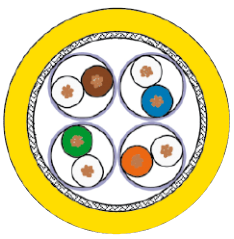
Benefits

- Robust design suitable for industry
- Optimal performance reserves
- Flame retardant
- Halogen free
- RoHS compliant
- Oil retardant

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.05 mm
Sheath material	PUR
Cable sheath diameter	6.3 mm … 6.9 mm
Transmission performance	Category 7_A / Class F_A up to 1200 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	
fix operation	–40 °C … +70 °C
flexible operation	–10 °C … +50 °C
Colour	Yellow

Identification	Part number	Drawing	Dimensions in mm
Industrial data cable 8-wire, Cat. 7_A PUR			
100 m ring	09 45 600 0711		
500 m reel	09 45 600 0721		
1000 m reel	09 45 600 0751		



Other cable lengths on request

Directory Chapter 03

All relevant data connectors that, in conjunction with HARTING's data cables (refer to chapter 02), support Fast Ethernet, Gigabit Ethernet and 10 Gigabit Ethernet are listed in the termination and connection technology chapter.

Housings, junction boxes, 19" rails and DIN rail distribution are also listed along with their complementary connectors.

All HARTING cabling solutions for Ethernet (and the corresponding termination and connection technology), are fully screened so they guarantee reliable data transmissions for all installation locations and under all operating conditions.

The HARTING Ethernet connectivity products come with insulation displacement technology (IDC) as well as with crimp technology; so they can be installed on-site at any time.

The preLink® is a special type of IDC termination technology developed by HARTING which enables you to quickly connect a terminating block in a single operation to all eight cable wires and then attach the desired connector (RJ45 or M12, male or female).

The RJ45 connectors are very important; they are constructed according to IEC 60 603-7-x (where x indicates the male/female version, so that Category 5 to 100 MHz, shielded → x = 3, Category 6 up to 250 MHz, shielded → x = 5 or Category 6_A to 500 MHz, shielded → x = 51).

RJ45 connectors are available in many different variants, especially for IP20 area applications. By adding the corresponding protective housing, the RJ45 connectors can be upgraded for use in IP65 / IP67 environments. These are then:

- RJ45 Han® PushPull (PROFINET interface)
- RJ45 Han® 3 A (a standard in the industry, PROFINET interface)
- RJ45 HARTING PushPull (interface for structured building cabling according to ISO/IEC 11 801), a space-saving variant
- RJ45 hybrid solutions (PROFINET interface)

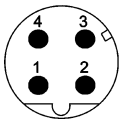
In addition to the RJ45, the M12 mating profile also plays an important role in Ethernet cabling. The M12 D-coded connector has been designed for the transmission of (four wire) Fast Ethernet. The M12 X-coded connector is best suited for transmitting Gigabit or 10 GB (eight wire) Ethernet. M12 connectors with crimp terminations also play a very important role in railway technology. All M12 connectors are IP65 / IP67 compatible.

Specifications

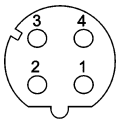
IEC 61 076-2-101, IEC 61 076-2-109, RoHS

M12 circular connectors

D-coding, mating face acc. to IEC 61 076-2-101

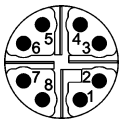


Male, 4 poles



Female, 4 poles

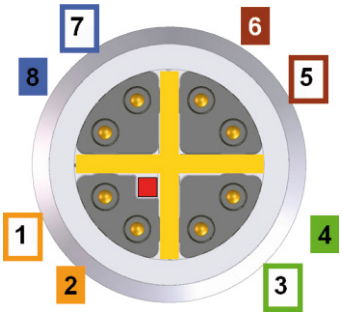
X-coding, mating face acc. to IEC 61 076-2-109



Male, 8 poles

Female, 8 poles

X-coding, mating face acc. to IEC 61076-2-109



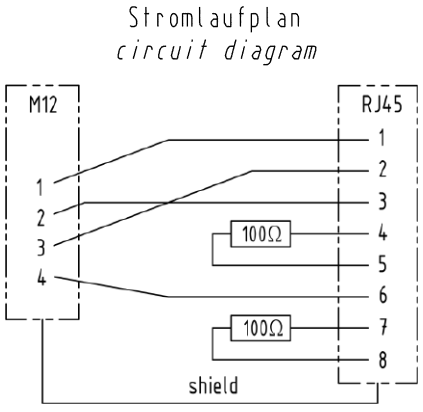
8 poles pin assignment

Signals		Pin assignment			Cable		
1/10Gbit	10/100 Mbit	RJ45	M12 D-coded	M12 X-coded	4-wire	568A	568B
BI_DA+	TxData+	1	1	1	yellow	white/green	white/orange
BI_DA-	TxData-	2	3	2	orange	green	orange
BI_DB+	RxData+	3	2	3	white	white/orange	white/green
BI_DC+	-	4	-	8		blue	blue
BI_DC-	-	5	-	7		white/blue	white/blue
BI_DB-	RxData-	6	4	4	blue	orange	green
BI_DD+	-	7	-	5		white/brown	white/brown
BI_DD-	-	8	-	6		brown	brown

Adapter M12/RJ45

4 poles pin assignment

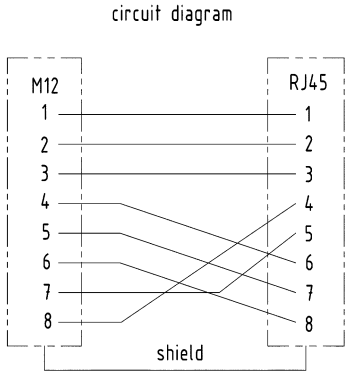
10/100 Mbit	RJ45	M12 D-coded	4-wire
TxData+	1	1	yellow
TxData-	2	3	orange
RxData+	3	2	white
RxData-	6	4	blue



Adapter M12/RJ45

8 poles pin assignment

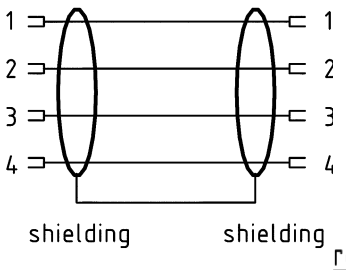
M12	RJ45
1	1
2	2
3	3
4	6
5	7
6	8
7	5
8	4



Gender changer

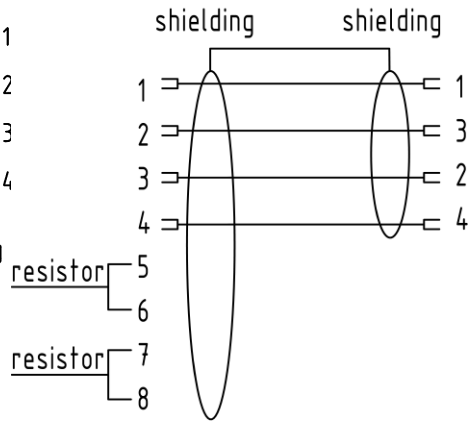
4 poles

schematic diagram



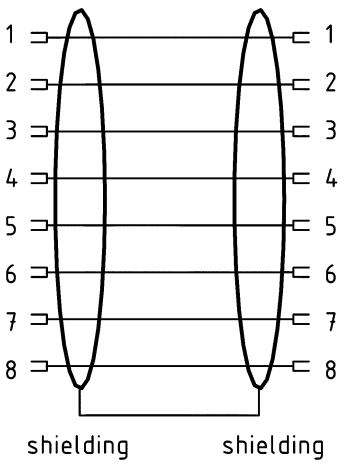
4 poles / 8 poles

schematic diagram



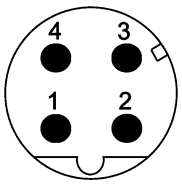
8 poles

schematic diagram



M12 connectors D-coding

Mating face



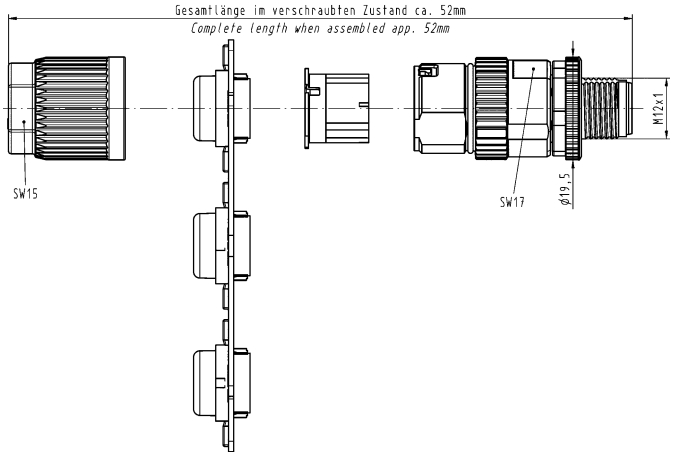
D-coding
Mating face
acc. to IEC 61076-2-101

Advantages

- D-coding for Ethernet/Profinet applications
- Robust design
- 360° screen contact
- Transmission performance acc. Cat. 5
- Field assembly by the use of ***HARAX***® IDC termination technology

Technical characteristics

Conductor cross section	0.14 - 0.34 mm², AWG 26-22 0.34 - 0.5 mm², AWG 22-20
Conductor insulation material	PVC/PE
Conductor diameter	1.2 - 2.0 mm
Cable diameter	4.5 - 8.8 mm
Temperature range	-40 °C … +85 °C
Degree of protection	IP65 / 67
Mating cycles	100
Tightening torque connector / Hexagonal wrench	0.6 Nm / SW 17
Rated current	4 A
Rated voltage	50 V
Contact resistance	10 mΩ
Insulation resistance	10^8 Ω
Transmission performance	Cat. 5
Contact material	Brass
Housing material	PA unreinforced

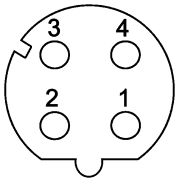
Identification	Part number	Drawing	Dimensions in mm
HARAX® M12-L, shielded			
 Male 4 poles, D-coding 0.14 - 0.34 mm², AWG 26 - 22	21 03 281 1405		
Male 4 poles, D-coding 0.34 - 0.5 mm², AWG 22 - 20	21 03 282 1405		

Connecting hardware

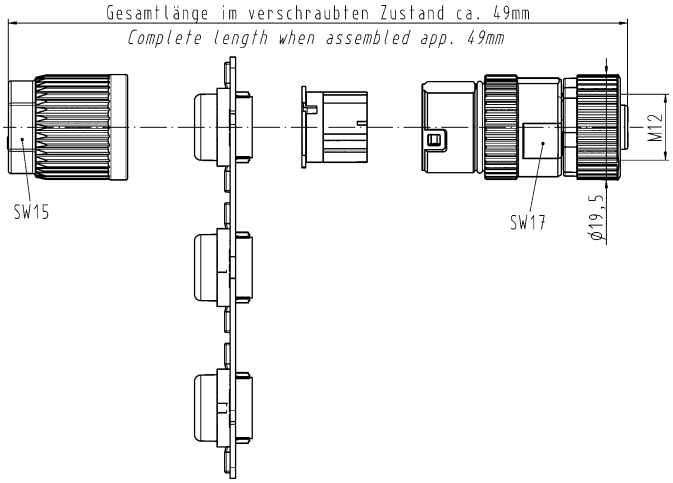
Further information and data sheets see www.HARTING.com

M12 connectors D-coding

Mating face

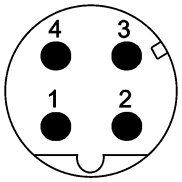


D-coding
Mating face
acc. to IEC 61076-2-101

Identification	Part number	Drawing	Dimensions in mm
HARAX® M12-L, shielded			
 Female 4 poles, D-coding 0.14 - 0.34 mm², AWG 26 - 22	21 03 281 2405		
Female 4 poles, D-coding 0.34 - 0.5 mm², AWG 22 - 20	21 03 282 2405		

Further information and data sheets see www.HARTING.com

Mating face

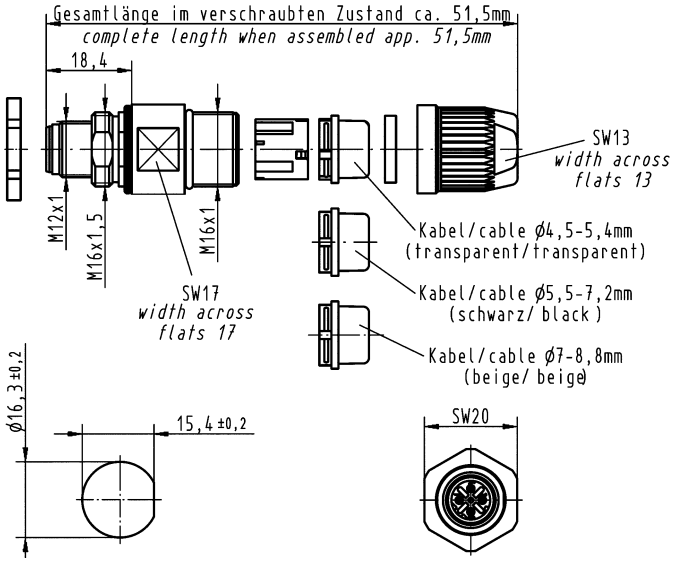


D-coding
Mating face
acc. to IEC 61076-2-101

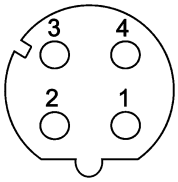
Identification	Part number	Drawing	Dimensions in mm
HARAX® Panel feed-through	21 03 381 1425		

Male
4 poles, D-coding
0.14 - 0.34 mm² / AWG 26 - 22

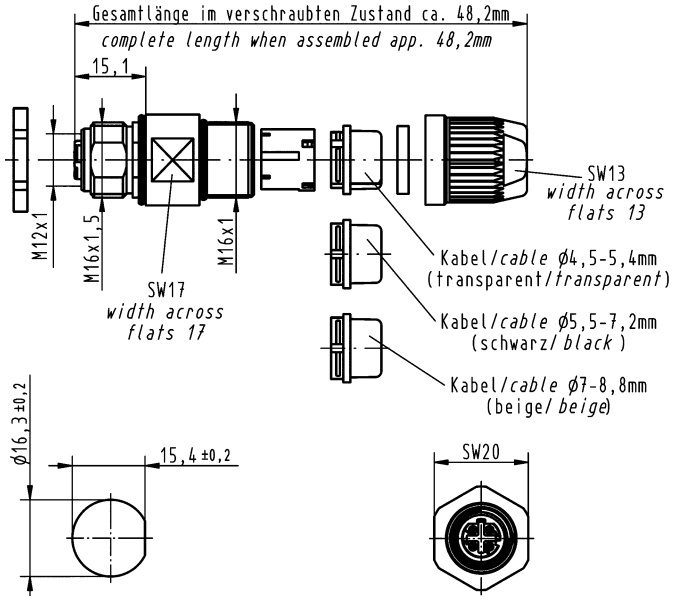
Panel thickness
min. 2.5 mm
max. 4.5 mm



Mating face

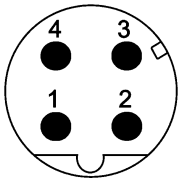


D-coding
Mating face
acc. to IEC 61076-2-101

Identification	Part number	Drawing	Dimensions in mm
HARAX® Panel feed-through  Female 4 poles, D-coding 0.14 - 0.34 mm² / AWG 26 - 22 Panel thickness min. 2.5 mm max. 4.5 mm	21 03 381 2425		

M12 connectors D-coding

Mating face



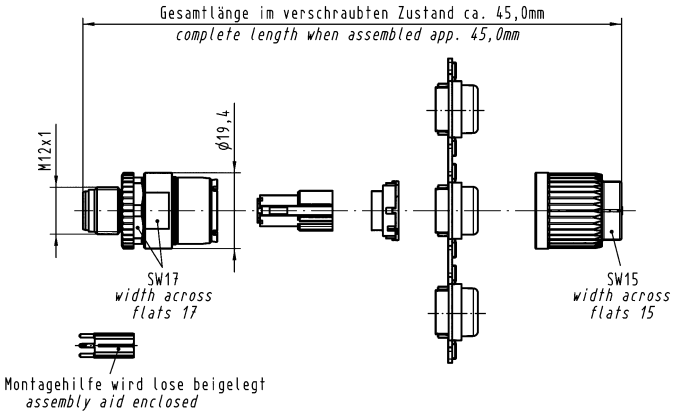
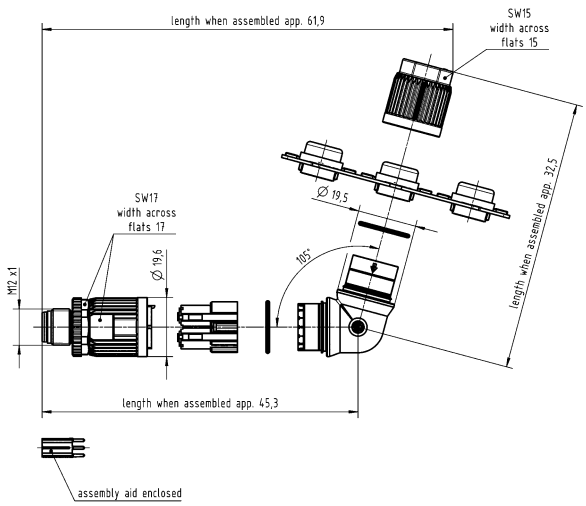
D-coding
Mating face
acc. to IEC 61076-2-101

Advantages

- D-coding for Ethernet/Profinet applications
- Robust design
- 360° screen contact
- Transmission performance acc. Cat. 5
- Very robust **crimp** termination technology

Technical characteristics

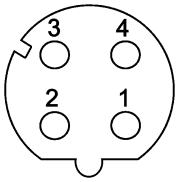
Conductor cross section	0.13 - 0.75 mm², AWG 26-18
Conductor diameter	2.0 - 2.3 mm
Cable diameter	4.5 - 8.8 mm
Temperature range	-40 °C … +85 °C
Degree of protection	IP67
Mating cycles	500
Tightening torque connector / Hexagonal wrench	0.6 Nm / SW 17
Rated current	4 A
Rated voltage	250 V
Contact resistance	10 mΩ
Insulation resistance	10^8 Ω
Transmission performance	Cat. 5
Contact material	Brass
Housing material	PA

Identification	Part number	Drawing	Dimensions in mm
M12 Crimp, shielded  Male 4 poles, D-coding	21 03 882 1415		
M12 Crimp, shielded  Male 4 poles, D-coding angled	21 03 882 3405		

Connecting hardware

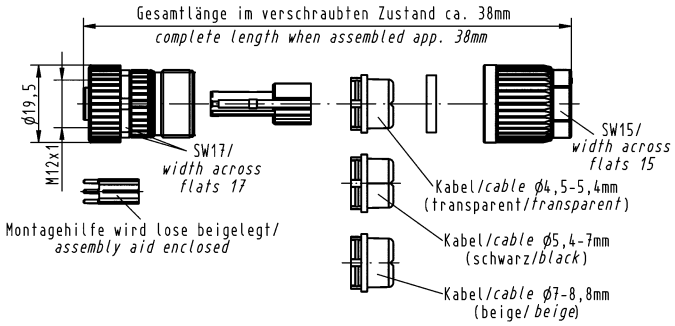
Further information and data sheets see www.HARTING.com

Mating face

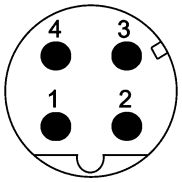


D-coding
Mating face
acc. to IEC 61076-2-101

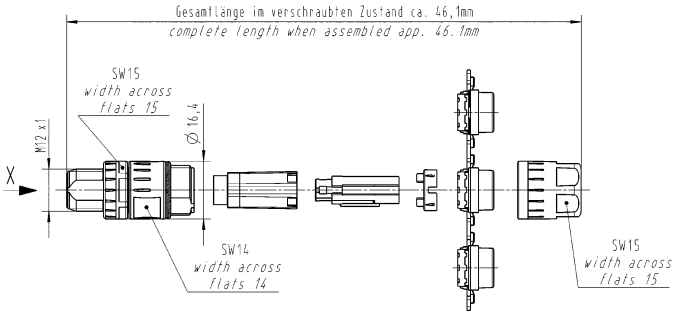
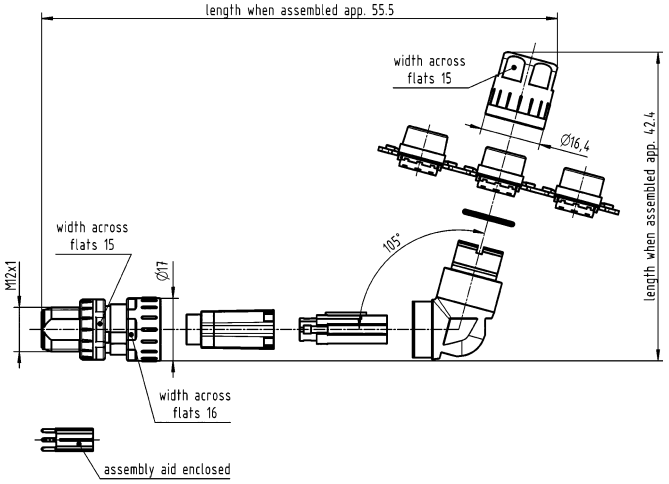
RoHS

Identification	Part number	Drawing	Dimensions in mm
M12 Crimp, shielded  Female 4 poles, D-coding	21 03 882 2405		

Mating face

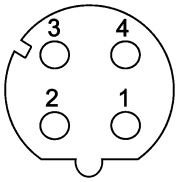


D-coding
Mating face
acc. to IEC 61076-2-101

Identification	Part number	Drawing	Dimensions in mm
M12 Crimp Slim design, shielded  Male 4 poles, D-coding Cable: 5.7 - 8.8 mm outer diameter	21 03 881 1405		
 Male 4 poles, D-coding angled	21 03 881 3405		

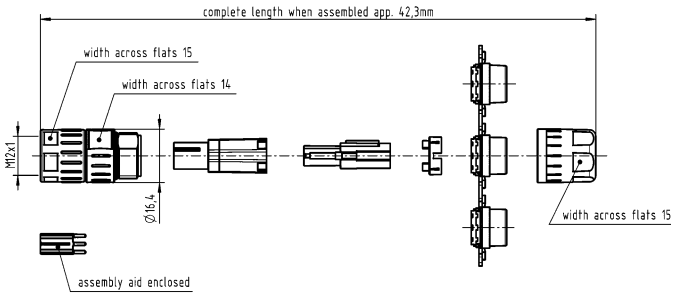
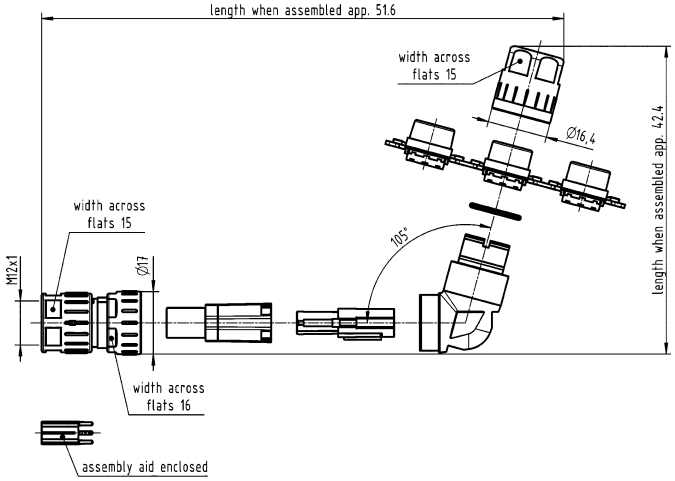
M12 connectors D-coding

Mating face



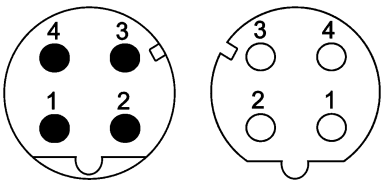
D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

Identification	Part number	Drawing	Dimensions in mm
M12 Slim Design			
 Female 4 poles, D-coding straight	21 03 881 2405		
 Female 4 poles, D-coding angled	21 03 881 4405		

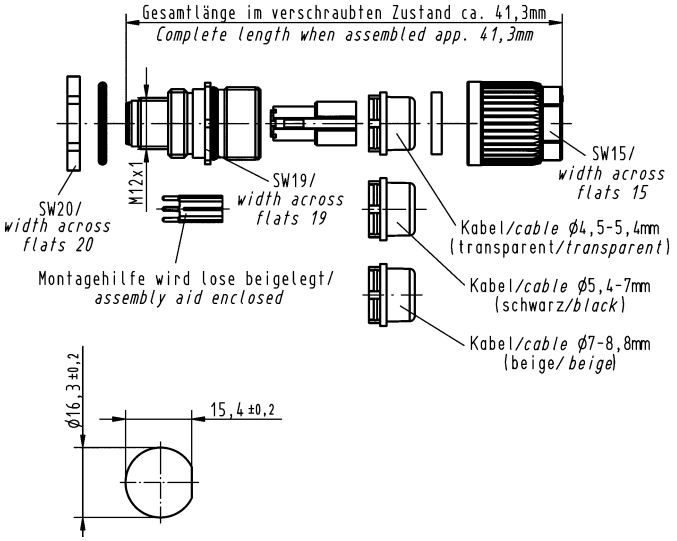
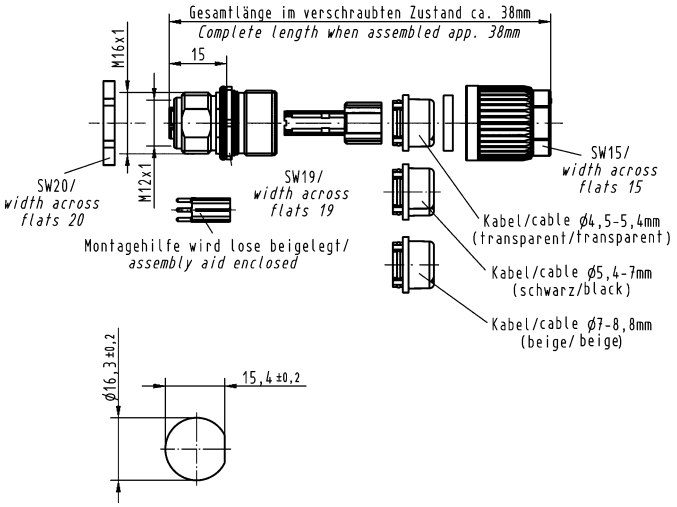
Further information and data sheets see www.HARTING.com

Mating face



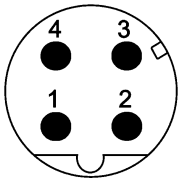
D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

Identification	Part number	Drawing	Dimensions in mm
M12 Panel feed-through Crimp  Male 4 poles, D-coding Panel thickness min. 2.5 mm max. 4.5 mm	21 03 882 1425		
M12 Panel feed-through Crimp  Female 4 poles, D-coding Panel thickness min. 2.5 mm max. 4.5 mm	21 03 882 2425		

M12 connectors D-coding

Mating face



D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

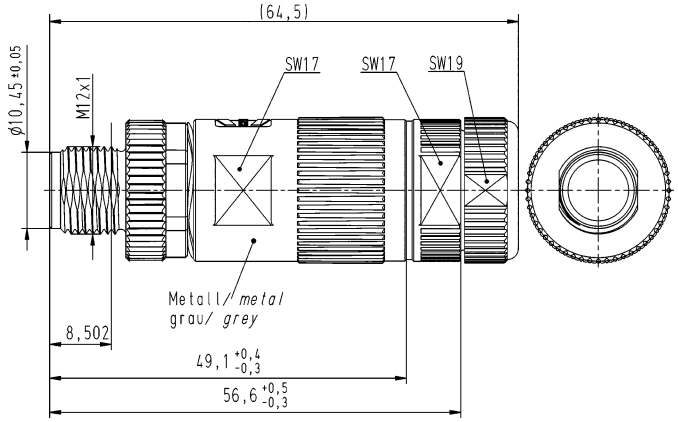
Advantages

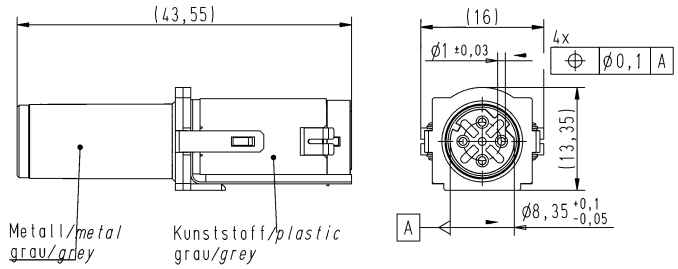
- D-coding for Ethernet/Profinet applications
- Robust design
- 360° screen contact
- Transmission performance acc. Cat. 5
- Very fast **preLink®** termination technology

Technical characteristics

Conductor cross section	0.10 - 0.34 mm², AWG 27-22
Conductor insulation material	PVC/PE
Conductor diameter	0.8 - 1.6 mm
Cable diameter	5.0 - 9.5 mm
Temperature range	-40 °C … +85 °C
Degree of protection	IP65/IP67
Mating cycles	250
Tightening torque connector / Hexagonal wrench	0.6 Nm / SW 17
Rated current	1 A
Rated voltage	48 V
Contact resistance	10 mΩ
Insulation resistance	10^8 Ω
Transmission performance	Cat. 5
Contact material	Brass
Housing material	Zinc die-cast

Identification	Part number	Drawing	Dimensions in mm
preLink® M12 housing	20 82 000 1210		
preLink® M12 male module Male 4 poles, D-coding	20 82 005 1214		

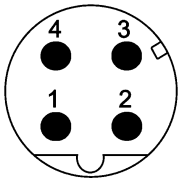




Connecting hardware

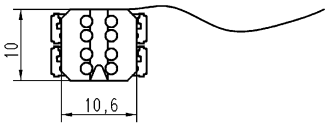
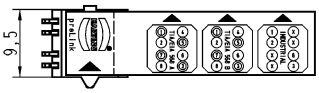
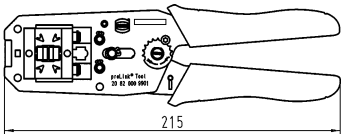
Further information and data sheets see www.HARTING.com

Mating face



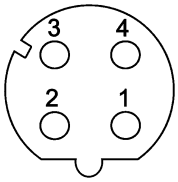
D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

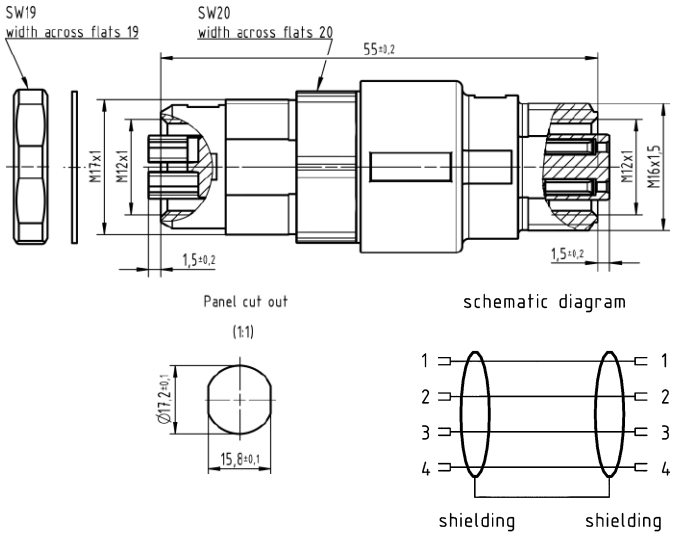
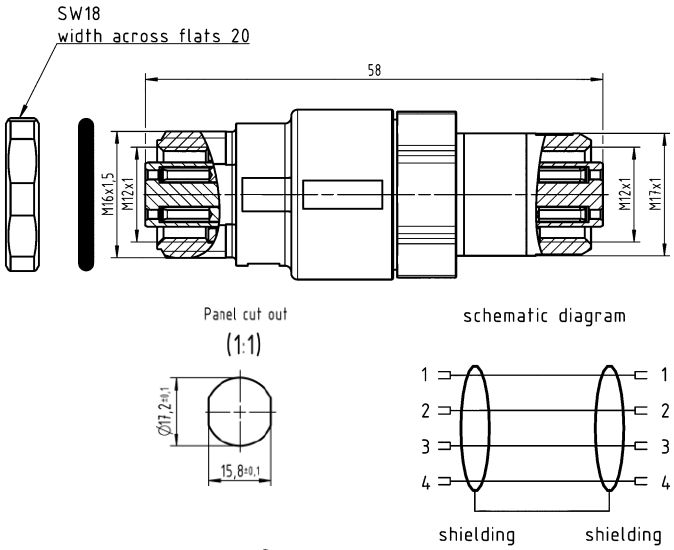
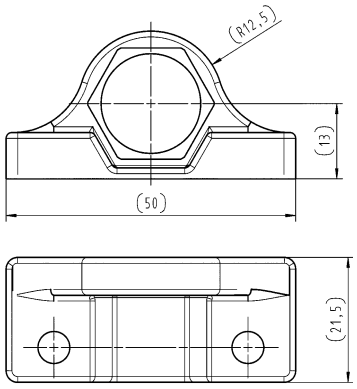
Identification	Part number	Drawing	Dimensions in mm
preLink® terminal module (Pack with 10 pieces) terminal block with IDC termination Number of contacts: 8 Conductor cross section: AWG 22/23 (24) solid and stranded Conductor diameter: Ø 1.3 - 1.6 mm Colour: yellow	20 82 000 0001		
Conductor cross section: AWG 26/27 solid and stranded Conductor diameter: Ø 0.8 - 1.1 mm Colour: white	20 82 000 0003		
Assembly tool	20 82 000 9901		

M12 connectors D-coding

Mating face

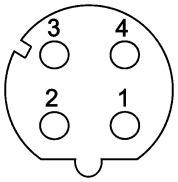


D-coding
Mating face
acc. to IEC 61076-2-101

Identification	Part number	Drawing	Dimensions in mm
M12 Gender changer Female-Female 4 poles, D-coding 8 poles, X-coding	21 03 381 6402		
M12 Gender changer Female-Female  4 poles, D-coding Cat. 5	21 03 381 6401		
Wall bracket 	21 01 000 0036		

M12 connectors D-coding

Mating face



D-coding
Mating face
acc. to IEC 61076-2-101

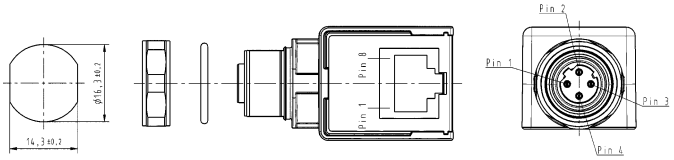
Identification	Part number	Drawing	Dimensions in mm

M12 Female-RJ45 Panel feed-through

4 poles, D-coding
angled

Panel thickness
min. 2.1 mm
max. 4.5 mm

21 03 381 4401*



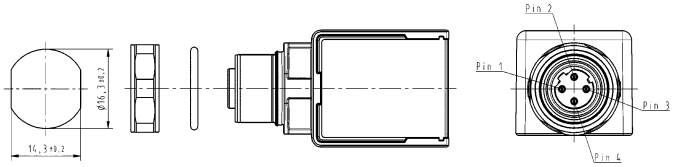
RJ45	M12 D-coded
1	1
2	3
3	2
6	4

M12 Female-RJ45 Panel feed-through

4 poles, D-coding
straight

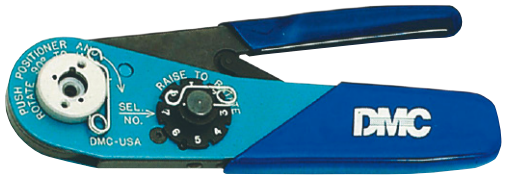
Panel thickness
min. 2.1 mm
max. 4.5 mm

21 03 381 2401*



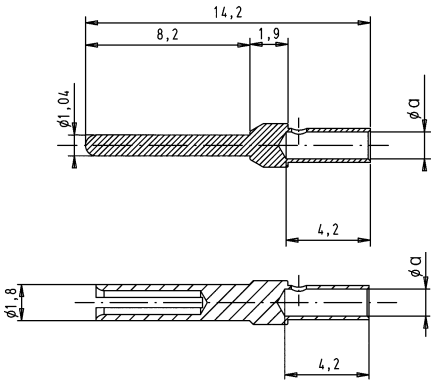
Connecting hardware

Further information and data sheets see www.HARTING.com
* UL approval is in preparation

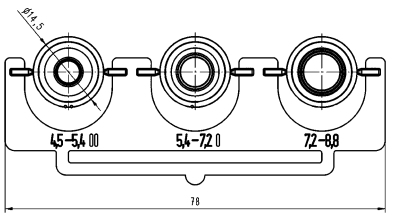
Identification	Part number	Drawing
Crimping tool for M12 Crimp	09 99 000 0501	
Accessories M12 Crimp		
Locator	09 99 000 0531	
D-Sub single contacts (500 mating cycles)		
turned male contacts		
AWG 22-18 / 0.33-0.82 mm²	09 67 000 3576	
AWG 24-20 / 0.25-0.52 mm²	09 67 000 8576	
AWG 26-22 / 0.13-0.33 mm²	09 67 000 5576	
AWG 28-24 / 0.09-0.25 mm²	09 67 000 7576	
turned female contacts		
AWG 22-18 / 0.33-0.82 mm²	09 67 000 3476	
AWG 24-20 / 0.25-0.52 mm²	09 67 000 8476	
AWG 26-22 / 0.13-0.33 mm²	09 67 000 5476	
AWG 28-24 / 0.09-0.25 mm²	09 67 000 7476	
M12 dynamometric screwdriver Tightening torque 0.6 Nm		
for M12 Slim design SW 15	09 99 000 0646	
for M12-L SW 17	09 99 000 0384	
Set of seals M12-L shielded for 4.5 - 5.4 mm cable Ø for 5.4 - 7.2 mm cable Ø for 7.2 - 8.8 mm cable Ø	21 01 010 2017	
Accessories M12		
Lock nut	21 01 000 0018	

D-Sub contacts

Part number	AWG	Tool settings
09 67 000 3x76	18	6
	20	6
	22	5
09 67 000 8x76	20, 22, 24	6
09 67 000 5x76	22, 24, 26	6

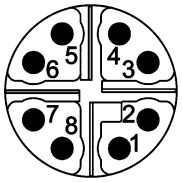


	a
AWG 22-18	1.34
AWG 24-20	1.13
AWG 26-22	0.88



M12 connectors X-coding

Mating face



X-coding
Mating face
acc. to IEC 61076-2-109

RoHS

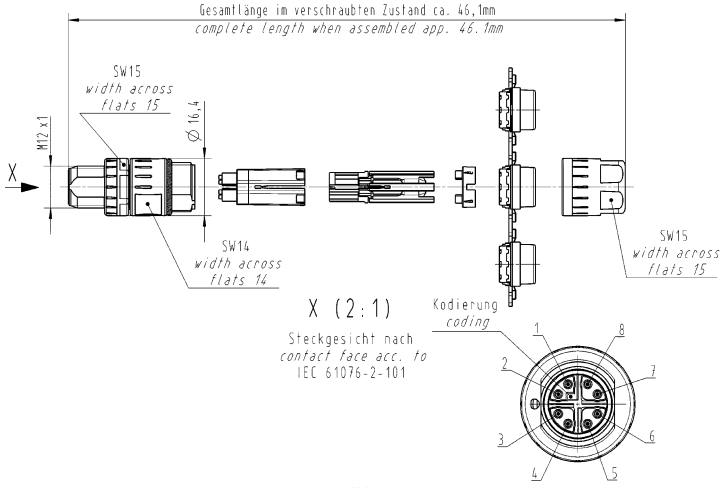
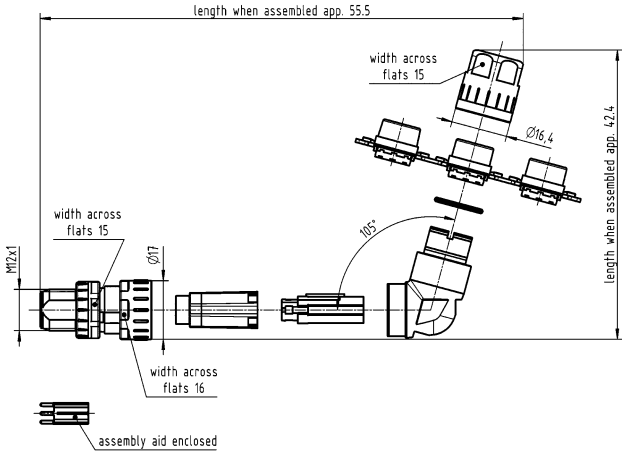
Advantages

- Maxiumum data rates through the configuration of the contacts in conformance with Ethernet technology. Transfer class E_A for 1 and 10 Gigabit
- Perfect shielding through paired shielding of the contacts
- Overmoulded system cables in various lengths
- Very robust **crimp** termination technology

Technical characteristics

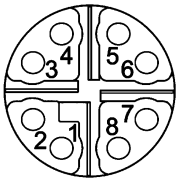
Conductor cross section	0.08 - 0.25 mm², AWG 28-23
Cable diameter	5.7 - 8.8 mm
Temperature range	-40 °C … +85 °C
Degree of protection	IP65/IP67
Mating cycles	500
Recommended tightening torque / Hexagonal wrench	0.6 Nm / SW 15
Rated current	0.5 A
Rated voltage	48 V
Transmission performance	Cat. 6_A
Contact material	Brass
Housing material	ZP410

Connecting hardware

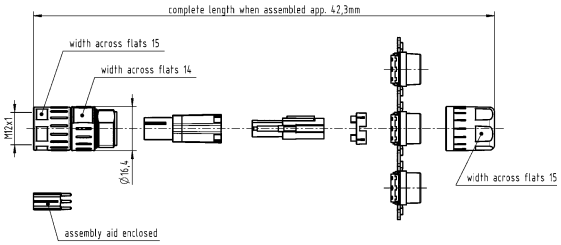
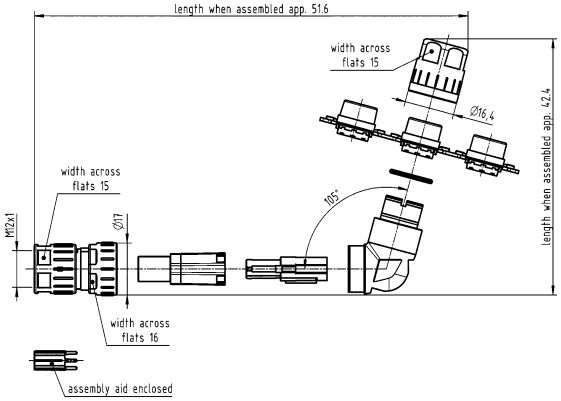
Identification	Part number	Drawing	Dimensions in mm
har-speed M12 Slim design			
 Male straight version 8 poles, Cat. 6_A Cable diameter: 5.7 - 8.8 mm	21 03 881 1805		
 Male angled version 8 poles, Cat. 6_A Cable diameter: 5.7 - 8.8 mm	21 03 881 3805		

Further information and data sheets see www.HARTING.com

Mating face

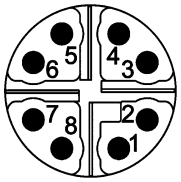


X-coding
Mating face
acc. to IEC 61 076-2-109

Identification		Part number	Drawing	Dimensions in mm
M12 Slim Design				
 Female, straight version	8 poles, X-coding 0.08 - 0.25 mm² AWG 28 - 23	21 03 881 2805		
Female, angled version	8 poles, X-coding 0.08 - 0.25 mm² AWG 28 - 23	21 03 881 4805		

PROFI INDUSTRIAL ETHERNET NET

Mating face



X-coding
Mating face
acc. to IEC 61076-2-109

preLink® M12 connector X-coding

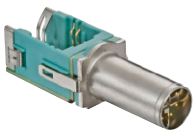
Advantages

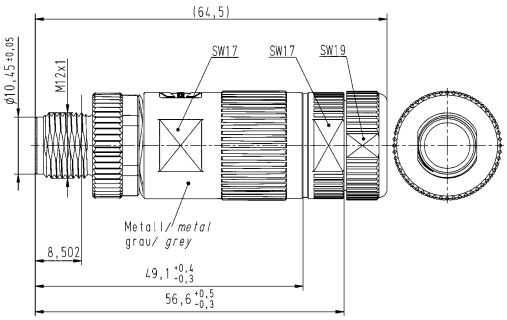
- M12 Ethernet-Data connector suitable for industry
- Robust design
- 360° shielding
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Very fast **preLink®** termination technology

Technical characteristics

Connector type	M12 X-coding acc. to IEC 61076-2-101
Number of contacts	8
Transmission category	Category 6_A, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink®	terminal module, yellow, 20 82 000 0001
Connectable cables	
– Conductor cross section	AWG 23 … AWG 22 (solid and stranded)
– Conductor diameter	1.3 … 1.6 mm
Cable termination for preLink®	terminal module, white, 20 82 000 0003
Connectable cables	
– Conductor cross section	AWG 27 … AWG 26 (solid and stranded)
– Conductor diameter	0.8 … 1.1 mm
Cable diameter	5.0 … 9.5 mm
Degree of protection	IP65/IP67
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
preLink® M12 housing	20 82 000 1210		
preLink® M12 male module Male 8 poles, X-coding	20 82 006 1218		
preLink® M12 connector set X-coding	20 82 005 0002		
preLink® RJ45 terminal module			
AWG 22/23, yellow[1]	20 82 000 0001		
AWG 26/27, white[1]	20 82 000 0003		
preLink® assembly tool	20 82 000 9901		



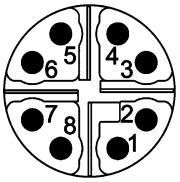


Further information and data sheets see www.HARTING.com

[1] Packaging with 10 pieces

M12 connectors X-coding

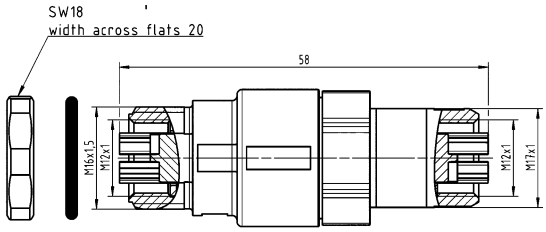
Mating face

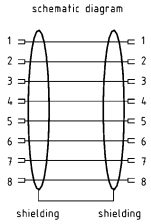


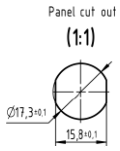
X-coding
Mating face
acc. to IEC 61076-2-109

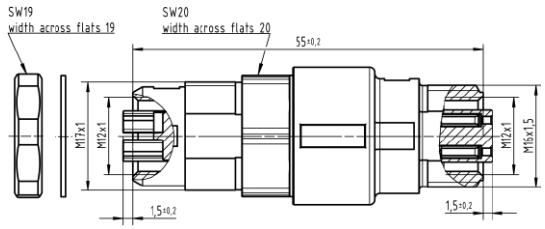
RoHS

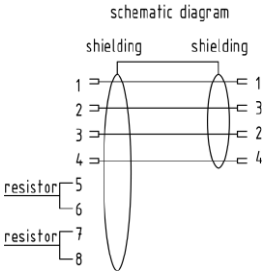
Identification	Part number	Drawing	Dimensions in mm
M12 Gender changer, Cat. 6_A	21 03 381 6815		
M12 Gender changer, Cat. 5 Female-Female 4 poles, D-coding 8 poles, X-coding	21 03 381 6402		
Wall bracket	21 01 000 0036		

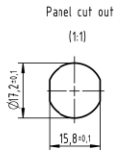


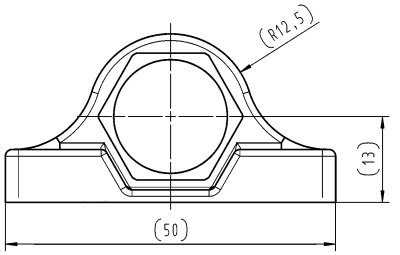


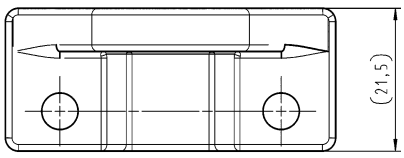




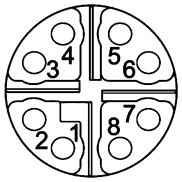








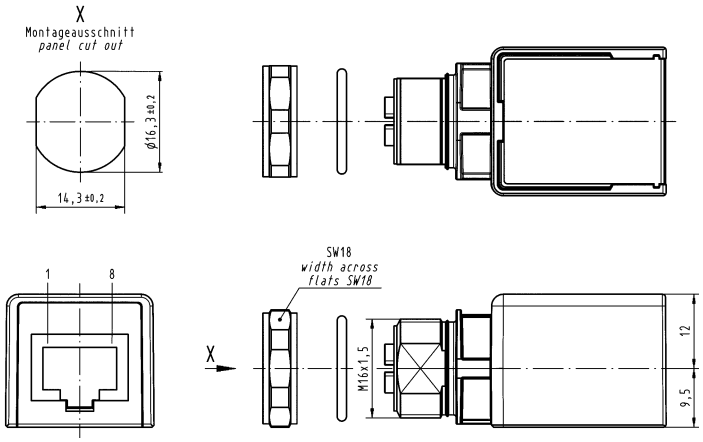
Mating face

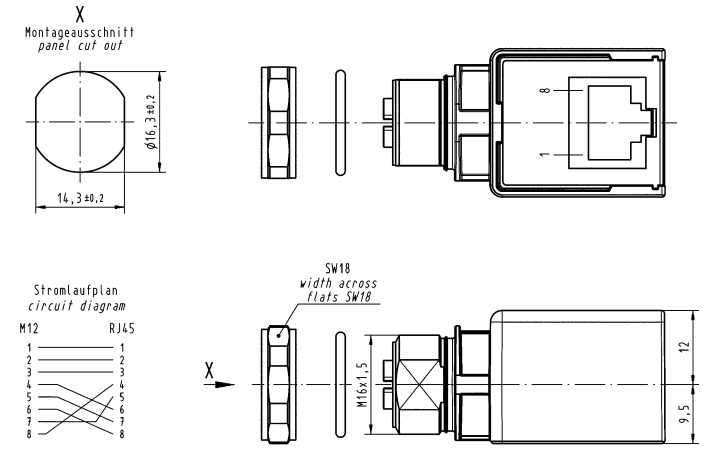


X-coding
Mating face
acc. to IEC 61076-2-109

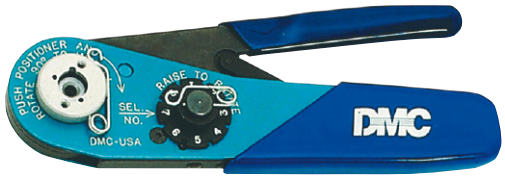
RoHS

Identification	Part number	Drawing	Dimensions in mm
har-speed M12 adapter M12-RJ45			
straight, Cat. 6_A Panel thickness min. 2.1 mm max. 4.5 mm	21 03 381 2800		
angled, Cat. 6_A Panel thickness min. 2.1 mm max. 4.5 mm	21 03 381 4800		



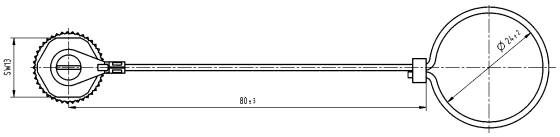
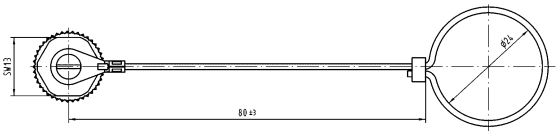
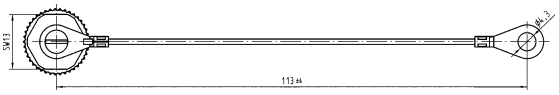
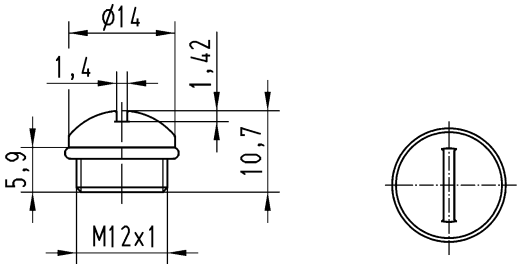


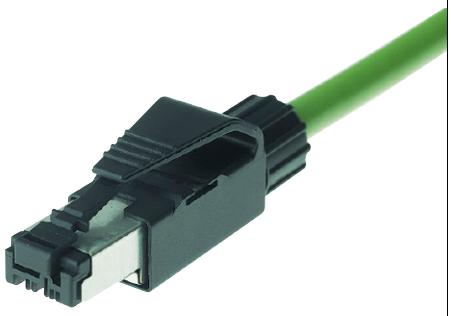
M12	RJ45
1	1
2	2
3	3
4	6
5	7
6	8
7	5
8	4

Identification	Part number	Drawing
Crimping tool for *har*-speed M12	09 99 000 0501	
Accessories *har*-speed M12		
Locator	09 99 000 0525	
Single contacts (500 mating cycles)		
har-speed M12 contacts AWG 28-24 / 0.08-0.22 mm²	21 01 100 9014	
har-speed M12 contacts AWG 26-23 / 0.13-0.25 mm²	21 01 100 9019	
Accessories M12		
Lock nut	21 01 000 0018	
M12 dynamometric screwdriver		
Tightening torque 0.6 Nm		
for M12 Slim design SW 15	09 99 000 0646	

har-speed contacts

Part number	AWG	Tool settings
21 01 100 9014	28	3
	26	4
	24	5
21 01 100 9019	26	4
	24	5
	23	5

Identification	Part number	Drawing	Dimensions in mm
Cap metal M12 for IP65 / 67 M12 metal cap for male side with cord 	21 01 000 0033		
Cap metal M12 for IP65 / 67 M12 metal cap for male side with cable clip 	21 01 000 0038		
Cap metal M12 for IP65 / 67 M12 metal cap for female side with cord 	21 01 000 0030		
Cap metal M12 for IP65 / 67 M12 metal cap for female side with cable clip 	21 01 000 0031		
Cap M12 for IP65 / 67 Seals material Viton Plastic cap for female 	21 01 000 0003		



HARTING RJ Industrial® connector set RJ45, 4 poles

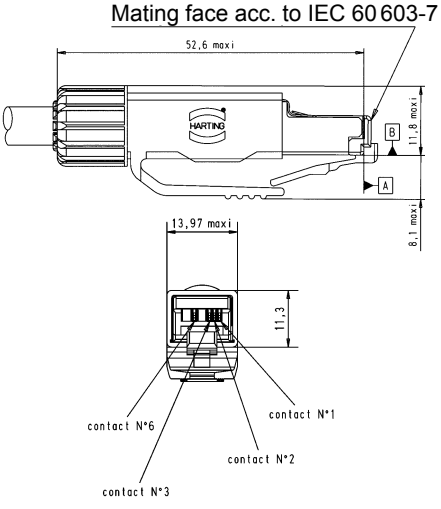
Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Compact design
- Ergonomical unlocking clip
- Less weight assures shock- and vibration-resisting connection
- Category of transmission Cat. 5
- Suitable for termination of solid and stranded cables
- Up to 10 x reconductable
- PROFINET compatible
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

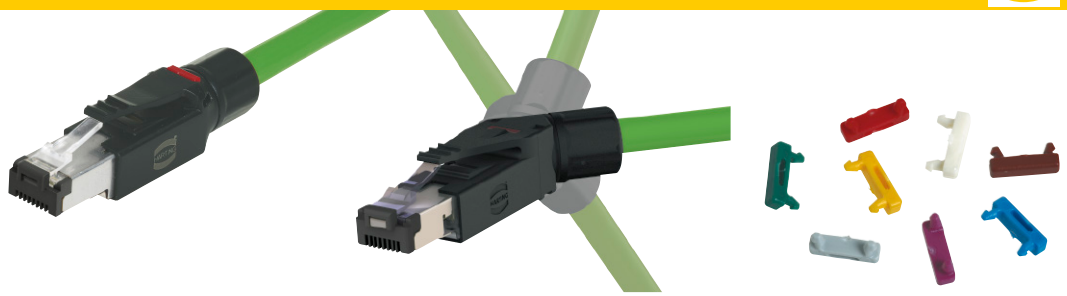
Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	4
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Mounting	field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 24/7 … AWG 22/7 (stranded) AWG 23/1 … AWG 22/1 (solid) AWG 26/7 (09 45 151 1109)
- Conductor diameter	max. 1.6 mm (09 45 151 1100 / 09 45 151 1108) max. 1.2 mm (09 45 151 1109)
- Cable diameter	6.1 … 6.9 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	Polyamide, UL 94-V0
Colour	Black
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® connector set RJ45, 4 poles		Mating face acc. to IEC 60603-7	
incl.: housing with shielding, splicing element, cable gland and instruction manual	09 45 151 1100 09 45 151 1108[1)]		
like 09 45 151 1100 but for AWG 26	09 45 151 1109		



[1)] Packaging with 100 sets

RJ45 IP20 connectors



HARTING RJ Industrial® PN connector set RJ45, 4 poles

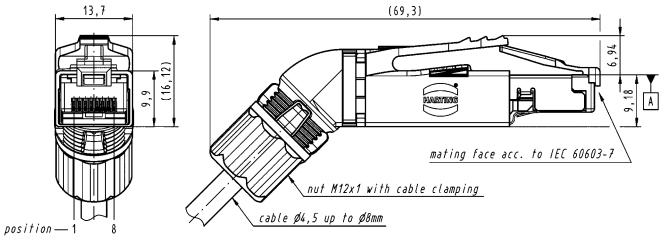
Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 5e
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

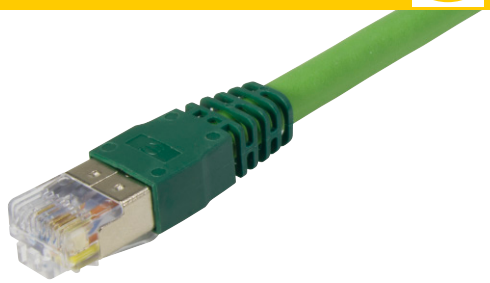
Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	4
Transmission category	Category 5e, Class D, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
Conductor cross section	AWG 27 … AWG 22 (solid / stranded)
Conductor diameter	max. 1.6 mm (incl. insulation)
Cable diameter	4.5 … 9 mm (straight version) 4.5 up to 8 mm (45° angled version)
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	Polyamide, UL 94-V0
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® PN connector set RJ45, 4 poles			
straight version	09 45 151 1120		
45° angled version (four different cable outlets possible)	09 45 151 1121		



Identification	Colour	Part number
Colour clips for colour coding the HARTING RJ Industrial® PN connector If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.	White	09 45 850 0001
	Grey	09 45 850 0002
	Yellow	09 45 850 0003
	Magenta	09 45 850 0005
	Red	09 45 850 0007
	Blue	09 45 850 0008
	Green	09 45 850 0009
	Brown	09 45 850 0010



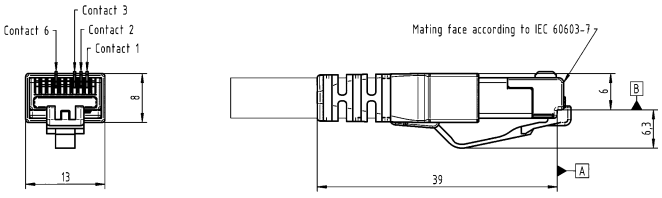
HARTING RJ Industrial® PN Compact connector set, 4 poles

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Assembly with piercing contacts
- Compact design
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 5
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

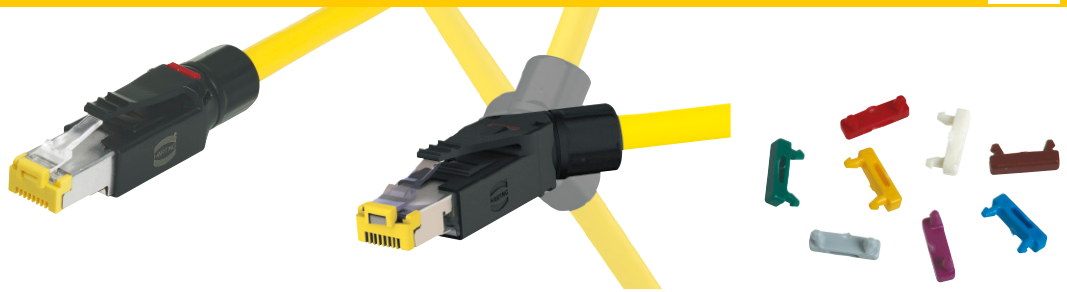
Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	4
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Assembly
Cable termination	with piercing contacts
Connectable cables	
- Conductor cross section	AWG 24/7 … AWG 22/7 (stranded)
- Conductor diameter	max. 1.6 mm (incl. insulation)
- Cable diameter	4.5 … 7.5 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	PA, UL 94-V0
Colour	Green
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® PN Compact connector set, 4 poles			
Compact version	09 45 151 1130[1)]		
Assembly tool	09 45 800 0530		

1) Packaging with 100 sets

RJ45 IP20 connectors



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

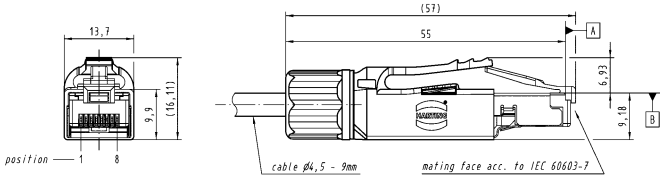
Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
Conductor cross section	AWG 27 … AWG 22 (solid / stranded)
Conductor diameter	max. 1.6 mm (incl. insulation)
Cable diameter	4.5 … 9 mm (straight version) 4.5 up to 8 mm (45° angled version)
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	- 40 °C … +70 °C
Housing material	Polyamide, UL 94-V0
Colour	Black

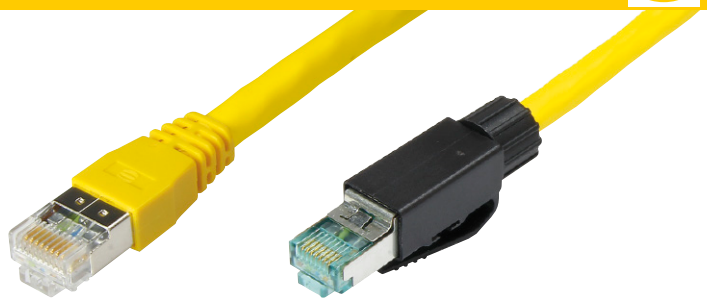
Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® 10G connector set RJ45, 8 poles			
straight version	09 45 151 1560 09 45 151 1560 XL[1)]		
45° angled version (four different cable outlets possible)	09 45 151 1561		



Identification	Colour	Part number
Colour clips for colour coding the HARTING RJ Industrial® 10G connector If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.	White	09 45 850 0001
	Grey	09 45 850 0002
	Yellow	09 45 850 0003
	Magenta	09 45 850 0005
	Red	09 45 850 0007
	Blue	09 45 850 0008
	Green	09 45 850 0009
	Brown	09 45 850 0010

[1)] Packaging with 100 sets

RJ45 IP20 connectors



HARTING RJ Industrial® Gigalink connector set RJ45, 8 poles

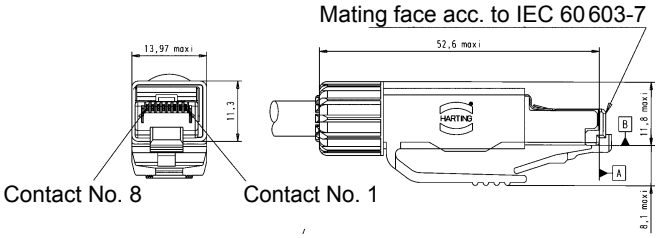
Advantages

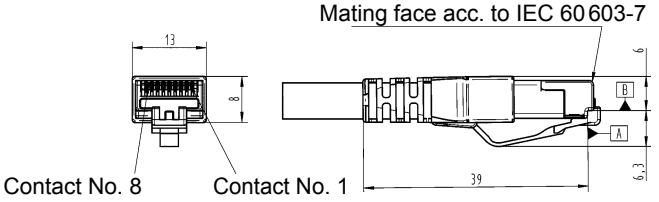
- RJ45 Ethernet-Data connector suitable for industry
- Assembly with piercing contacts
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 6_A
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Assembly
Cable termination	with piercing contacts
Connectable cables	
- Conductor cross section	AWG 28/7 … AWG 24/7 (stranded)
- Conductor diameter	max. 1.05 mm (incl. insulation)
- Cable diameter	6.1 … 6.9 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	polycarbonate, UL 94-V0
Colour	Black, yellow
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® Gigalink Cat. 6_A connector set RJ45, 8 poles			
incl.: housing with shielding, cable gland and instruction manual	09 45 151 1520 09 45 151 1520 XL[1)]		
Assembly tool for 09 45 151 1520	09 45 800 0520		
Compact version	09 45 151 1525[1)]		
Assembly tool for 09 45 151 1525	09 45 800 0025		





[1)] Packaging with 100 sets

RJ45 IP20 connectors

HARTING RJ Industrial® Gigalink connector set RJ45, 8 poles

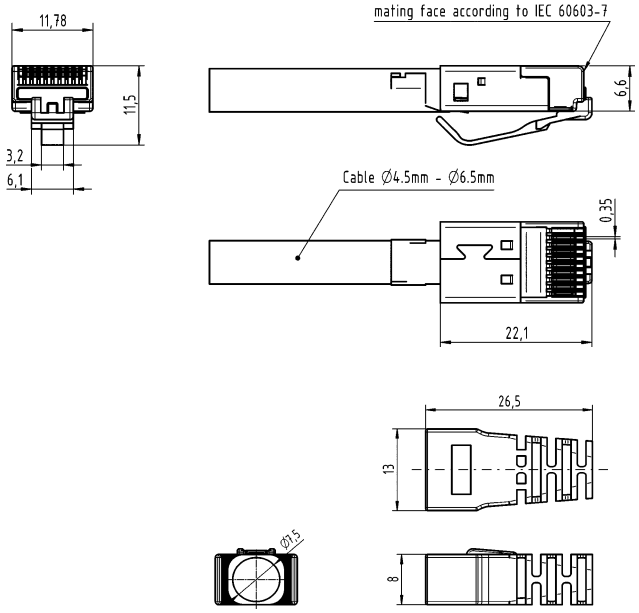
Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Assembly with piercing contacts
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 6_A
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

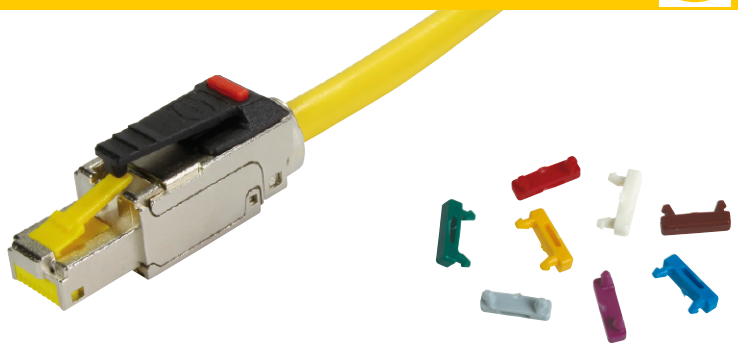
Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Assembly
Cable termination	with piercing contacts
Connectable cables	
- Conductor cross section	AWG 28/7 … AWG 24/7 (stranded)
- Conductor diameter	max. 1.05 mm (incl. insulation)
- Cable diameter	5.0 … 6.5 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	polycarbonate, UL 94-V0
Colour	Black
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® Gigalink Cat. 6_A Compact connector set RJ45, 8 poles			
without cable grommet	09 45 151 1524[1)]		
Suitable assembly tool	09 45 800 0025		
Cable grommet			
yellow	09 45 151 0010[1)]		
green	09 45 151 0021[1)]		
black	09 45 151 0022[1)]		
light grey	09 45 151 0023[1)]		
red	09 45 151 0024[1)]		
white	09 45 151 0025[1)]		
blue	09 45 151 0026[1)]		



[1)] Packaging with 100 sets



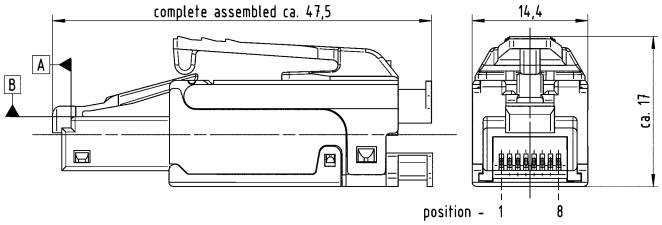
preLink® RJ45 connector

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Compact and robust design
- 360° shielding
- Ergonomically unlocking clip
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

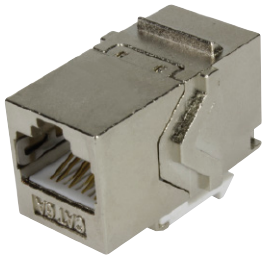
Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6_A, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink®	terminal module, yellow, 20 82 000 0001
Connectable cables	
– Conductor cross section	AWG 23 … AWG 22 (solid and stranded)
– Conductor diameter	1.3 … 1.6 mm
Cable termination for preLink®	terminal module, white, 20 82 000 0003
Connectable cables	
– Conductor cross section	AWG 27 … AWG 26 (solid and stranded)
– Conductor diameter	0.8 … 1.1 mm
Cable diameter	5 … 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	–40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
preLink® RJ45 connector	20 82 101 0010		
preLink® RJ45 terminal module			
AWG 22/23, yellow[1)]	20 82 000 0001		
AWG 26/27, white[1)]	20 82 000 0003		
preLink® assembly tool	20 82 000 9901		

Identification	Colour	Part number
Colour clips for colour coding the preLink® connectors	White	09 45 850 0001
	Grey	09 45 850 0002
	Yellow	09 45 850 0003
	Magenta	09 45 850 0005
	Red	09 45 850 0007
	Blue	09 45 850 0008
	Green	09 45 850 0009
	Brown	09 45 850 0010

[1)] Packaging with 10 pieces



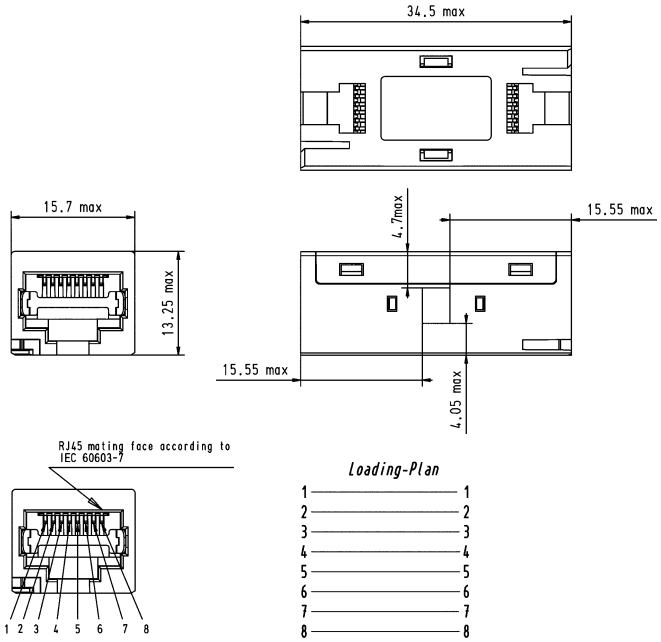
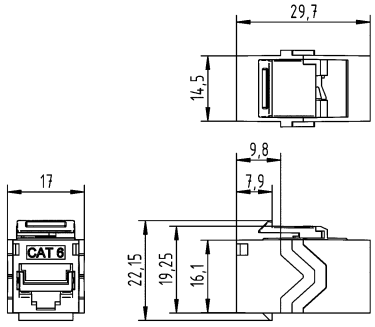
HARTING RJ Industrial® 10G RJ45 bulkhead

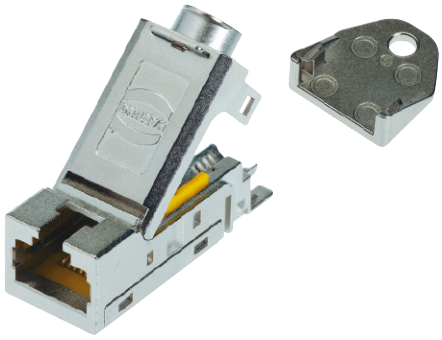
Advantages

- Compact and robust design
- 360° shielding
- Compatible with HIFF dimensions for use in:
  – Han® 3 A series
  – HARTING PushPull (V4)
  – Han® PushPull (V14)
  – *har*-port
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Mating face	RJ45 acc. to IEC 60603-7
Number of contacts	8
Transmission category	Cat. 6, performance Class E_A, suitable for 1/10 Gigabit Ethernet
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	–40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated
Flammability acc. to UL 94	V0

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® 10G RJ45 bulkhead (HIFF version)	09 45 545 1560		
HARTING RJ Industrial® 10G RJ45 bulkhead (keystone version)	09 45 545 1568		



HARTING RJ Industrial® cable jack
(HIFF version)

Advantages

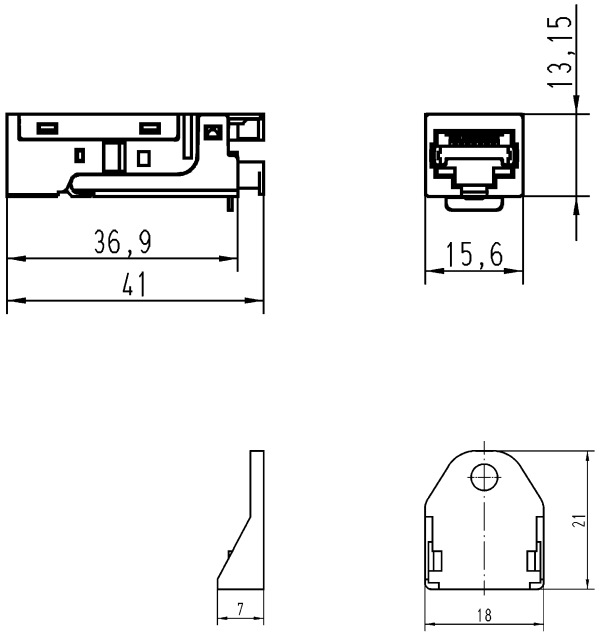
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Field-assembly with quick termination in IDC technology
- Compatible with HIFF dimensions for use in:
  - Han® 3 A series with HIFF adapter 09 45 515 0024
  - HARTING PushPull (V4)
    - Compact bulkhead mounting housing 09 45 545 0028
    - EasyInstall bulkhead mounting housing 09 45 545 0032
  - Han® PushPull (V14)
    - Panel feed-through plastic 09 35 012 0331
    - Panel feed-through metal rectangular 09 35 012 0311
    - Panel feed-through metal circular 09 35 012 0312
  - *har*-port 09 45 452 0000
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 … AWG 24 (solid/stranded)[1] AWG 24 … AWG 22 (solid/stranded)[2]
- Conductor diameter	max. 1.6 mm (incl. insulation)
- Cable diameter	5 … 9 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number
HARTING RJ Industrial® 10G cable jack, 8 poles	
AWG 28 … 24	09 45 545 1561
AWG 24 … 22	09 45 545 1562
HARTING RJ Industrial® PN cable jack, 4 poles, Cat. 5	
AWG 24 … 22	09 45 545 1120
Unlocking tool for opening of the HARTING RJ Industrial® cable jacks	20 82 000 9916

Drawing



Dimensions in mm

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

preLink® RJ45 jacks (HIFF)

Advantages

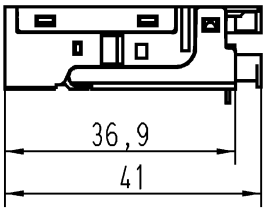
- Compact and robust design
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Compatible with HIFF dimensions for use in:
  - Han® 3 A series with HIFF adapter 09 45 515 0024
  - HARTING PushPull (V4)
    Compact bulkhead mounting housing 09 45 545 0028
    EasyInstall bulkhead mounting housing 09 45 545 0032
  - Han® PushPull (V14)
    Panel feed-through plastic 09 35 012 0331
    Panel feed-through metal rectangular 09 35 012 0311
    Panel feed-through metal circular 09 35 012 0312
  - *har*-port 09 45 452 0000
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

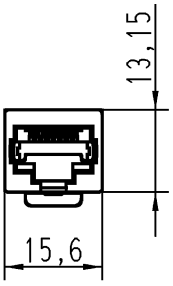
Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6_A, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® yellow, 20 82 000 0001	terminal module,
Connectable cables	
– Conductor cross section	AWG 23 … AWG 22 (solid and stranded)
– Conductor diameter	1.3 … 1.6 mm
Cable termination for preLink® white, 20 82 000 0003	terminal module,
Connectable cables	
– Conductor cross section	AWG 27 … AWG 26 (solid and stranded)
– Conductor diameter	0.8 … 1.1 mm
Cable diameter	5 … 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	–40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number
preLink® set RJ45 jack	
consists of: • 1x RJ45 module • 1x terminal module • 1x cable tie	
AWG 22/23	20 82 001 0001
AWG 26/27	20 82 001 0002
preLink® RJ45 jack module	20 82 000 0002
preLink® RJ45 terminal module	
AWG 22/23, yellow[1)]	20 82 000 0001
AWG 26/27, white[1)]	20 82 000 0003
preLink® protection cover	20 82 000 9915
preLink® unlocking tool	20 82 000 9916
preLink® assembly tool	20 82 000 9901

Drawing



Dimensions in mm



[1)] Packaging with 10 pieces

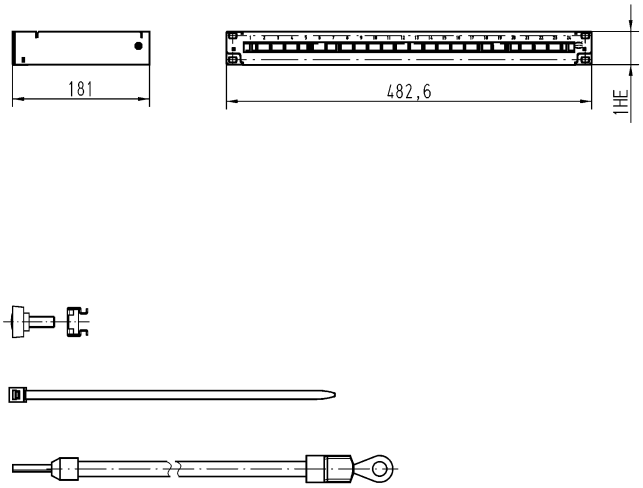
preLink®
19” patch panel, HIFF

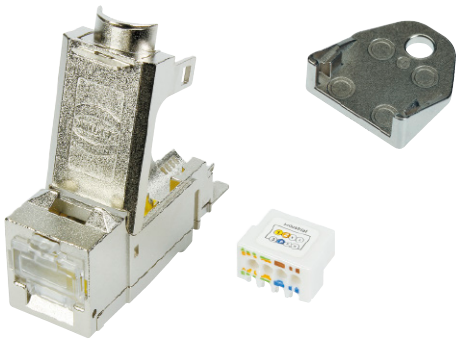
Advantages

- Flexible, suitable for preLink® modules RJ45 jack and HARTING RJ Industrial® modules in HIFF size
- Economical, time-saving installation due to the slidable module carrier, frontward and backward removal
- Safety, additional strain-relief
- Fully shielded modules connected by module carrier
- Earth bolt
- IP20 installation for distributors and switch cabinets

Technical characteristics

Number of modules	24
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Assembly	in 19” racks acc. to IEC/DIN EN 60 297-3-100 (DIN 41 494-1)
Dimensions (W x H x D)	482.6 mm (19”) x 44.5 mm (1 U) x 181 mm
Degree of protection	IP20
Operating temperature range	-40 °C … +70 °C
Material	
module carrier, 2-parts	steel sheet
front cover	stainless steel

Identification	Part number	Drawing	Dimensions in mm
preLink® 19” patch panel, unloaded Suitable modules: • preLink® RJ45 jack, HIFF • mixed loading possible Range of delivery:: • Screw set M5 • 24 cable ties • 1x earth conductor 6 mm²	20 82 400 0001		



HARTING RJ Industrial® cable jack (keystone version)

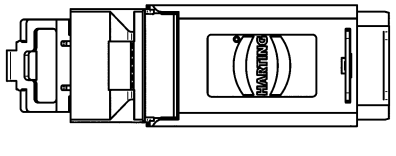
Advantages

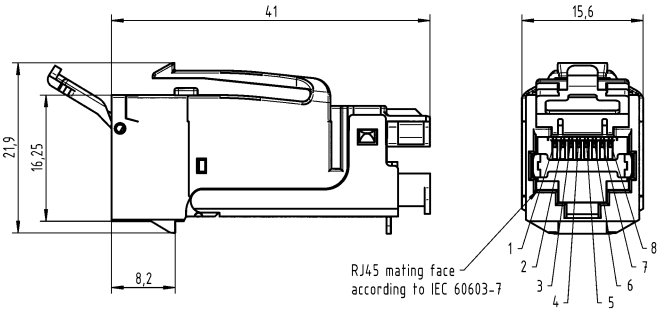
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Field-assembly with quick termination in IDC technology
- Keystone form factor – useable for DIN-rail outlet 09 45 851 0000 and a wide range of typical patch panels and wall outlets
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6_A, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 … AWG 24 (solid/stranded)[1)] AWG 24 … AWG 22 (solid/stranded)[2)]
- Conductor diameter	max. 1.6 mm (incl. insulation)[1)] max. 1.2 mm (incl. insulation)[2)]
- Cable diameter	5 … 9 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

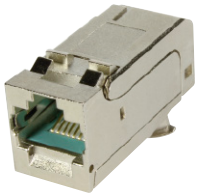
Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® 10G cable jack, 8 poles			
AWG 28 … 24	09 45 545 1563		
AWG 24 … 22	09 45 545 1564		
HARTING RJ Industrial® PN cable jack, 4 poles, Cat. 5			
AWG 24 … 22	09 45 545 1122		
Unlocking tool for opening of the HARTING RJ Industrial® cable jacks	20 82 000 9916		





[1)] For part number 09 45 545 1564
[2)] For part number 09 45 545 1563 and 09 45 545 1122

PROFI INDUSTRIAL ETHERNET NET



preLink® RJ45 jack
(keystone version)

Advantages

- RJ45 Ethernet-Data jack suitable for industry
- Compact and robust design
- 360° shielding
- Ergonomically unlocking clip
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Compatible with keystone panel cut out acc. to IEC 60603-7
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

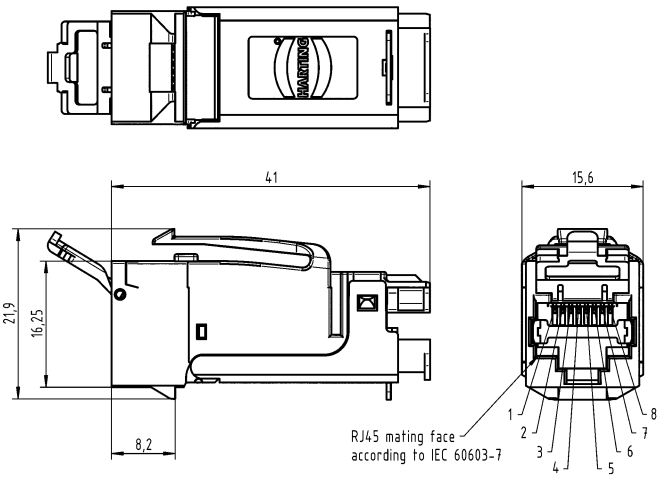
Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6_A, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® terminal module, yellow, 20 82 000 0001	
Connectable cables	
– Conductor cross section	AWG 23 … AWG 22 (solid and stranded)
– Conductor diameter	1.3 … 1.6 mm
Cable termination for preLink® terminal module, white, 20 82 000 0003	
Connectable cables	
– Conductor cross section	AWG 27 … AWG 26 (solid and stranded)
– Conductor diameter	0.8 … 1.1 mm
Cable diameter	5 … 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	–40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification		Part number
preLink® set RJ45 keystone jack consists of: • 1x RJ45 module • 1x terminal module • 1x cable tie	AWG 22/23	20 82 501 0001
preLink® RJ45 keystone jack module		20 82 500 0001
preLink® RJ45 angled keystone jack module		20 82 500 0002[2]
preLink® RJ45 terminal module		
	AWG 22/23, yellow[1]	20 82 000 0001
	AWG 26/27, white[1]	20 82 000 0003
preLink® protection cover		20 82 000 9915
preLink® unlocking tool		20 82 000 9916
preLink® assembly tool		20 82 000 9901

Drawing

Dimensions in mm



[1] Packaging with 10 pieces
[2] Packaging with 24 pieces

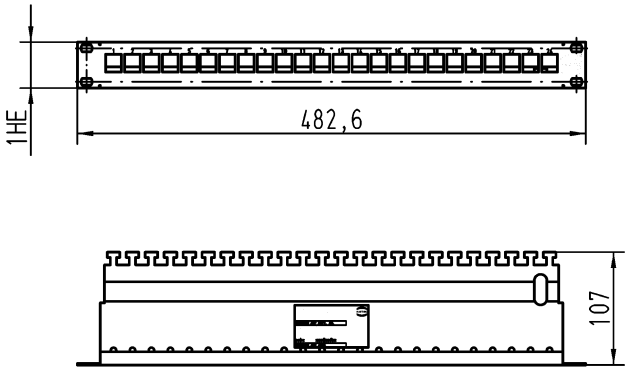
preLink®
19” patch panel, Keystone

Advantages

- Suitable for preLink® RJ45 module in Keystone size
  - Economic due to easy design
  - Safety, additional strain-relief
  - Fully shielded modules connected through metal holding fixture
  - Earth bolt

Technical characteristics

Number of modules	24
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Module design	Keystone size acc. to EN 60 603-7:2009
Assembly	in 19” racks acc. to IEC/DIN EN 60 297-3-100 (DIN 41 494-1)
Dimensions (W x H x D)	482.6 mm (19”) x 44.5 mm (1 U) x 107 mm
Degree of protection	IP20
Operating temperature range	-40 °C … +70 °C
Material	steel sheet

Identification	Part number	Drawing	Dimensions in mm
preLink® 19” patch panel, Keystone Range of delivery:: 24 pieces of: • preLink® RJ45 Keystone jack • terminal modules for AWG 22 / 23 • strain relief	20 82 405 0001		
preLink® 19” patch panel, Keystone empty	20 82 400 0002		

HARTING Cabinet Outlet RJ45, 8 poles

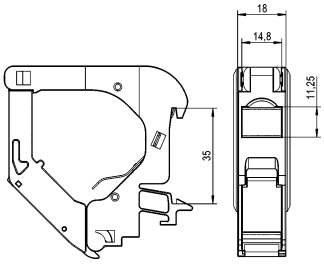
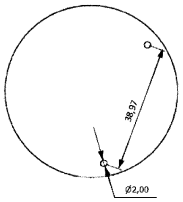
RJ45 distribution module for IP20 environments
(top-hat rail mounting)

Advantages

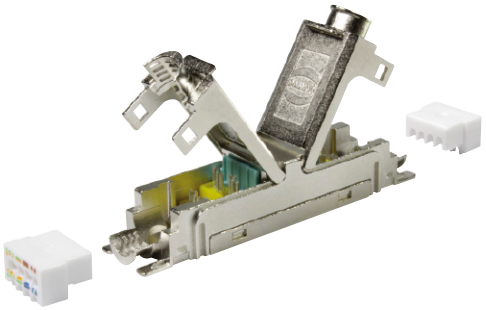
- Simple mountng
- Dust protection caps
- Port identification
- Angled output

Technical characteristics

Number of ports, Copper / Termination	1 / RJ45 (Twisted Pair)
Transmission performance	Category 6_A / Class E_A up to 250 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Mounting	To 35 mm top-hat mounting rail acc. to DIN EN 60 715, alignable
Dimensions (H x W x D)	71 x 18 x 68 mm
Degree of protection	IP20
Operating temperature range	-20 °C … +70 °C
Housing material	Polyamide, UL94 V-0
Colour	Grey

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® Cabinet Outlet RJ45	09 45 851 0000		
Protection cover set for 09 45 851 0000	09 45 851 0001		
Usable RJ45 cable jacks			
• preLink® keystone set AWG 22/23 (with preLink® terminal block)	20 82 501 0001		
• preLink® keystone set (without preLink® terminal block)	20 82 500 0001		
Usable with preLink® terminal blocks			
• preLink® terminal block AWG 22/23 (24)	20 82 000 0001		
• preLink® terminal block AWG 26/27	20 82 500 0003		
Usable RJ45 cable jacks			
• RJ45 keystone module IDC AWG 24 – AWG 22	09 45 545 1564		
• RJ45 keystone module IDC AWG 27 – AWG 26	09 45 545 1563		

HARTING RJ Industrial® 10G Extender



Advantages

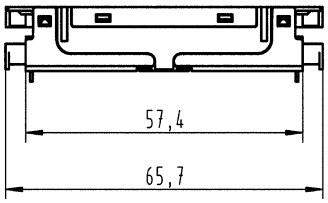
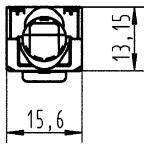
- Simple, fast and reliable connection of data cables
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Field assembly without special tools

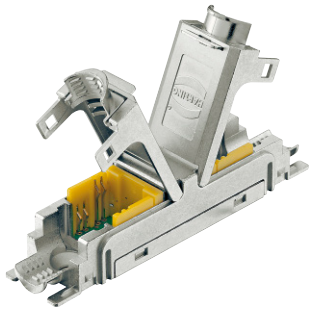
Application

- Extension of cables for data communication
- Connection of cables with different cross-sections
- Linking of fire compartments

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6_A, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Connectable cables	
– Conductor cross section	AWG 23 … AWG 22 (solid and stranded)
– Conductor diameter	1.3 … 1.6 mm
Cable diameter	5 … 9 mm
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® 10G Extender	09 45 545 1569		



preLink® Extender

Advantages

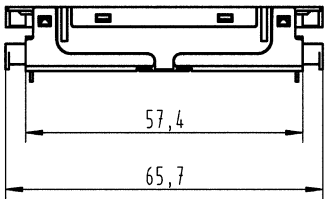
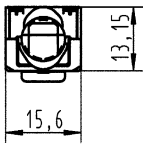
- Simple, fast and reliable connection of data cables
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires

Application

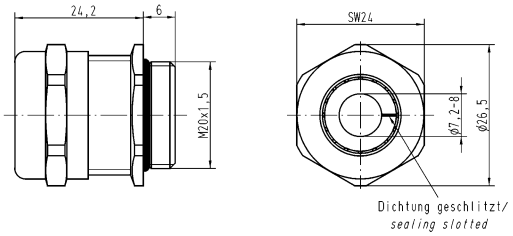
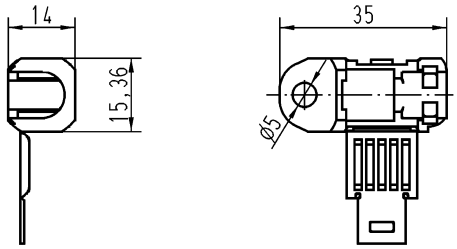
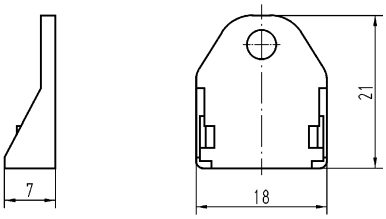
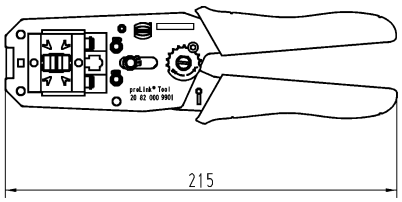
- Extension of cables for data communication
- Connection of cables with different cross-sections
- Linking of fire compartments

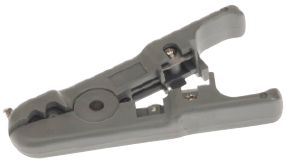
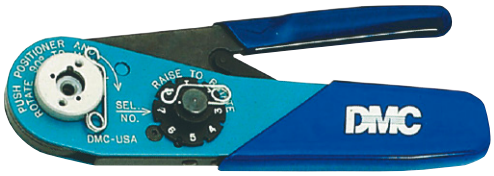
Technical characteristics

Connector type	RJ45 connector acc. to IEC 60603-7
Number of contacts	8
Transmission category	Category 6_A, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® terminal module, yellow, 20 82 000 0001	
Connectable cables	
– Conductor cross section	AWG 23 … AWG 22 (solid and stranded)
– Conductor diameter	1.3 … 1.6 mm
Cable termination for preLink® terminal module, white, 20 82 000 0003	
Connectable cables	
– Conductor cross section	AWG 27 … AWG 26 (solid and stranded)
– Conductor diameter	0.8 … 1.1 mm
Cable diameter	5 … 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	–40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
preLink® Extender	20 82 101 0001		
preLink® RJ45 terminal module			
AWG 22/23, yellow[1)]	20 82 000 0001		
AWG 26/27, white[1)]	20 82 000 0003		
preLink® assembly tool	20 82 000 9901		

[1)] Packaging with 10 pieces

Identification	Part number	Drawing	Dimensions in mm
Cable gland M20x1.5 for pre-terminated Ha-VIS preLink® cable assemblies with slotted seal Cable-sheath 7.2 mm … 8.0 mm Cable-sheath 4.0 mm … 6.5 mm 	 19 00 000 5020 19 00 000 5079		
Protection cover for pre-terminated Ha-VIS preLink® cable assemblies Set of 10 pieces 	20 82 000 9915		
Unlocking tool for Ha-VIS preLink® RJ45 module Set of 5 pieces 	20 82 000 9916		
HARTING Assembly tool for preLink® terminal module 	20 82 000 9901		

Identification	Part number	
HARTING RJ Industrial® Stripping Tool Stripping tool for Ethernet cables including blade cassette Spare blade cassette	09 45 800 0000 09 45 800 0001	 The RJ Industrial Stripping Tool is ready to remove insulation from Ethernet cables for fast mounting with diameters from 2.5 to 8 mm quick and easy. It allows to remove cable sheath and shielding braid in one.
Stripping tool	09 45 800 0002	
HARTING RJ Industrial® LSA-Punch Down Tool	09 45 800 0020	 The LSA-Punch Down Tool is used to wire RJ45 Industrial Metal Outlets (part number 09 45 815 1100). The various conductors are cut to length and inserted into the insulation displacement contacts in a single pass.
HARTING M12 dynamometric screwdriver SW 18 or 13	09 99 000 0382	
Crimping tool for M12 Crimp	09 99 000 0501	
Cable shear	09 45 800 0004	
Wire cutter	09 45 800 0005	
HARTING RJ Industrial® Gigalink assembly tool	09 45 800 0520	

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

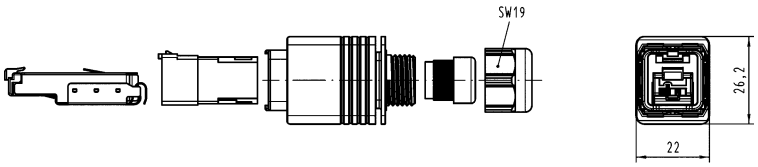
Advantages

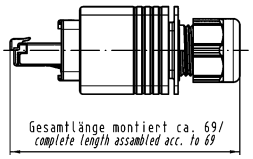
- HARTING PushPull technology
- Field-assembly connector with IDC contacts
- Fully shielded

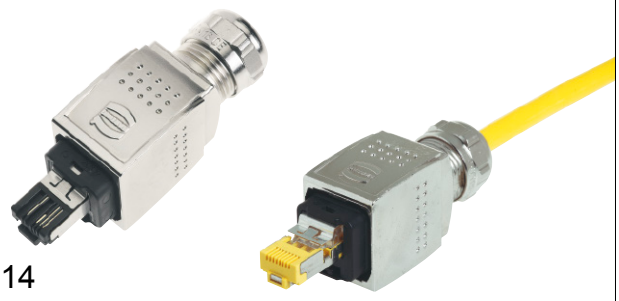
Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117	
Degree of protection	IP65 / IP67	
Mating face	RJ45 acc. to IEC 60 603-7	
Shielding	Fully shielded, 360° shielding contact	
Number of contacts	4 respectively 8	
Transmission performance	acc. to ISO / IEC 11 801:2002, EN 50 173-1, Category 5 / Class D up to 100 MHz, Category 6 / Class E_A up to 500 MHz	
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s	
Termination	with IDC contacts, no tools needed / field-assembly	
for Cat. 5	Conductor cross section	AWG 24/7 - 22/7 (stranded) AWG 23/1 - 22/1 (solid)
	Cable diameter	1.6 mm
for Cat. 6	Conductor cross section	AWG 22/7 - 27/7 (stranded) AWG 22/1 - 27/1 (solid)
	Cable diameter	1.6 mm
Mating cycles	min. 750	
Temperature range	-40 °C … +70 °C	
Housing material	Plastic, black, UL 94 V0	

Identification	Part number	Drawing	Dimensions in mm
Connector set, plastic incl. housing and male insert			
Han® RJ Industrial Category 5, 4 poles, IDC contacts			
6.5 - 9.5 mm clamp range	09 35 221 0421		
5 - 8 mm clamp range	09 35 222 0421		
Han® RJ Industrial PN Category 5, 4 poles, IDC contacts			
6.5 - 9.5 mm clamp range	09 35 226 0421		
PROFINET-Identification: PROFINET O-Plug RJ45			
Han® RJ Industrial 10G Category 6, 8 poles, IDC contacts			
6.5 - 9.5 mm clamp range	09 35 225 0421		
5 - 8 mm clamp range	09 35 228 0421		







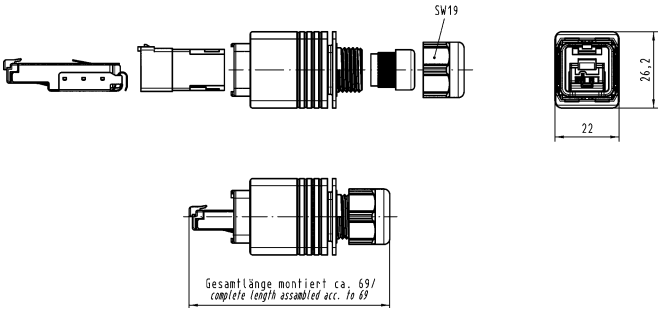
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 connector

Advantages

- HARTING PushPull technology
- Field-assembly connector with IDC contacts
- Fully shielded

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60 603-7
Shielding	Fully shielded, 360° shielding contact
Number of contacts	4 respectively 8
Transmission performance	acc. to ISO / IEC 11 801:2002, EN 50 173-1, Category 5 / Class D up to 100 MHz Category 6 / Class E_A up to 500 MHz
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Termination	with IDC contacts, no tools needed / field-assembly
for Cat. 5	
Conductor cross section	AWG 24/7 - 22/7 (stranded) AWG 23/1 - 22/1 (solid)
Cable diameter	1.6 mm
for Cat. 6	
Conductor cross section	AWG 22/7 - 27/7 (stranded) AWG 22/1 - 27/1 (solid)
Cable diameter	1.6 mm
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
Connector set, metal incl. housing and male insert 4 - 11 mm clamp range			
Han® RJ Industrial Category 5, 4 poles, IDC contacts	09 35 221 0401		
Han® RJ Industrial PN Category 5, 4 poles, IDC contacts PROFINET-Identification: PROFINET O-Plug RJ45	09 35 226 0401		
Han® RJ Industrial 10G Category 6, 8 poles, IDC contacts	09 35 225 0401		

PushPull RJ45 IP65 / IP67 connectors

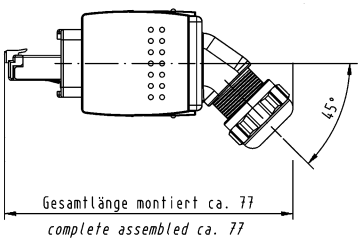
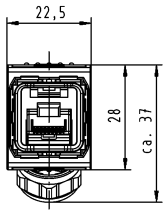
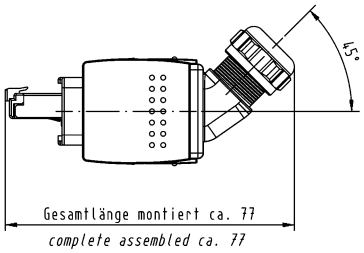
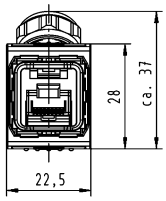
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 connector angled

Advantages

- HARTING PushPull technology
- Angled cable exit 45° to the top / bottom for a space saving cabling
- Field-assembly connector with IDC contacts
- Fully shielded

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60 603-7
Shielding	Fully shielded, 360° shielding contact
Number of contacts	4 respectively 8
Transmission performance	acc. to ISO / IEC 11 801:2002, EN 50 173-1, Category 5 / Class D up to 100 MHz Category 6 / Class E_A up to 500 MHz
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Termination	with IDC contacts, no tools needed / field-assembly
for Cat. 5	
Conductor cross section	AWG 24/7 - 22/7 (stranded) AWG 23/1 - 22/1 (solid)
Cable diameter	1.6 mm
for Cat. 6	
Conductor cross section	AWG 22/7 - 27/7 (stranded) AWG 22/1 - 27/1 (solid)
Cable diameter	1.6 mm
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
Connector set, metal incl. housing and male insert			
Han® RJ Industrial PN Category 5, 4 poles, IDC contacts, 6.5 - 9.5 mm clamp range			
Cable exit bottom side	09 35 226 0402		
Cable exit top side	09 35 226 0403		
Han® RJ Industrial 10G Category 6, 8 poles, IDC contacts, 6.5 - 9.5 mm clamp range			
Cable exit bottom side	09 35 225 0402		
Cable exit top side	09 35 225 0403		

PushPull RJ45 IP65 / IP67 connectors

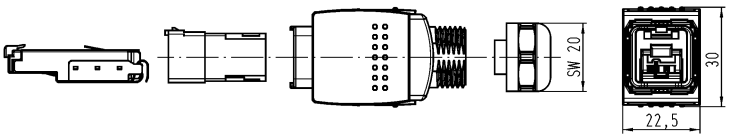
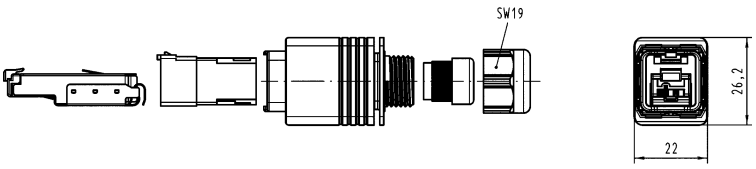
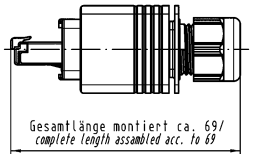
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 connector

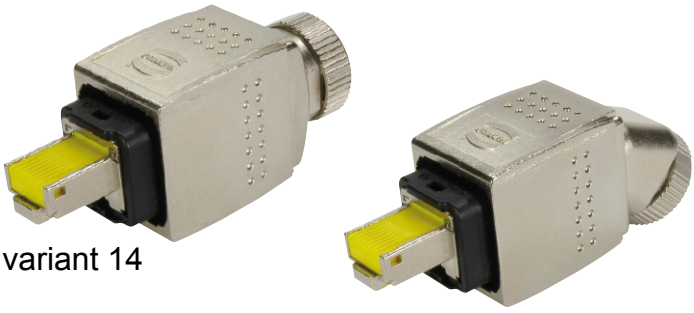
Advantages

- HARTING PushPull technology
- Compact design
- For space saving fitting conditions
- Connector with piercing contacts
- 360° shielding

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60 603-7
Shielding	Fully shielded, 360° shielding contact
Number of contacts	8
Transmission performance	acc. to ISO / IEC 11 801:2002, EN 50 173-1, Category 6_A / Class E_A up to 500 MHz
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Termination	with piercing contacts
Conductor cross section	AWG 24/7 - 27/7 (stranded)
Cable diameter	1.05 mm
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated Plastic, black, UL 94 V0

Identification	Part number	Drawing	Dimensions in mm
Connector set, metal incl. housing and male insert 4 - 11 mm clamp range			
Han® RJ Industrial Category 6, 8 poles, piercing contacts	09 35 227 0401		
Connector set, plastic incl. housing and male insert 5 - 8 mm clamp range			
Han® RJ Industrial Category 6_A, 8 poles, piercing contacts	09 35 227 0421		
suitable assembly tool	09 45 800 0520		



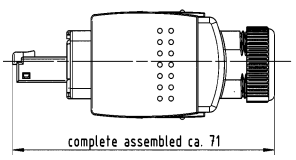
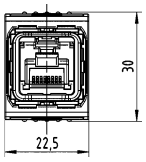
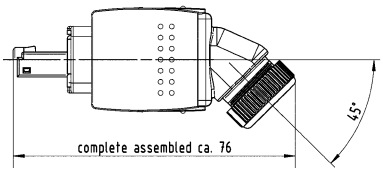
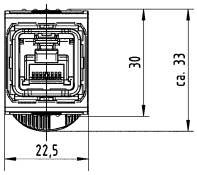
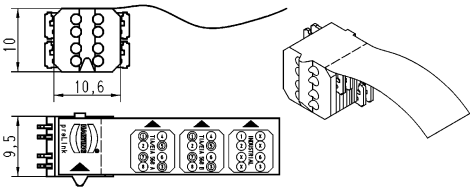
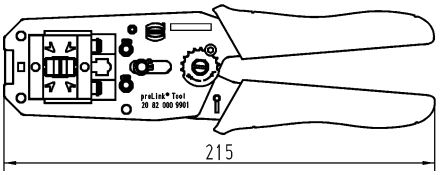
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
preLink® RJ45 connector, straight and angled

Advantages

- HARTING PushPull technology
- 45° angled cable entry, bottom side, for space saving cabling
- 360° shielding
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60 603-7
Number of contacts	8
Transmission category	Category 6_A, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink®	terminal module, yellow, 20 82 000 0001
Connectable cables	
– Conductor cross section	AWG 23 … AWG 22 (solid and stranded)
– Conductor diameter	1.3 … 1.6 mm
Cable termination for preLink®	terminal module, white, 20 82 000 0003
Connectable cables	
– Conductor cross section	AWG 27 … AWG 26 (solid and stranded)
– Conductor diameter	0.8 … 1.1 mm
Cable diameter	6.3 … 8.8 mm
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
Han® PushPull preLink® RJ45 connector, straight	20 82 104 0001		
Han® PushPull preLink® RJ45 connector, angled	20 82 104 0045		
Han® PushPull preLink® RJ45 connector plastic, straight	20 82 204 0001		
preLink® RJ45 terminal module			
AWG 22/23, yellow[1)]	20 82 000 0001		
AWG 26/27, white[1)]	20 82 000 0003		
preLink® assembly tool	20 82 000 9901		

[1)] Packaging with 10 pieces

PushPull RJ45 IP65 / IP67 connectors

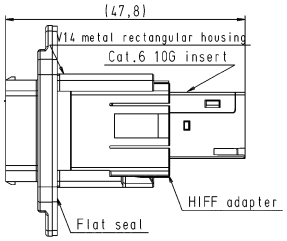
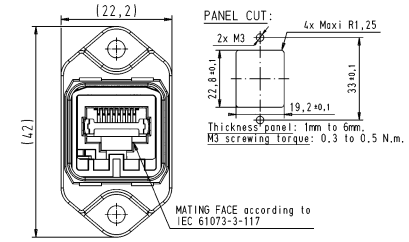
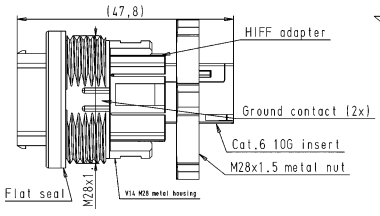
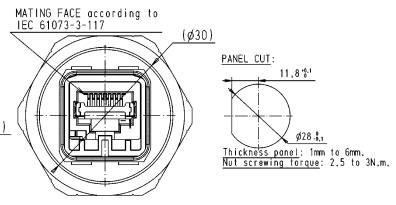
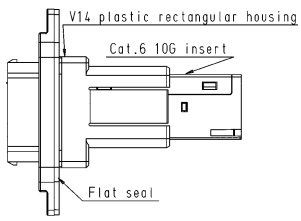
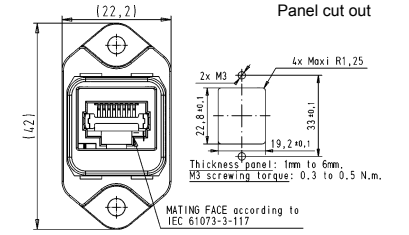
Han® PushPull, type acc. to IEC 61 076-3-117 variant 14
RJ45 10G panel feed through

Advantages

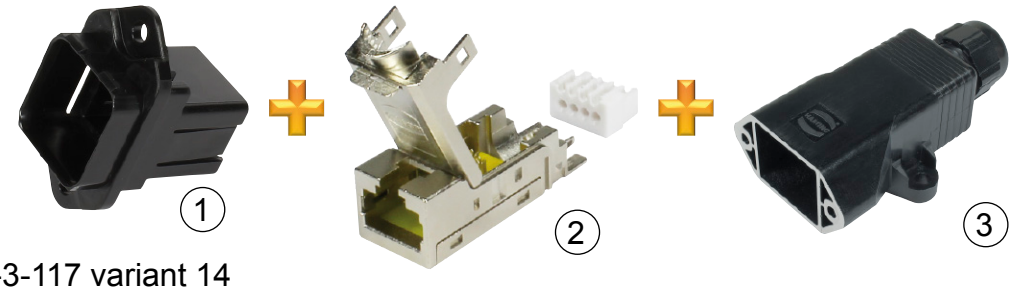
- HARTING PushPull technology
- Compact design
- High packing density
- Device integration via RJ45 PCB connectors

Technical characteristics

Locking	PushPull technology acc. to IEC 61 076-3-117
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60 603-7
Transmission performance	acc. to ISO / IEC 11 801:2002, EN 50 173-1, Category 5 / Class D up to 100 MHz resp. Category 6 / Class E_A up to 500 MHz
Transmission rate	10 / 100 Mbit/s and 1 / 10 Gbit/s
Number of contacts	8
Shielding	Fully shielded, 360° shielding contact (Cat. 6)
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C
Housing material	Plastic, black Zinc die-cast, nickel-plated
Flammability acc. to UL 94	V0

Identification	Part number	Drawing	Dimensions in mm
Han® PushPull RJ45 10G			
Panel feed through, Cat. 6 including bulkhead housing for rectangular panel cut out, flat seal and HARTING RJ Industrial® 10G RJ45 bulkhead, isolated bulkhead fixture	09 35 225 0311		
Panel feed through, Cat. 6 including bulkhead housing for circular panel cut out, flat seal and HARTING RJ Industrial® 10G RJ45 bulkhead, isolated bulkhead fixture	09 35 225 0312		
Han® PushPull RJ45			
Panel feed through Cat. 6 including housing and HARTING RJ Industrial® 10G RJ45 bulkhead	09 35 225 0331		

PushPull RJ45 IP65 / IP67 connectors



Han® PushPull,
type acc. to IEC 61 076-3-117 variant 14
Housing bulkhead mounting and housing cable-to-cable combinations

Advantages

• Type / Material	RJ45 / plastic or metal
• Category	5 / 6_A
• Number of wires	4 / 8
• Termination	IDC
• Cable diameter	5 - 9 mm

Application

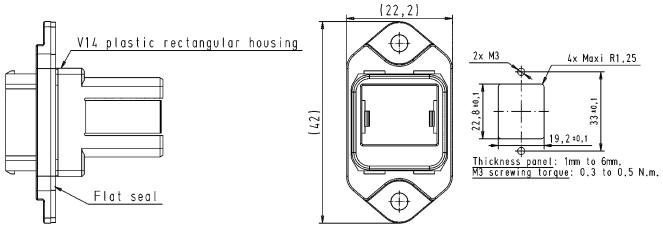
- Industrial cabling
- On machines and control units

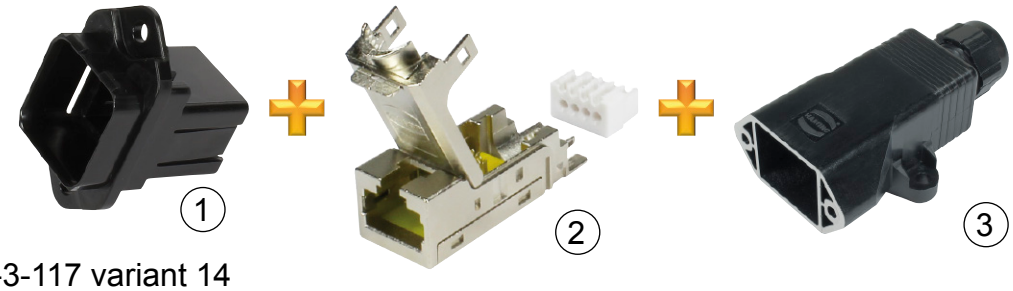
Benefits

- HARTING PushPull technology
- Compact design
- High packing density
- Device integration via RJ45 PCB connectors

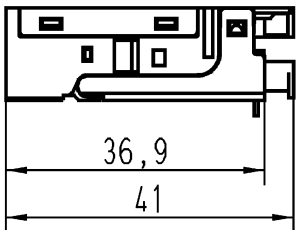
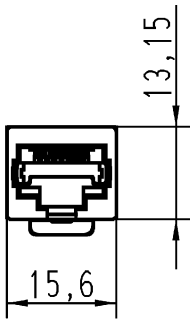
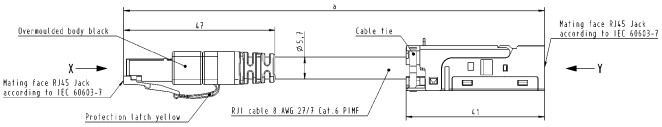
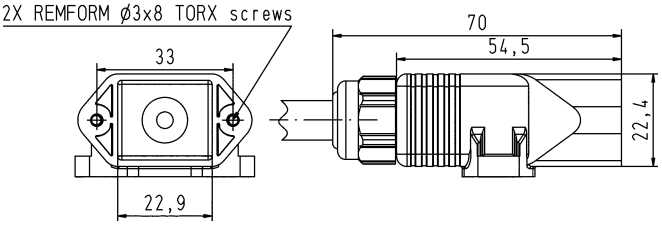
Technical characteristics

Connector type	PushPull technology acc. to IEC 61 076-3-117 variant 14
Number of contacts	4 or 8 depending on type
Transmission performance	Category 5 / 6_A depending on type
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Cable termination	tool-less with IDC contacts or preLink® IDC
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material	plastic / metal

Identification		Part number	Drawing	Panel cut out Dimensions in mm
Han® PushPull V14 Housing bulkhead mounting	1			
panel feed-through plastic, black		09 35 012 0331		
panel feed-through metal for angular panel cut out, incl. plastic mounted adapter		09 35 012 0311		
panel feed-through metal for round panel cut out, incl. plastic mounted adapter and fixing nut (Not combinable with 3 !)		09 35 012 0312		



Han® PushPull,
type acc. to IEC 61076-3-117 variant 14
Housing bulkhead mounting and housing cable-to-cable combinations

Identification	Part number	Drawing	Dimensions in mm
RJ45 female inserts ②			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1120		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 28-24 solid and stranded	09 45 545 1561		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1562		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 solid and stranded	20 82 001 0001		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 27/26 solid and stranded	20 82 001 0002		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001 / 20 82 000 0003)	20 82 000 0002		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s RJ45 system cable jack on connector 0.15 m	09 45 545 1500 up to		
10.0 m	09 45 545 1518		
Han® PushPull Housing cable-to-cable ③			
plastic, black (not in combination with Housing bulkhead mounting 09 35 012 0312!)			
for cable outer diameter 6.5 … 9.5 mm	09 35 002 0431		
for cable outer diameter 9 … 13 mm	09 35 002 0433		

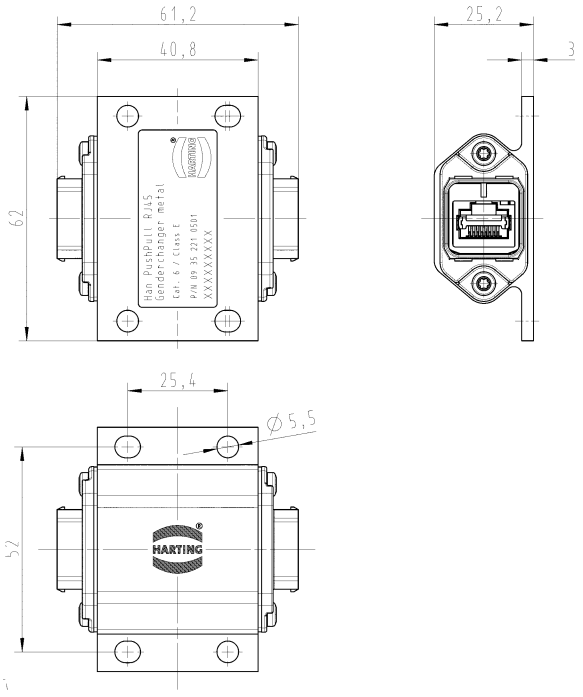
Han® PushPull RJ45 Gender changer Metal
Cat. 6 / Class E_A

Advantages

- High degree of protection IP65 / IP67
- Robust metal housing
- Standard PROFINET component of the German automotive production
- Allows usage of different cable types (Type B, C) e.g. in robots application
- Extension of cords according to PROFINET guideline
- Can be count as one connection acc. to IEC 11 801 Chapter 10.2.4

Technical characteristics

Transmission performance	Cat. 6 / Class E_A up to 500 MHz
Connector	Han® PushPull RJ45 (PROFINET conform)
Locking	PushPull technology acc. to IEC 61 076-3-117 variant 14
Mating face	RJ45 acc. to IEC 60 603-7
Mating cycles	min. 750
Housing material	Aluminium anodized
Dimensions	61.2 x 62 x 25.2 mm (unmated)
Degree of protection acc. to DIN 60 529	IP65 / IP67 (mated)
Mounting	Wall mountable with 4 screws (type M5)
Temperature range	-40 °C … +70 °C
Maximum permissible humidity	30 % … 95 % (no condensation)

Identification	Part number	Drawing	Dimensions in mm
Han® PushPull RJ45 Gender changer metal	09 35 221 0501		

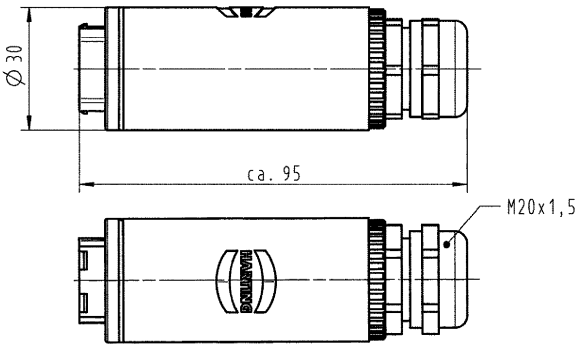
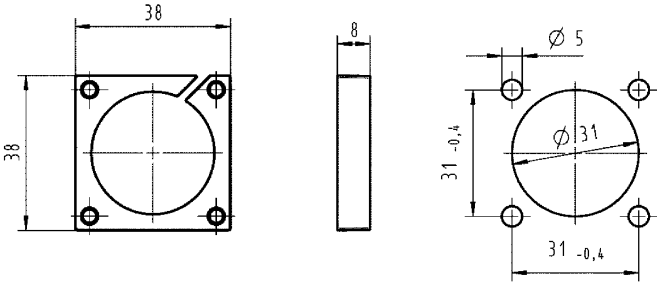
Han® PushPull RJ45 Coupling Metal
Cat. 6 / Class E_A

Advantages

- High degree of protection IP65 / IP67
- Robust metal housing
- Standard PROFINET component of the German automotive production
- Extension of cords according to PROFINET guideline
- Can be count as one connection acc. to IEC 11 801 Chapter 10.2.4
- For an easy robot termination and a fast exchange of tube packages

Technical characteristics

Transmission performance	Cat. 6 / Class E_A up to 500 MHz
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Locking	PushPull technology acc. to IEC 61 076-3-117 variant 14
Mating face	RJ45 acc. to IEC 60 603-7
Number of contacts	8
Usable cables	
Termination cross section	AWG 22-24 stranded/solid
Cable diameter	5 … 9 mm
Conductor diameter	1.3 … 1.6 mm
Mating cycles	min. 750
Housing material	Aluminium die-cast
Degree of protection acc. to DIN 60 529	IP65 / IP67
Temperature range	-40 °C … +70 °C

Identification	Part number	Drawing	Dimensions in mm
Han® PushPull RJ45 Coupling metal including housing, preLink® RJ45 jack, bulkhead housing and cable gland	61 04 201 1084		
Fixing flange	61 04 600 0182		

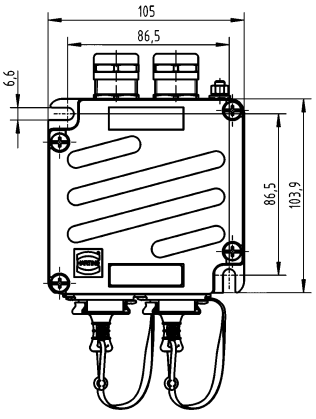
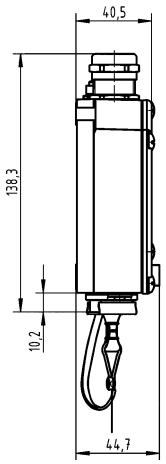
Han® PushPull Metal Outlet acc. to IEC 61 076-3-117 variant 14
Cat. 6_A, 8 poles

Advantages

- Simple mounting, fixing and earth connection both outside
- Fast termination of data cables due to Ha-VIS preLink® technology
- Structured cabling for industrial premises
- Mating face AIDA compliant, protection cover incl.
- PROFINET compatible

Technical characteristics

Number of ports, Copper / Termination	2 x Han® PushPull (V14) RJ45 (IP65 / IP67) or Han® 3 A RJ45
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Termination	preLink®
Wire gauge	AWG 24 … 22 (0.25 mm² … 0.34 mm²) solid and stranded
Strand diameter	Ø 1.3 mm … 1.6 mm
Cable diameter	7.2 mm … 8 mm
Shielding	Fully shielded 360° flexible shielding termination
Mounting	Wall mounting
Dimensions (H x W x D)	105 x 105 x 40.5 mm
Degree of protection	IP65 / IP67
Operating temperature range	-40 °C … +70 °C
Housing material	Aluminium, die-cast
Colour	Black

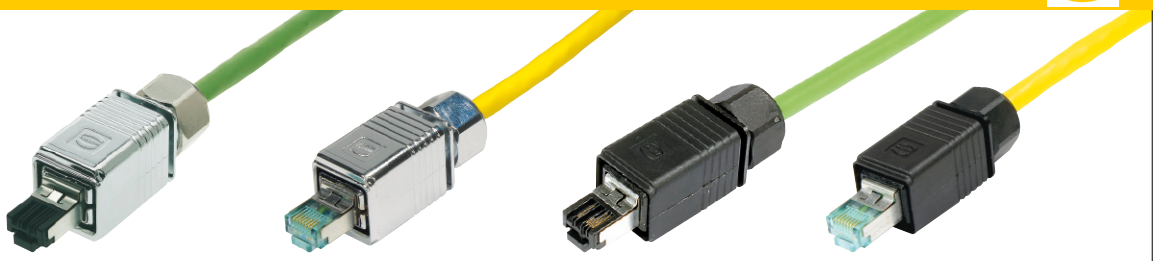
Identification	Part number	Drawing	Dimensions in mm
preLink® Han® PushPull Metal Outlet consists of: • 1x Housing including protection covers • 2x preLink® Set RJ45 jack AWG 22/23 • 2x Cable gland with slotted seal • 1x Assembly instruction	20 82 104 0101		

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

Identification	Part number	Drawing	Dimensions in mm
Han® PushPull protection cover IP65 / IP67			
for device side			
without fixing cord	09 35 002 5403 XL[1)]		
with fixing cord	09 35 002 5402 09 35 002 5402 XL[1)]		
with nylon fixing cord	09 35 002 5404 09 35 002 5404 XL[2)]		
Han® PushPull protection cover IP65 / IP67			
for cable side			
without fixing cord	09 35 002 5411		
with nylon fixing cord	09 35 002 5413		

[1)] Packaging with 100 pieces
[2)] Packaging with 250 pieces

PushPull RJ45 IP65 / IP67 connectors



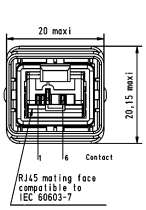
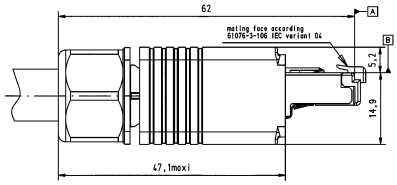
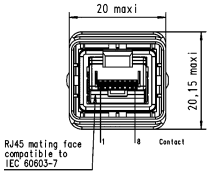
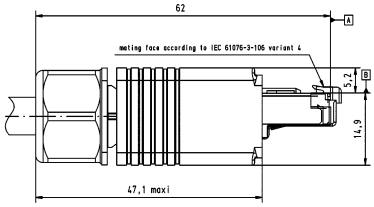
HARTING PushPull acc. to IEC 61 076-3-106 variant 4
RJ45 connector

Advantages

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

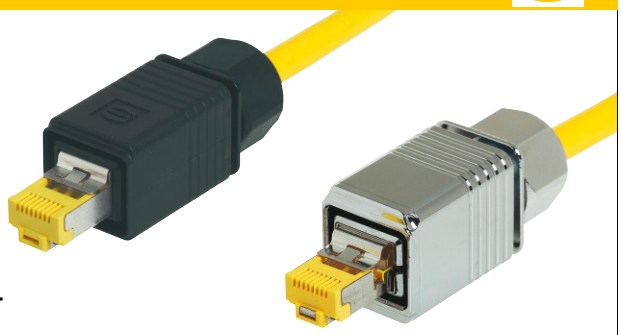
Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Degree of protection	IP65 / IP67
Mating face	RJ45 acc. to IEC 60 603-7
Cable diameter	4.9 … 8.6 mm
Termination cross section	
Cat. 5	AWG 24/7 … AWG 22/7 (stranded) AWG 23/1 … AWG 22/1 (solid)
Cat. 6_A	AWG 24/7 … AWG 28/7 (stranded)
Mating cycles	min. 750
Temperature range	-40 °C … +70 °C
Housing material	Plastic, black Zinc die-cast, shining
Flammability acc. to UL 94	V0
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
Connector, 4 poles Cat. 5			
incl. housing with RJ45 connector, shielding and cable gland	09 45 145 1100 09 45 195 1100 (metal version)		
Connector, 8 poles Cat. 6_A			
incl. housing with RJ45 connector, shielding and cable gland	09 45 145 1520 09 45 145 1520 XL[1)] 09 45 195 1520 (metal version)		
suitable assembly tool	09 45 800 0520		

[1)] Packaging with 100 sets

PushPull RJ45 IP65 / IP67 connectors



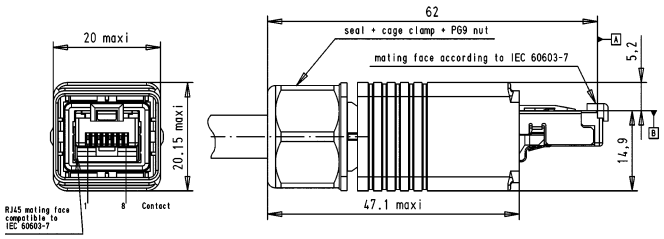
HARTING PushPull acc. to IEC 61 076-3-106 variant 4
RJ45 connector

Advantages

- Ethernet connector based on RJ45
- Fully shielded, 360° shielding contact
- Field-assembly connector with IDC contacts
- Category of transmission: Cat. 6 / Class E_A suitable for 1/10 Gbit Ethernet

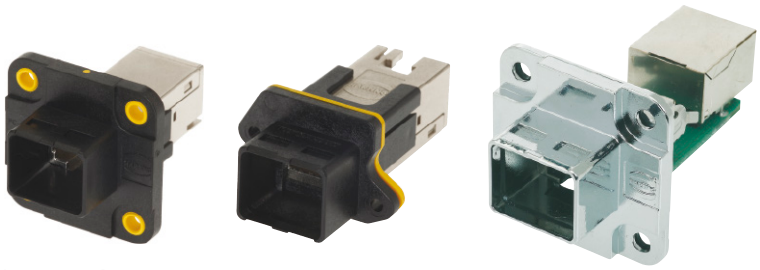
Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Mating face	RJ45 acc. to IEC 60 603-7
Cable diameter	4.9 … 8.6 mm
Termination cross section	AWG 27/7 … AWG 22/7 (stranded) AWG 24/1 … AWG 22/1 (solid)
Conductor diameter	max. 1.6 mm (incl. insulation)
Mating cycles	min. 750
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material	Plastic, black Zinc die-cast, shining
Flammability acc. to UL 94	V0
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
Connector, 8 poles Cat. 6 incl. housing with RJ45 connector, shielding and cable gland	09 45 145 1560 09 45 145 1560 XL[1)] 09 45 195 1560 (metal version)		
Colour clips for colour coding the HARTING PushPull connectors			
White	09 45 840 0011		
Yellow	09 45 840 0013		
Red	09 45 840 0017		
Blue	09 45 840 0018		
Green	09 45 840 0019		

[1)] Packaging with 100 sets

PushPull RJ45 IP65 / IP67 connectors



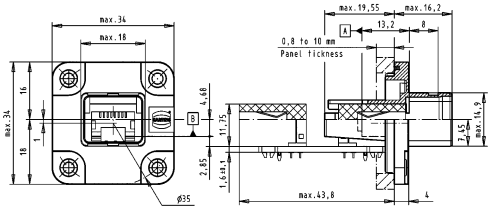
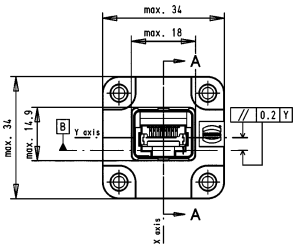
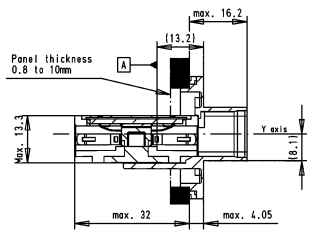
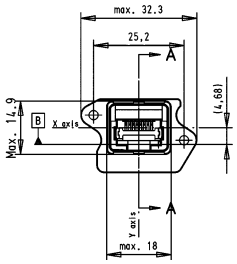
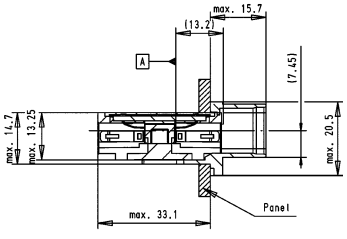
HARTING PushPull acc. to IEC 61 076-3-106 variant 4
RJ45 panel feed-throughs

Advantages

- Small, space-saving PushPull Interfaces in IP65 / IP67
- Easy handling of RJ45 patch cords in switch cabinets or sets
- Mounting to casings

Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Transmission rate Cat. 5 versions	10/100/1000 Mbit/s
Transmission rate Cat. 6 versions	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mating cycles	min. 750
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material	Plastic, black Zinc die-cast, shining
Flammability acc. to UL 94	V0
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
Panel feed-through set category of transmission Cat. 5			
incl. housing bulkhead mounting EasyInstall metal with integrated seal, 2 x RJ45-jack board drillings for M3	09 45 295 1130		
Panel feed-through set category of transmission Cat. 6			
incl. housing bulkhead mounting EasyInstall with integrated seal, 2 x RJ45-jack board drillings for M3	09 45 245 1590		
incl. housing bulkhead mounting Compact, with integrated seal, 2 x RJ45-jack	09 45 245 1560		

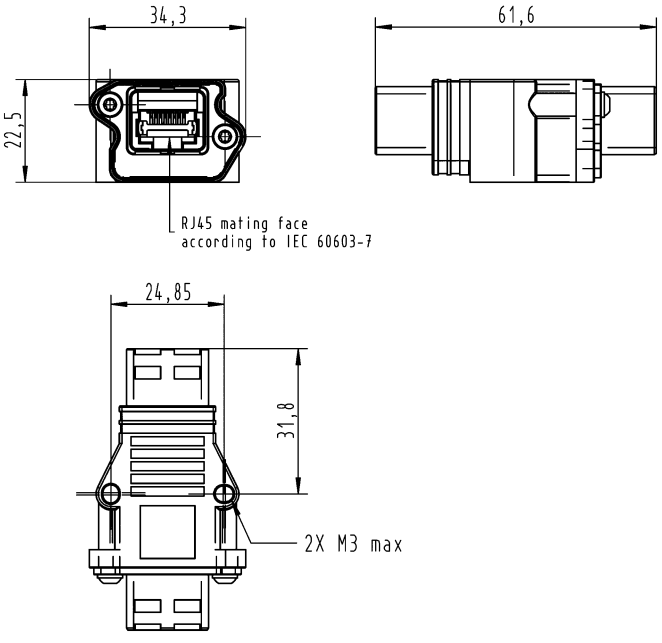
HARTING PushPull acc. to IEC 61 076-3-106 variant 4
RJ45 – bulkhead

Advantages

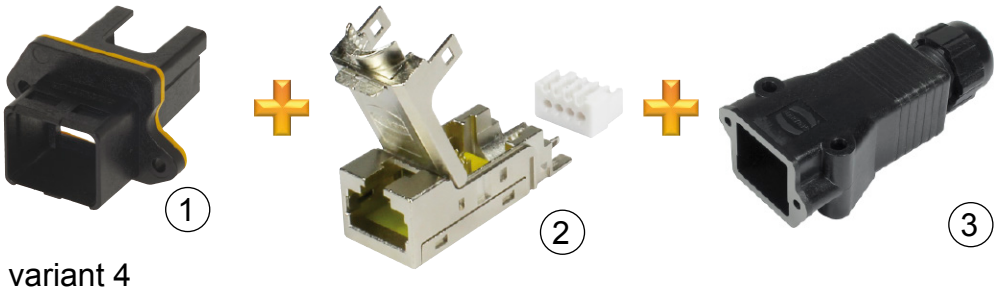
- Small, space-saving PushPull Interfaces in IP65 / IP67
- Easy connection of PushPull RJ45 system cords
- Screwable with 2 x M3 screws

Technical characteristics

Locking	PushPull Technology acc. to IEC 61 076-3-106 variant 4
Number of contacts	8
Transmission category	Cat. 6, performance class E_A, suitable for 1/10 Gigabit Ethernet
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mating cycles	min. 750
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material	Plastic, black
Flammability acc. to UL 94	V0
	UL approval (E102079)

Identification	Part number	Drawing	Dimensions in mm
HARTING PushPull RJ45 – bulkhead	09 45 345 1560		

PushPull RJ45 IP65 / IP67 connectors



HARTING PushPull
acc. to IEC 61 076-3-106 variant 4
Housing bulkhead mounting and housing cable-to-cable combinations

Advantages

• Type / Material	RJ45 plastic
• Category	5 / 6_A
• Number of wires	4 / 8
• Termination	IDC
• Outer diameter	5 - 9 mm

Application

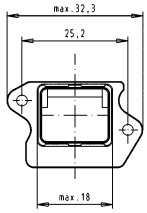
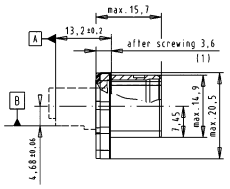
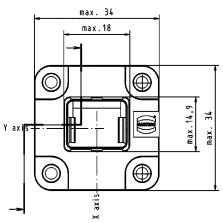
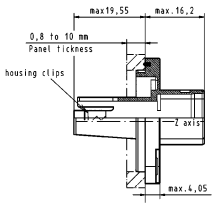
- Industrial cabling
- On machines and control units
- Outdoor

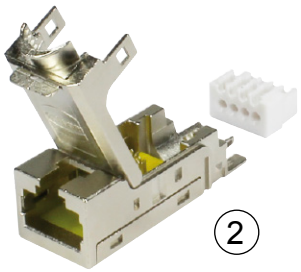
Benefits

- HARTING PushPull technology
- Compact design
- High packing density
- Device integration via RJ45 PCB connectors

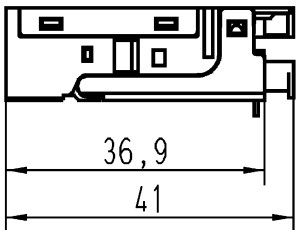
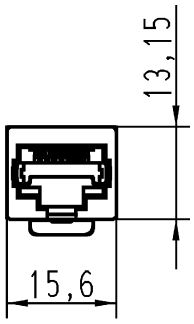
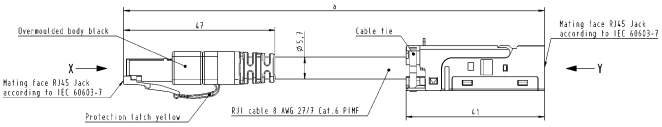
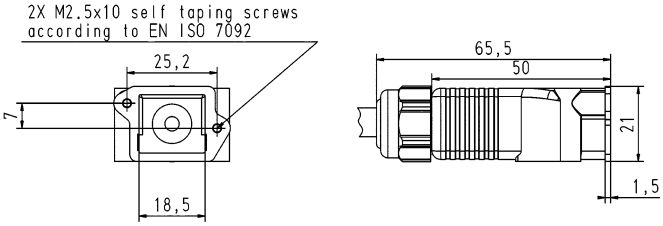
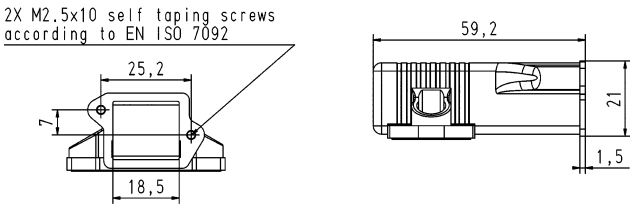
Technical characteristics

Connector type	HARTING PushPull (V4) RJ45 connector acc. to IEC 61 076-3-106 variant 4
Number of contacts	4 or 8 depending on type
Transmission performance	Category 5 / 6_A depending on type
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s depending on type
Shielding	fully shielded, 360° shielding contact
Cable termination	tool-less with IDC contacts or preLink® IDC
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material	polycarbonate, UL 94 V0, black

Identification	Part number	Drawing	Dimensions in mm
HARTING PushPull V4 Housing bulkhead mounting (1)			
Housing bulkhead mounting – Compact with integrated seal, mounting drills for M2.5 plastic, black	09 45 545 0028		
Housing bulkhead mounting – EasyInstall with integrated seal, mounting drills for M3 plastic, black (Not combinable with (3) !)	09 45 545 0032		



HARTING PushPull,
type acc. to IEC 61076-3-106 variant 4
Housing bulkhead mounting and housing cable-to-cable combinations

Identification	Part number	Drawing	Dimensions in mm
RJ45 female inserts (2)			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1120		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 28-24 solid and stranded	09 45 545 1561		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1562		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 solid and stranded	20 82 001 0001		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 27/26 solid and stranded	20 82 001 0002		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001 / 20 82 000 0003)	20 82 000 0002		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s RJ45 system cable jack on connector 0.15 m	09 45 545 1500 up to		
10.0 m	09 45 545 1518		
HARTING PushPull Housing cable-to-cable (3)			
plastic, black for cable outer diameter 6.5 … 9.5 mm	09 45 345 0000		
HARTING PushPull Housing bulkhead mounting			
extern, plastic, black	09 45 345 0001		
(Not combinable with EasyInstall Housing bulkhead mounting 09 45 545 0032!)			

HARTING PushPull acc. to IEC 61 076-3-106 variant 4
RJ45 Outlet, Cat. 6, 8 poles

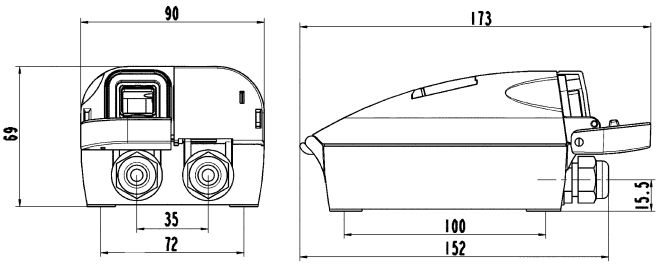
Advantages

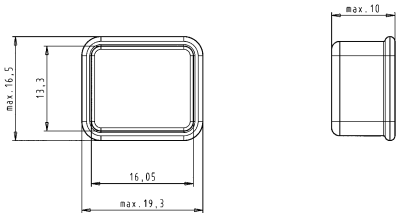
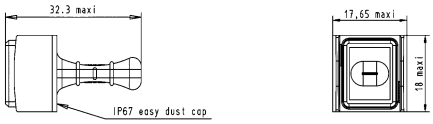
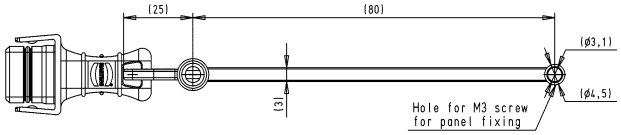
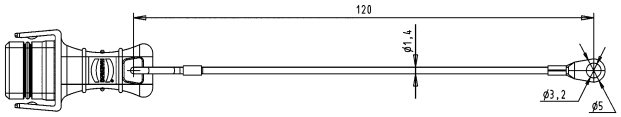
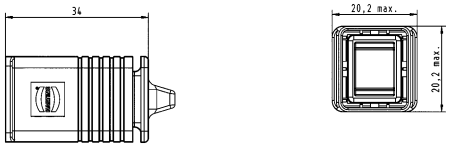
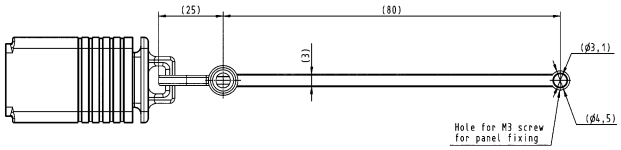
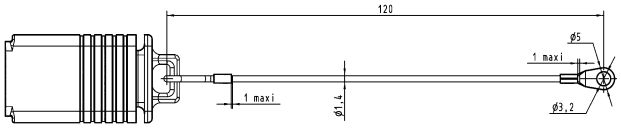
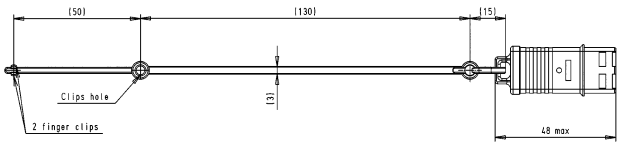
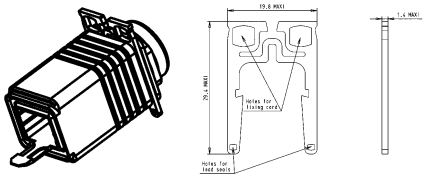
- Simple mounting
- Cable entering optionally from bottom or from top side
- Self-closing protection caps in IP65 / IP67
- IP65 / IP67 label

Technical characteristics

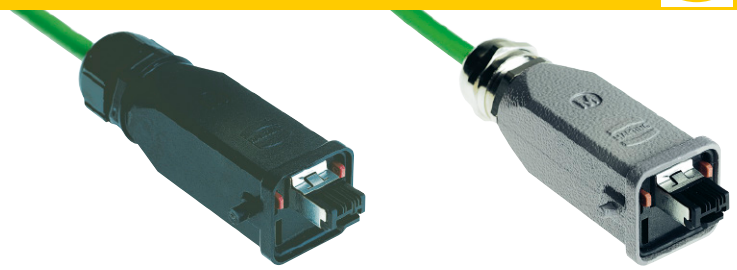
Number of ports, Copper / Termination	2 x HARTING PushPull (V4) RJ45 (IP65 / IP67)
Transmission performance	Category 6 / Class E up to 250 MHz according to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s
Termination	Via IDC contacts, tool-less
Wire gauge	AWG 24 … 22 (0.25 mm² … 0.34 mm²) solid and stranded
Strand diameter	0.7 mm … 1.6 mm
Cable diameter	6 mm … 9 mm
Shielding	Fully shielded, 360° shielding contact
Mounting	Wall mounting
Dimensions (H x W x D)	152 x 90 x 69 mm
Degree of protection	IP65 / IP67
Operating temperature range	-20 °C … +70 °C
Housing material	polycarbonate, UL94 V-0
Colour	Black (similar RAL 9011) or White (similar RAL 9010)

Identification	Part number	Drawing	Dimensions in mm
HARTING PushPull RJ45 Outlet			
Black	09 45 845 1500		
white	09 45 845 1501		
consisting of: 2-port outlet housing with protection caps, cable management, cable glands and label 2x RJ45 female modules, Category 6 1x blind plug (if only only 1 cable is used) Assembly instructions			



Identification	Part number	Drawing	Dimensions in mm
Transport protecion for device side IP40	09 45 845 0003		
Protection cover for device side IP65 / IP67			
Version with passive locking without cord	09 45 845 0009 024		
Version with passive locking with plastic cord for fixing screw M3	09 45 845 0009		
Version with passive locking with nylon cord for fixing screw M2.5 / M3	09 45 845 0011 024		
Version with active locking without cord	09 45 845 0015		
Version with active locking with plastic cord for fixing screw M3	09 45 845 0014		
Version with active locking with nylon cord for fixing screw M2.5 / M3	09 45 845 0013		
Protection cover for connectors IP65 / IP67	09 45 845 0010		
Security clip for connectors can be sealed and protects against unauthorized unplugging	09 45 845 0020		
Blinding plate to close PushPull Compact panel cuttings	09 45 845 0019		

Han® 3 A RJ45 IP65 / IP67 connectors



Han® 3 A connector RJ45, 4 poles, Cat. 5

Advantages

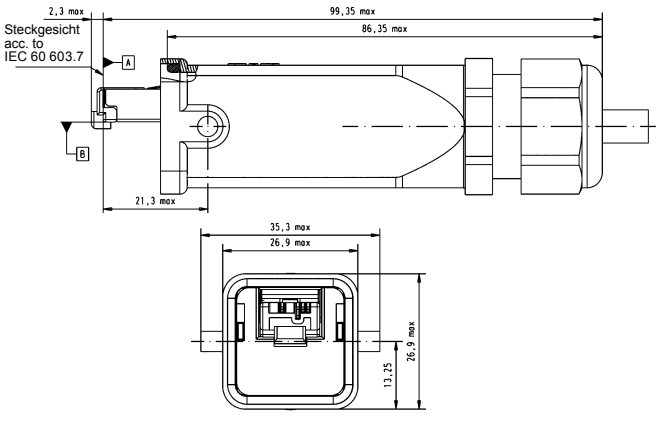
- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Category of transmission Cat. 5
- Compact design and very robust housing
- Suitable for termination of solid and stranded cables
- Up to 10 x reconductable
- PROFINET compatible
- Min. 500 mating cycles

Technical characteristics

Connector type	Han® 3 A Connector RJ45 acc. to IEC 61076-3-106 variant 5
Number of contacts	4
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO / IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Cable termination	tool-less with IDC contacts
Conductor cross section	
stranded	AWG 24/7 - AWG 22/7
solid	AWG 23/1 - AWG 22/1
Conductor diameter	max. 1.6 mm
Cable outer diameter	6.5 mm – 9.5 mm
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material	
Plastic version	polycarbonate, UL 94 V0, black
Metal versions	
Standard	Zinc die-cast, powder coating grey
M-version	Zinc die-cast, powder coating black

Identification		Part number
Han® 3 A connector set RJ45, 4 poles incl. housing, cable gland and instruction manual		
Plastic version, black	straight	09 45 125 1100
	angled	09 45 125 1104
Metal version Standard, grey	straight	09 45 115 1100
	angled	09 45 115 1104
Metal version M, black	straight	09 45 115 1102
	angled	09 45 115 1106
Coding pin set		09 45 820 0000

Drawing — Dimensions in mm



Dimensions valid for plastic version, straight

Connecting hardware

Han® 3 A RJ45 IP65 / IP67 connectors

Han® 3 A RJ45 10G connector, 8 poles, Cat. 6

Advantages

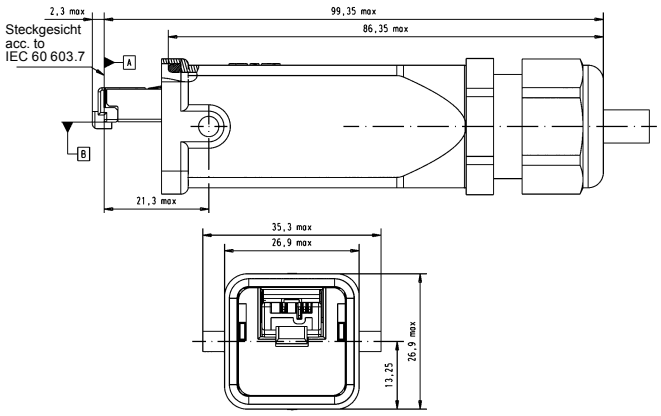
- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Category of transmission Cat. 6
- Compact design and very robust housing
- Suitable for termination of solid and stranded cables
- PROFINET compatible
- Min. 500 mating cycles

Technical characteristics

Connector type	Han® 3 A Connector RJ45 acc. to IEC 61076-3-106 variant 5
Number of contacts	8
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO / IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Cable termination	tool-less with IDC contacts
Conductor cross section	
stranded	AWG 27/7 - AWG 22/7
solid	AWG 24/1 - AWG 22/1
Conductor diameter	max. 1.6 mm
Cable outer diameter	6.5 mm – 9.5 mm
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material	
Plastic version	polycarbonate, UL 94 V0, black
Metal versions	
Standard	Zinc die-cast, powder coating grey

Identification		Part number
Han® 3 A RJ45 connector, 8 poles incl. housing, cable gland and instruction manual		
Plastic version, black	straight	09 45 125 1560
Metal version Standard, grey	straight	09 45 115 1560
Han® 3 A RJ45 connector insert can be combined with Han® 3 A housing	straight	09 45 100 1560
Coding pin set		09 45 820 0000

Drawing — Dimensions in mm



Dimensions valid for plastic version, straight

Han® 3 A RJ45 IP65 / IP67 connectors

Han® 3 A connector set RJ45, 8 poles, Cat. 6_A

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with mounting tool
- Category of transmission Cat. 6_A
- Compact design and very robust housing
- Min. 500 mating cycles

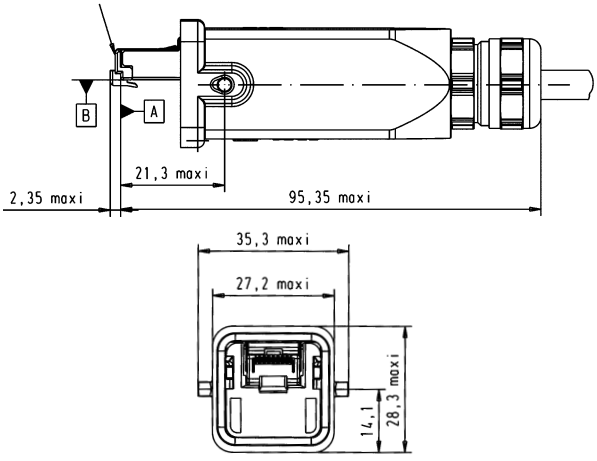
Technical characteristics

Connector type	Han® 3 A Connector RJ45
Number of contacts	8
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Cable termination	with piercing contacts
Conductor cross section	AWG 28/7 - AWG 24/7, stranded
Conductor diameter	max. 1.05 mm
Cable outer diameter	6.5 mm – 9.5 mm
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material	
Plastic version	polycarbonate, UL 94 V0, black
Metal versions	
Standard	Zinc die-cast, powder coating grey
M-version	Zinc die-cast, powder coating black

Identification	Part number
Han® 3 A connector set RJ45, 8 poles, Cat. 6 incl. housing, cable gland and instruction manual	
Plastic version, black	09 45 125 1520
Metal version Standard, grey	09 45 115 1520
Metal version M, black	09 45 115 1522
Han® 3 A RJ45 connector insert can be combined with Han® 3 A housing	09 45 100 1520
Coding pin set	09 45 820 0000
suitable assembly tool	09 45 800 0520

Drawing — Dimensions in mm

Mating face acc. to IEC 60 603-7



Dimensions valid for metal version Standard

Connecting hardware

Han® 3 A RJ45 IP65 / IP67 connectors

Han® 3 A RJ45 connector

Advantages

• Type / Material	RJ45 plastic, metal
• Category	5 / 6_A
• Number of wires	4 / 8
• Termination	IDC
• Outer diameter	5 - 13 mm

Application

- Industrial cablings
- On machines, devices and control units

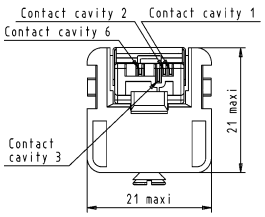
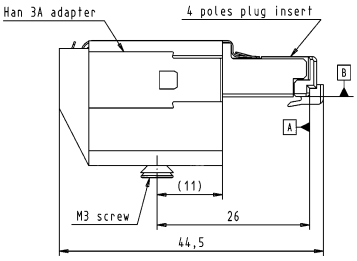
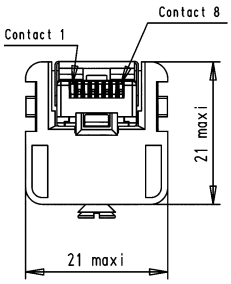
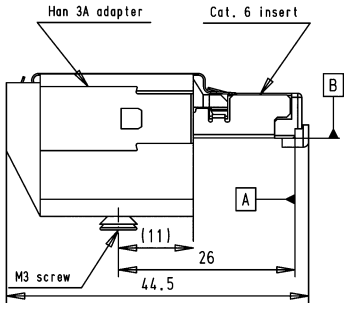
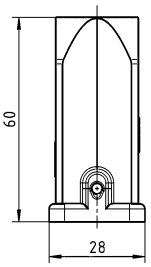
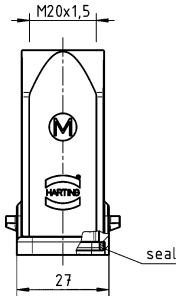
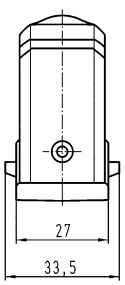
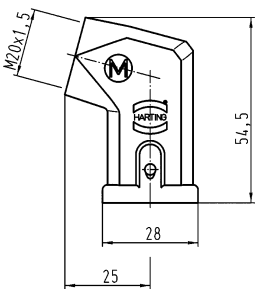
Benefits

- RJ45 Ethernet-Data connector suitable for industry
- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Compact design and very robust housing
- Suitable for termination of solid and stranded cables
- PROFINET compatible
- Min. 500 mating cycles

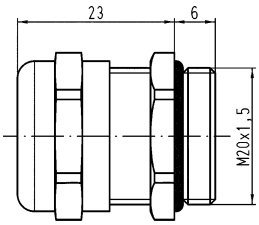
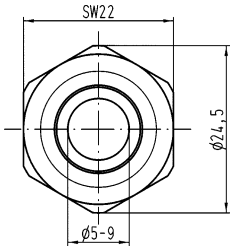
Technical characteristics

Connector type	Han® 3 A connector RJ45 acc. to IEC 61076-3-106 variant 5
Number of contacts	4 / 8 depending on type
Transmission performance	Category 5 / 6_A depending on type
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Cable termination	tool-less with IDC contacts or preLink® IDC
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material plastic version metal version Standard M version	 polycarbonate, UL 94 V0, black Zinc die-cast, powder coating grey Zinc die-cast, powder coating black

Han® 3 A RJ45 connector

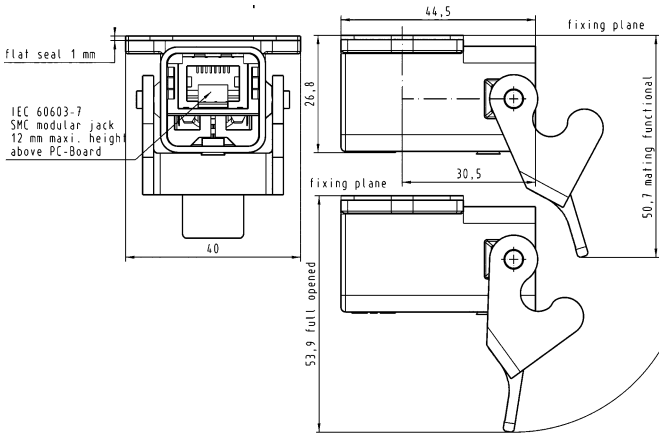
Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 connector inserts ①			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded	09 45 100 1100		
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 26-24 solid and stranded	09 45 100 1110		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 27-22 solid and stranded	09 45 100 1560		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s piercing termination for AWG 28-26 stranded	09 45 100 1520		
Cat. 6_A, 4/8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001 / 20 82 000 0003)	20 82 002 0001		
Han® 3 A connector housing M20 ② (with glued seal)			
straight cable entry:			
– metal, grey	19 20 003 1443		
– metal, black	19 37 003 1443		
– plastic, grey	19 20 003 0423		
– plastic, black	19 20 003 0423		
– metal, EMC	19 62 003 1443		
– stainless steel	19 44 003 1443		
angled cable entry:			
– metal, grey	19 20 003 1643		
– metal, black	19 37 003 1643		
– plastic, grey	19 20 003 0623		
– plastic, black	19 20 003 0626		
– metal, EMC	19 62 003 1643		
– stainless steel	19 44 003 1643		

Han® 3 A RJ45 connector

Identification	Part number	Drawing	Dimensions in mm
M20 cable glands ③			
metal:			
– 5 … 9 mm	19 00 000 5080		
– 5 … 12 mm	19 00 000 5081		
– 6 … 12 mm	19 00 000 5082		
– 10 … 14 mm	19 00 000 5084		
plastic, grey:			
– 5 … 9 mm	19 00 000 5180		
– 6 … 12 mm	19 00 000 5182		
– 10 … 14 mm	19 00 000 5184		
plastic, black:			
– 5 … 9 mm	19 00 000 5181		
– 6 … 12 mm	19 00 000 5183		
– 10 … 14 mm	19 00 000 5185		
metal, EMC version:			
– 6.5 … 9.5 mm	19 62 000 5080		
– 4.0 … 6.5 mm	19 62 000 5081		
– 7.0 … 10.5 mm	19 62 000 5082		
– 9.0 … 13.0 mm	19 62 000 5084		
stainless steel:			
– 6 … 13 mm	19 44 000 5082		
Accessories			
coding pin set for 4 different codings	09 45 820 0000		

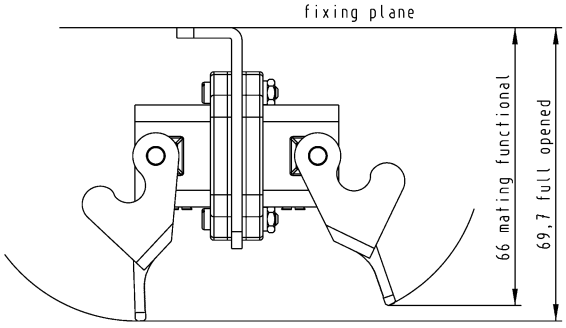
Han® 3 A RJ45 panel feed-throughs and couplings Cat. 5

Identification		Part number	Drawing	Dimensions in mm
Panel feed-through set, 8 poles				
Plastic version, black	angled	09 45 225 1108		
Metal version Standard, grey	angled	09 45 215 1108		
Metal version M, black	angled	09 45 215 1109		
Coding pin set for 4 different codings		09 45 820 0000		



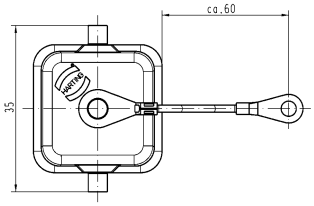
Dimensions valid for plastic version

Double coupling, 8 poles incl. installation frame metal				
Plastic version, black		09 45 225 1107		
Metal version Standard, grey		09 45 215 1107		
Metal version M, black		09 45 215 1110		
Coding pin set for 4 different codings		09 45 820 0000		



Dimensions valid for plastic version

Protection cover for panel feed-through IP65 / IP67 with seal				
Plastic version, black		09 20 003 5449		
Metal version Standard, grey		09 20 003 5425		
Metal version M, black		09 37 003 5405		



Dimensions valid for plastic version

Han® 3 A RJ45 IP65 / IP67 connectors

Han® 3 A RJ45 10G Cat. 6 – panel feed-throughs

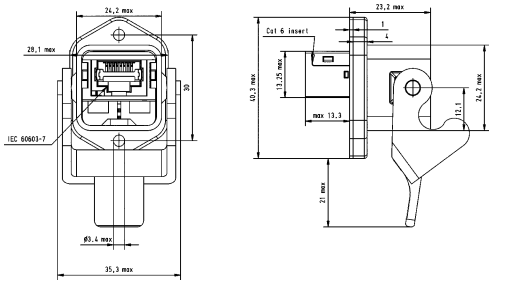
Advantages

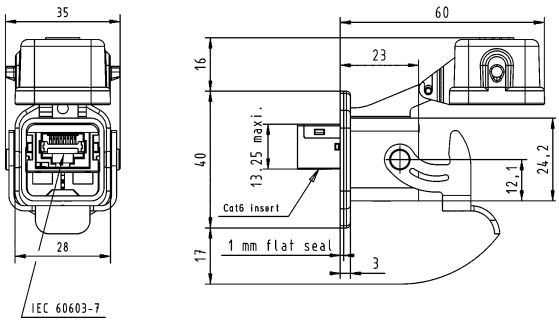
- Compact and robust design
- 360° shielding
- Easy mounting
- Transmission Category 6, performance class E_A, suitable for 1/10 Gigabit Ethernet
- RJ45 mating compatible
- Coding (4 variants) possible

Technical characteristics

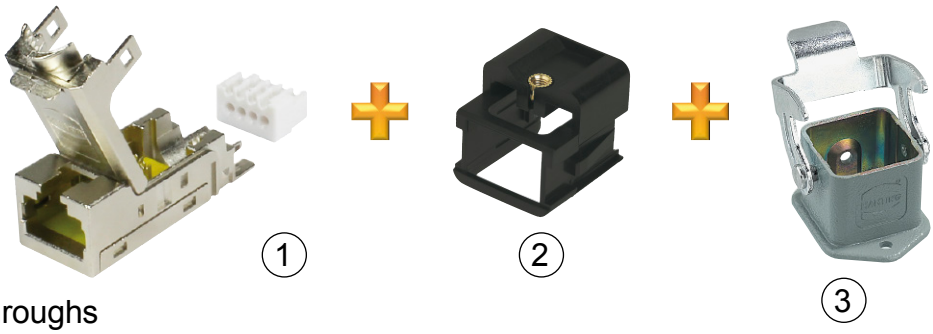
Number of ports	2 / 1x Han® 3 A RJ45 (IP65 / IP67) 1x RJ45 (IP20)
Transmission performance	Category 6 / Class E_A acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Mounting	Screwable to cover plates
Degree of protection	IP65 / IP67
Mating cycles	min. 500
Temperature range	-40 °C … + 70 °C
Housing material Plastic version Metal version	 polycarbonate, black, UL 94 V0 Zinc die-cast, powder-coated

Identification	Part number	Drawing	Dimensions in mm
Panel feed-through set, 8 poles			
Plastic version, black	09 45 225 1560		
Metal version Standard, grey	09 45 215 1560		
Metal version M, black	09 45 215 1561		
Metal version Standard, grey, with self-closing protective cap	09 45 215 1562		
Han® 3 A RJ45 10G insert Cat. 6 (for Han® 3 A housings)	09 45 200 1560		





Han® 3 A RJ45 IP65 / IP67 connectors



Han® 3 A RJ45 panel feed-throughs

Advantages

- Type / Material: RJ45, plastic, metal
- Category: 5 / 6_A
- Number of wires: 4 / 8
- Termination: IDC
- Outer diameter: 5 - 9 mm

Application

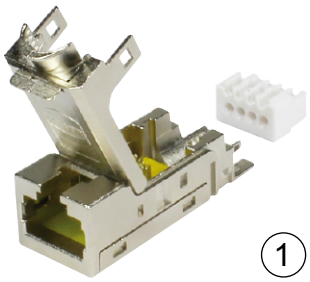
- Industrial cablings
- On machines, devices and control units

Benefits

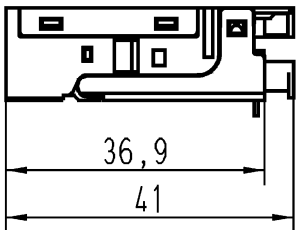
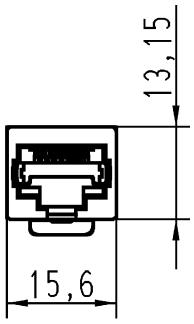
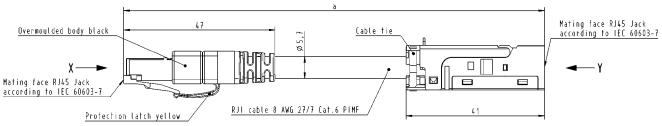
- Compact and robust design
- 360° shielding
- Easy mounting
- RJ45 mating compatible
- Coding (4 variants) possible

Technical characteristics

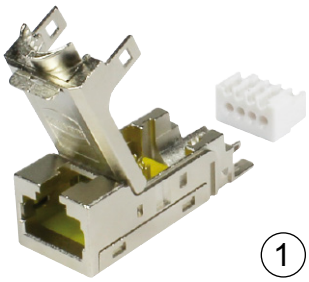
Connector type	Han® 3 A connector RJ45 acc. to IEC 61076-3-106 variant 5
Number of contacts	4 / 8 depending on type
Transmission performance	Category 5 / 6_A depending on type
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Cable termination	tool-less with IDC contacts or preLink® IDC
Cable outer diameter	6.5 mm – 9.5 mm
Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Housing material plastic version metal version Standard M version	 polycarbonate, UL 94 V0, black Zinc die-cast, powder coating grey Zinc die-cast, powder coating black



Han® 3 A RJ45 panel feed-throughs

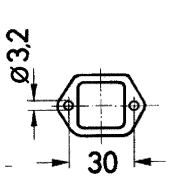
Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 female inserts ①			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1120		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 28-24 solid and stranded	09 45 545 1561		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1562		
Cat. 6_A, 4/8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003)	20 82 001 0001		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s RJ45 system cable jack on connector			
0.15 m	09 45 545 1500		
…	…		
10.0 m	09 45 545 1518		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s RJ45 coupler with Han® 3 A adapter 	09 45 200 1560		
Han® 3 A adapter for HIFF inserts ②	09 45 515 0024		

Han® 3 A RJ45 IP65 / IP67 connectors

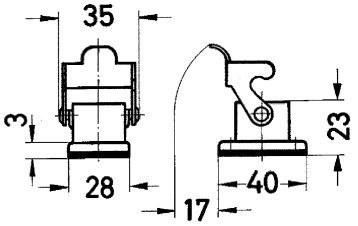


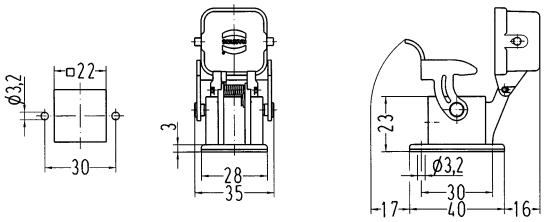
Han® 3 A RJ45 panel feed-throughs

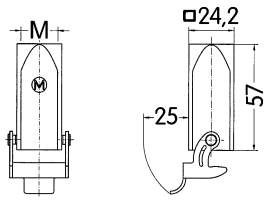
Identification	Part number	Drawing	Dimensions in mm
Han® housing ③			
Housing bulkhead mounting			
– metal, grey	09 20 003 0301		
– metal, black	09 37 003 0301		
– plastic, grey	09 20 003 0320		
– plastic, black	09 20 003 0327		
– metal, EMC	09 62 003 0301		
– stainless steel	19 44 003 0301		
Housing bulkhead mounting with self-locking cap			
– metal, grey	09 20 003 0306		
– metal, black	09 37 003 0306		
– metal, EMC	09 62 003 0306		
Housing cable-to-cable[1)2)]			
– metal, grey	19 20 003 1750		
– metal, black	19 37 003 1750		
– plastic, grey	19 20 003 0720		
– plastic, black	19 20 003 0727		
– metal, EMC	19 62 003 1750		
Housing surface mounting, flange closed[1)2)]			
– metal, grey	19 20 003 1252		
– metal, black	19 37 003 1250		
– plastic, grey	19 20 003 0220		
– plastic, black	19 20 003 0227		
– metal, EMC	19 62 003 1250		
– stainless steel	19 44 003 1250		

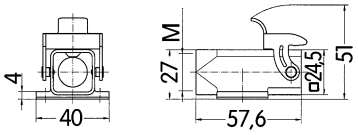


Dimensions valid for
Metal version Standard





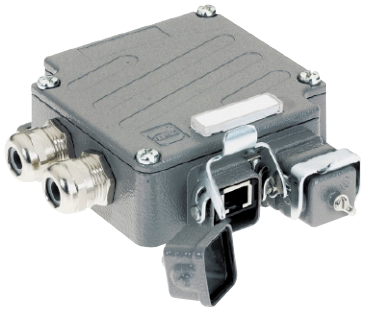




[1)] The small wall at the adapter 09 45 515 0024 must be removed
[2)] M20 cable glands are listed at Han® 3 A connectors

Accessories			
coding pin set for 4 different codings	09 45 820 0000		

[1)] Modification of the adapter 09 45 515 0024 needed
[2)] M20 cable glands see page 03.71



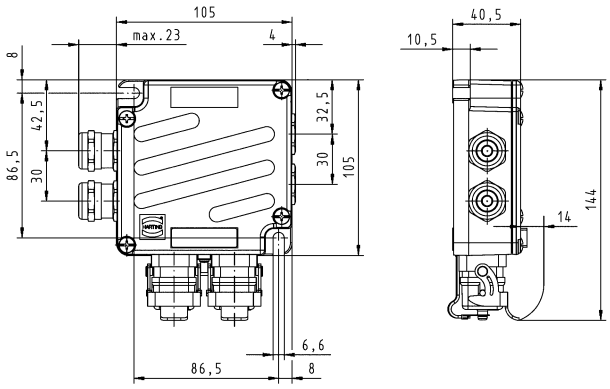
Han® 3 A RJ45
Metal Outlet, Cat. 5, 8 poles

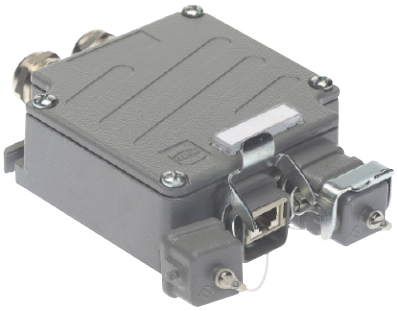
Advantages

- Robust metal housing for use in harsh industrial environments
- Simple mounting
- Cable feeding optionally from the left or from the right side
- Lockable Han® 3 A connector ports
- PROFINET compliant

Technical characteristics

Number of ports, Copper / Termination	2 x Han® 3 A (V5) RJ45 (IP65 / IP67)
Transmission performance	Category 5 / Class D up to 100 MHz according to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Termination	LSA-PLUS module, terminating via LSA-PLUS tool
Strand diameter	AWG 26 … 22 (0.35 mm … 0.65 mm) solid and stranded
Strand insulation	0.7 mm … 1.6 mm
Cable diameter	5 mm … 9 mm
Shielding	Fully shielded, 360° shielding contact
Mounting	Wall mounting
Dimensions (H x W x D)	105 x 105 x 40.5 mm
Degree of protection	IP65 / IP67
Operating temperature range	-40 °C … +70 °C
Housing material	Aluminium, die-cast
Colour	Grey RAL 7037

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 Metal Outlet, Cat. 5 consisting of: 2-port metal housing with protection caps, cable glands and blanking piece PCB module with LSA-PLUS strips Label Assembly instructions	09 45 815 1100		



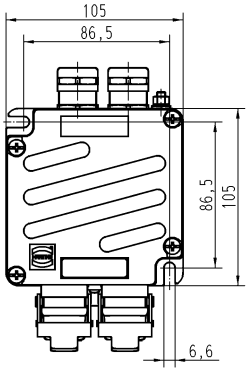
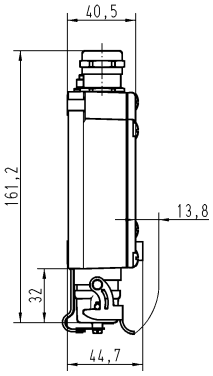
Han® 3 A
Metal Outlet, Cat. 6_A, 8 pole

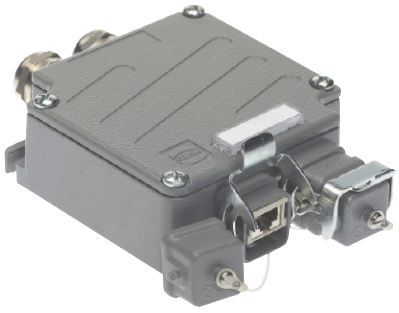
Advantages

- Simple mounting, fixing and earth connection both outside
- Fast termination of data cables due to Ha-VIS preLink® technology
- Structured cabling for industrial premises
- Mating face AIDA compliant, protection cover incl.
- PROFINET compatible

Technical characteristics

Number of ports, Copper / Termination	2 x Han® 3 A (V5) RJ45 (IP65 / IP67)
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Termination	preLink® IDC
Wire gauge	AWG 24 … 22 (0.25 mm² … 0.34 mm²) solid and stranded
Strand diameter	Ø 1.3 mm … 1.6 mm
Cable diameter	7.2 mm … 8 mm
Shielding	Fully shielded 360° flexible shielding termination
Mounting	Wall mounting
Dimensions (H x W x D)	105 x 105 x 40.5 mm
Degree of protection	IP65 / IP67
Operating temperature range	-40 °C … +70 °C
Housing material	Aluminium, die-cast
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
preLink® Han® 3 A Metal Outlet consists of: • 1x Housing including protection covers • 2x preLink® Set RJ45 jack AWG 22/23 • 2x Cable gland with slotted seal • 1x Assembly instruction	20 82 102 0101		



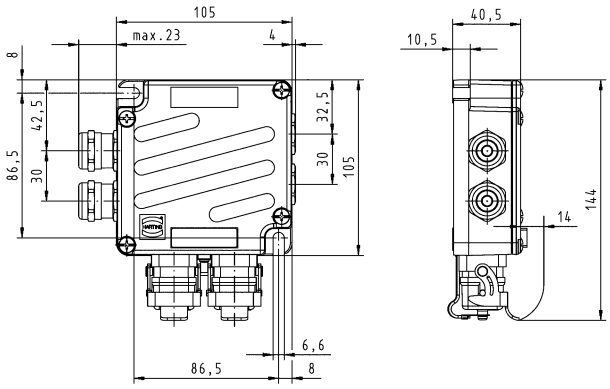
Han® 3 A RJ45
Metal Outlet, Cat. 6_A, 8 pole

Advantages

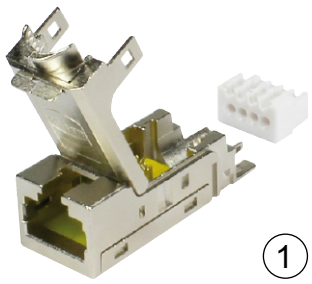
- Robust metal housing for use in harsh industrial environments
- Simple mounting
- Cable feeding optionally from the left or from the right side
- Lockable Han® 3 A connector ports

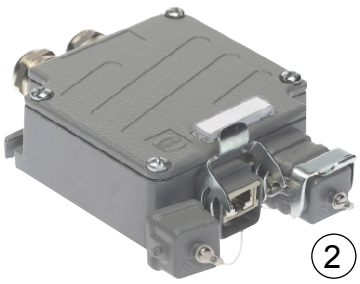
Technical characteristics

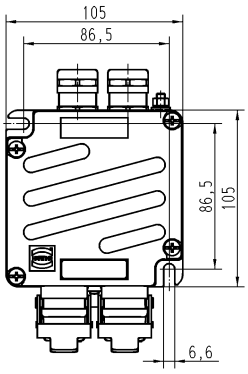
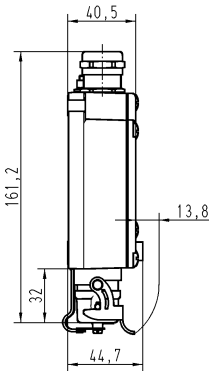
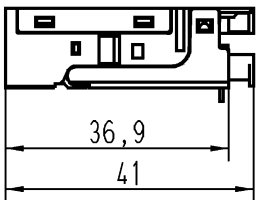
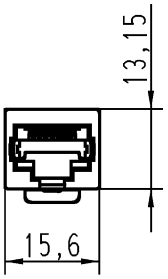
Number of ports, Copper / Termination	2 x Han® 3 A (V5) RJ45 (IP65 / IP67)
Transmission performance	Category 6_A / Class E up to 500 MHz according to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Termination	IDC
Strand diameter	AWG 24 … 22 solid and stranded
Strand insulation	0.7 mm … 1.6 mm
Cable diameter	5 mm … 9 mm
Shielding	Fully shielded, 360° shielding contact
Mounting	Wall mounting
Dimensions (H x W x D)	105 x 105 x 40.5 mm
Degree of protection	IP65 / IP67
Operating temperature range	-40 °C … +70 °C
Housing material	Aluminium, die-cast
Colour	Grey RAL 7037

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 Metal Outlet, Cat. 6_A consisting of: 2-port metal housing with protection caps, cable glands and blanking plug, 2 x RJ45 cable jack 09 45 545 1562 Label Assembly instructions	09 45 815 1560		

Han® 3 A RJ45 Metal Outlet





Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 junction box empty ①			
For fixture of 2x RJ45 female inserts	09 45 815 0000		
RJ45 female inserts ②			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1120		
Cat. 6$_A$, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 28-24 solid and stranded	09 45 545 1561		
Cat. 6$_A$, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1562		
Cat. 6$_A$, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 solid and stranded	20 82 001 0001		
Cat. 6$_A$, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 27/26 solid and stranded	20 82 001 0002		
Cat. 6$_A$, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001 / 20 82 000 0003)	20 82 000 0002		

Han® 3 A RJ45 Hybrid IP65 / IP67 connectors

Han® 3 A RJ45, Hybrid

Advantages

• Type / Material	Han® 3 A RJ45 Hybrid (V5), plastic, metal
• Category	5 / 6 / 6_A
• Number of contacts	4 / 8 data + 4 power
• Termination	IDC
• Cable diameter	5 - 14 mm

Application

- Industrial cablings
- Within switch cabinets
- On machines and control units

Benefits

- Robust design
- Use on-site made possible via IP65 / IP67 protection
- Easy handling for applications with additional power supply
- PROFINET compliant

Technical characteristics

Connector	
Degree of protection	IP65 / IP67
Mating interface	RJ45, 4 poles acc. to IEC 60603-7 plus 4x power
Temperature range	-40 °C … +70 °C
Housing material	
Plastic version	UL 94 V0, black
Metal version	Zinc die-cast, grey
Mating cycles	min. 500
Mounting	field-assembly
Data Cat. 5, 4 poles	
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO / IEC 11801:2002, prEN 50173-1
Transmission rate	10/100 Mbit/s
Cable diameter	
stranded	AWG 24/7 - AWG 22/7
solid	AWG 23/1 - AWG 22/1
Data Cat. 6, 8 poles	
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO / IEC 11801:2002, prEN 50173-1
Transmission rate	10/100 Mbit/s / 1 Gbit/s
Cable diameter	
stranded / solid	AWG 27 - AWG 22
Both, data Cat. 5 and Cat. 6	
Shielding	fully shielded, 360° shielding contact
Cable outer diameter	10.0 mm – 11.0 mm
Power	
Number of contacts	4 for cable diameter 1.5 mm² stranded
Working voltage	48 V / DC
Working current	16 A, see current carrying capacity
	UL approved (E102079)
Panel feed-through	
Mating interface extern:	RJ45 female acc. to IEC 60603-7 plus 4 x power
Mating interface intern:	RJ45 female acc. to IEC 60603-7 4 x power via cable cage clamp 1.5 mm²

Han® 3 A RJ45 Hybrid IP65 / IP67 connectors

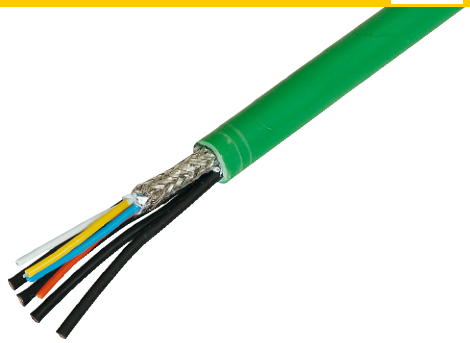
Han® 3 A RJ45, Hybrid

Identification	Part number	Drawing	Dimensions in mm
Connector, Cat. 5, 4 + 4 poles (IDC termination for RJ45 insert)			
Plastic version, black	09 45 125 1300		
Metal version Standard, grey	10 12 005 2001		
Connector, Cat. 6, 8 + 4 poles (IDC termination for RJ45 insert)			
Plastic version, black	09 45 125 1760		
Metal version Standard, grey	09 45 115 1760		
Connector insert for Han® 3 A housings	09 45 100 1760		
Connector, Cat. 6, 8 + 4 poles (with piercing connection AWG 28/7 - 24/7)			
Plastic version, black	09 45 125 1720		
Metal version Standard, grey	09 45 115 1720		
Connector insert for Han® 3 A housings	09 45 100 1720		
suitable assembly tool	09 45 800 0520		
Protection cover for connector IP65 / IP67 without seal			
Plastic version, black	09 20 003 5442		
Metal version Standard, grey	09 20 003 5422		
Metal version M	09 37 003 5402		

Dimensions valid for plastic version

Han® 3 A RJ45 Hybrid connectors

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 connector inserts ①			
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 27-22 solid and stranded	09 45 100 1760		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s piercing termination for AWG 28-26 stranded	09 45 100 1720		
Han® 3 A connector housing M20 (with glued seal) ②			
straight cable entry:			
– metal, grey	19 20 003 1443		
– metal, black	19 37 003 1443		
– plastic, grey	19 20 003 0423		
– plastic, black	19 20 003 0423		
– metal, EMC	19 62 003 1443		
– stainless steel	19 44 003 1443		
angled cable entry:			
– plastic, grey	19 20 003 0623		
– plastic, black	19 20 003 0626		
M20 cable glands ③			
metal:			
– 5 … 9 mm	19 00 000 5080		
– 5 … 12 mm	19 00 000 5081		
– 6 … 12 mm	19 00 000 5082		
– 10 … 14 mm	19 00 000 5084		
plastic, grey:			
– 5 … 9 mm	19 00 000 5180		
– 6 … 12 mm	19 00 000 5182		
– 10 … 14 mm	19 00 000 5184		
plastic, black:			
– 5 … 9 mm	19 00 000 5181		
– 6 … 12 mm	19 00 000 5183		
– 10 … 14 mm	19 00 000 5185		
metal, EMC version:			
– 6.5 … 9.5 mm	19 62 000 5080		
– 4.0 … 6.5 mm	19 62 000 5081		
– 7.0 … 10.5 mm	19 62 000 5082		
– 9.0 … 13.0 mm	19 62 000 5084		
stainless steel:			
– 6 … 13 mm	19 44 000 5082		



PROFINET Type B cable, Hybrid
Industrial Cat. 5 Hybrid cable, 4-wire + 4x Power
to make up Hybrid system cables

Advantages

- Robust design for industrial environment
- PROFINET-conform
- Additional power supply
- Hybrid Cat. 5 cable, 4-wire + 4x Power

Technical characteristics

Cable construction	Star quad + 4 Power cables, double shielded
Core structure	4 x AWG 22/7 + 4 x 1.5 mm² (conductor 84 x 0.15 mm²)
Sheath material	FRNC, halogen free
Cable outer diameter	9.7 mm
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Temperature range	-20 °C … +70 °C
Colour	Green

Identification	Part number	Drawing	Dimensions in mm
PROFINET Type B cable, Hybrid Industrial Cat. 5 Hybrid cable, 4-wire + 4x Power			
10 m ring	09 45 600 0310		
20 m ring	09 45 600 0330		
50 m ring	09 45 600 0340		
100 m ring	09 45 600 0300		
500 m reel	09 45 600 0320		

Industrial Cat. 6 Hybrid
Installation cable, 8-wire

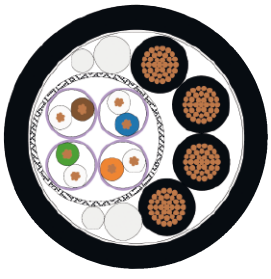
Advantages

- Robust design for industrial environment
- PROFINET-conform
- Additional power supply
- Hybrid Cat. 6 cable, 4-wire + 4x Power

Technical characteristics

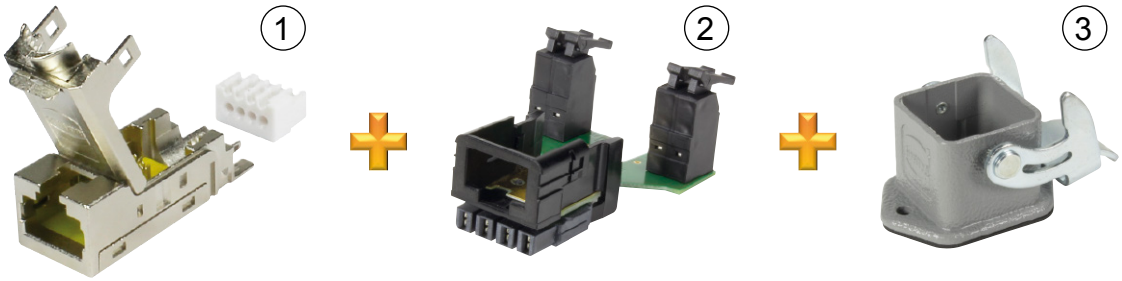
Cable structure	4 x 2, Twisted Pair, shielded, PIMF 4 power cores
Core structure	4 x 2 x AWG 26/7, stranded 4x 84 * 0.15 mm (cord 1.5 mm²), stranded
Sheath material	PUR
Cable sheath diameter	10 … 10.6 mm
Transmission performance	Category 6 / Class E up to 250 MHz according to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-20 °C … +80 °C
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
Industrial Cat. 6 Hybrid installation cable, 8-wire PUR			
20 m ring	09 45 600 0332		
50 m ring	09 45 600 0342		
100 m drum	09 45 600 0302		

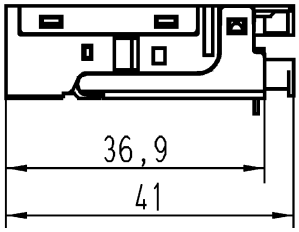
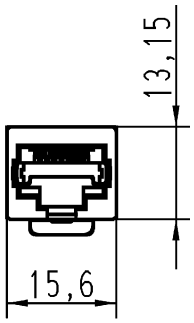
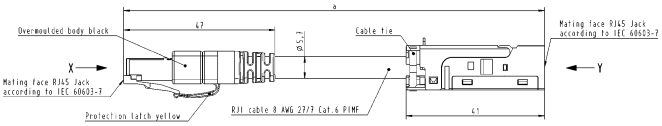
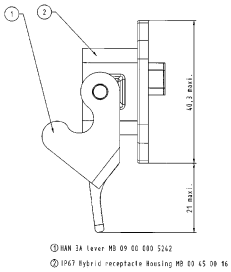
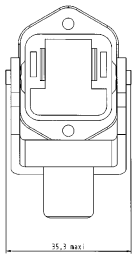


Han® 3 A, Hybrid, panel feed-throughs

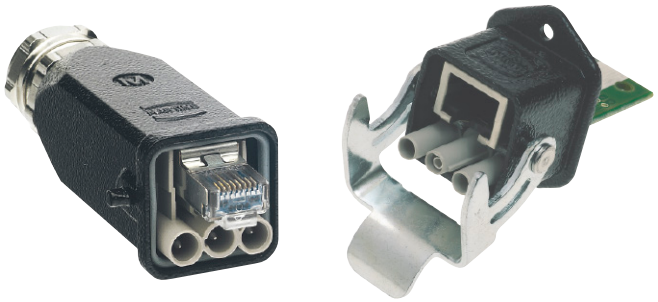
Identification	Part number	Drawing	Dimensions in mm
Panel feed-through set			
Plastic version, black, Cat. 5	09 45 225 1300		
Metal version Standard, grey, Cat. 5	10 12 005 1002		
Metal version M, black, Cat. 5	09 45 215 1301		
Metal version Standard, grey, Cat. 6	09 45 215 1760		
Metal version M, black, Cat. 6	09 45 215 1761		
Metal version EMC, Cat. 6	09 45 215 1762		
Metal version EMC, Cat. 6 with anti-interference capacitor	09 45 215 1765		
Protection cover for panel feed-through IP65/IP67			
Plastic version, black	09 20 003 5449		
Metal version Standard, grey	09 20 003 5425		
Metal version M, black	09 37 003 5405		



Han® 3 A RJ45 Hybrid IP65 / IP67 connectors

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 female inserts ①			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1120		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 28-24 solid and stranded	09 45 545 1561		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1562		
Cat. 6_A, 4/8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003)	20 82 001 0001		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s RJ45 system cable jack on connector			
0.15 m	09 45 545 1500		
…	…		
10.0 m	09 45 545 1518		
Han® 3 A RJ45 Hybrid adapter for HIFF inserts with power modules ②	09 45 200 1760		
Han® housing ③			
Housing bulkhead mounting:			
– metal, grey	10 12 005 1004		
– metal, black	09 45 515 0027		
– metal, EMC	09 45 515 0028		

Han® 3 A RJ45 Hybrid



Han® 3 A RJ45 Hybrid

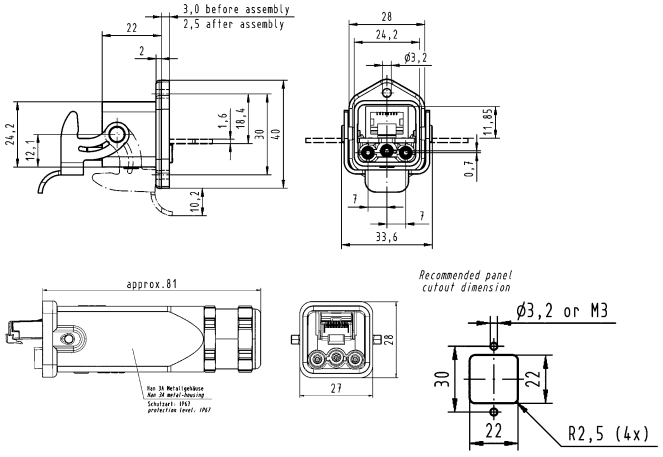
Advantages

- RJ45 Ethernet-Data connector suitable for industry with Power contacts for hybrid applications
- Field-assembly with mounting tool
- Category of transmission Cat. 5
- Compact design and very robust housing
- Suitable for termination with solid and stranded cables
- Protection against direct contact on cable and device side according to EN 60529

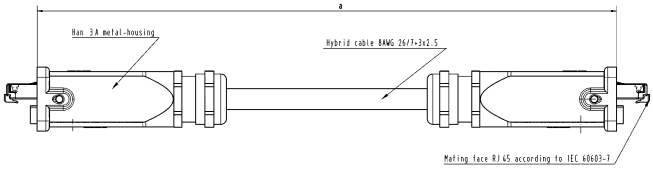
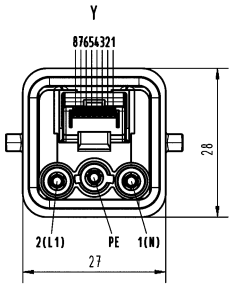
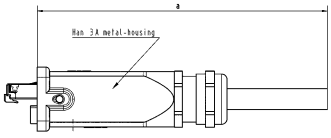
Technical characteristics

Degree of protection	IP65 / IP67
Mating interface	RJ45, 8 poles acc. to IEC 60603-7 plus 3x power
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, powder coating black
Data	
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO / IEC 11801:2002, EN 50173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	fully shielded, 360° shielding contact
Cable diameter stranded	AWG 28/7 - AWG 24/7
Power	
Number of contacts	3 (AC: L1, PE, N / DC: V+, GND, V-)
Working voltage	300 V AC/DC
Working current	12 A @ 70 °C (see current carrying capacity Han D® contacts)
Cable diameter	2.5 mm²

Identification	Part number	Drawing	Dimensions in mm
Components device side incl. 3x Han D® female contacts			
AC version	09 57 368 0512 000		
DC version	09 57 368 0513 000		
Cable side Connector incl. 3x Han D® male contacts			
AC version	09 57 308 0500 000		
DC version	09 57 308 0501 000		
suitable assembly tool	09 45 800 0520		



Hybrid cable assembly

Identification	Part number	Drawing	Dimensions in mm
Hybrid cable, double ended, 4 x 2 x AWG 26/7 + 3 x 2.5 mm²		double ended	
Length: 1 m			
AC version	33 57 211 0010 001		
DC version	33 57 211 0010 002	a = length	
Length: 5 m			
AC version	33 57 211 0050 001		
DC version	33 57 211 0050 002		
Length: 10 m			
AC version	33 57 211 0100 001		
DC version	33 57 211 0100 002		
Length: 20 m			
AC version	33 57 211 0200 001		
DC version	33 57 211 0200 002		
Hybrid cable, single ended, 4 x 2 x AWG 26/7 + 3 x 2.5 mm²			
Length: 1 m			
AC version	33 57 111 0010 002	Protection level: IP65 / IP67	
DC version	33 57 111 0010 001		
Length: 5 m		Data part: Transmission properties in accordance with ISO / IEC 11 801:2002: Class D	
AC version	33 57 111 0050 002		
DC version	33 57 111 0050 001		
Length: 10 m		single ended	
AC version	33 57 111 0100 002		
DC version	33 57 111 0100 001		
Length: 20 m			
AC version	33 57 111 0200 002		
DC version	33 57 111 0200 001	a = length	
Hybrid outdoor cable			
Length: 10 m	33 57 851 0100 001		PVC jacket
Length: 20 m	33 57 851 0200 001		4 x 2 x AWG 26/7 + 3 x 2.5 mm²
Length: 500 m	33 57 851 5000 001		Outer diameter: 12 mm
			Min. bending radius: single: 5 x OD, repeated: 10 x OD

Han® 3 A LC duplex Hybrid

Han® 3 A LC duplex Hybrid

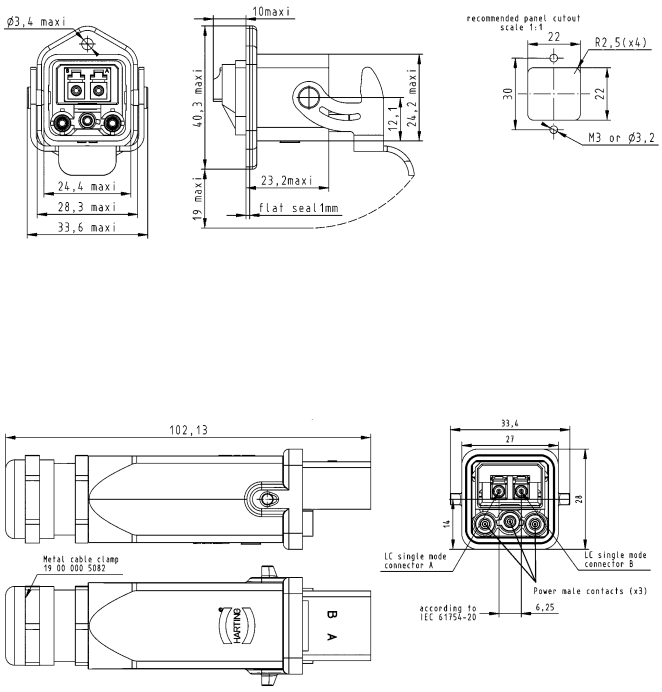
Advantages

- Small form factor (compared to SC and ST®)
- Compact, space-saving Design
- Combined to only one LWL-module for high mechanical load
- High packing density
- A & B parts identification according to TIA 568 standard

Technical characteristics

Degree of protection	IP65 / IP67
Temperature range	-40 °C … +70 °C
Data	
Mating module	LC duplex (2 fibres)
Cable diameter	6.0 … 9.0 mm
Power	
Number of contacts	3 (AC: L1, PE, N / DC: V+, GND, V-)
Working voltage	300 V AC/DC
Working current	12 A @ 70°C
Housing material	Aluminium die-cast, black

Identification		Part number	Drawing	Dimensions in mm
Components device side				
Power: 3x Han D® male contacts				
Data: Multi mode GOF	AC	09 57 568 0500 000		
	DC	09 57 568 0510 000		
Data: Single mode GOF	AC	09 57 568 0501 000		
	DC	09 57 568 0511 000		
Connector				
Power: 3x Han D® female contacts				
Data: Multi mode GOF	AC	09 57 508 0500 000		
	DC	09 57 508 0510 000		
Data: Single mode GOF	AC	09 57 508 0501 000		
	DC	09 57 508 0511 000		



Connecting hardware

Notes

Description of the Han-Modular® system

The Han-Modular® series is designed for combining different transmission media in one connector. The multifaceted system of inserts, contacts, frames, hoods and housings as well as accessories fulfils individual customer requirements. The customer can choose between more than 50 different modules. These are suitable for different transmission media and cover various termination techniques.

Modules

+

Hinged frame

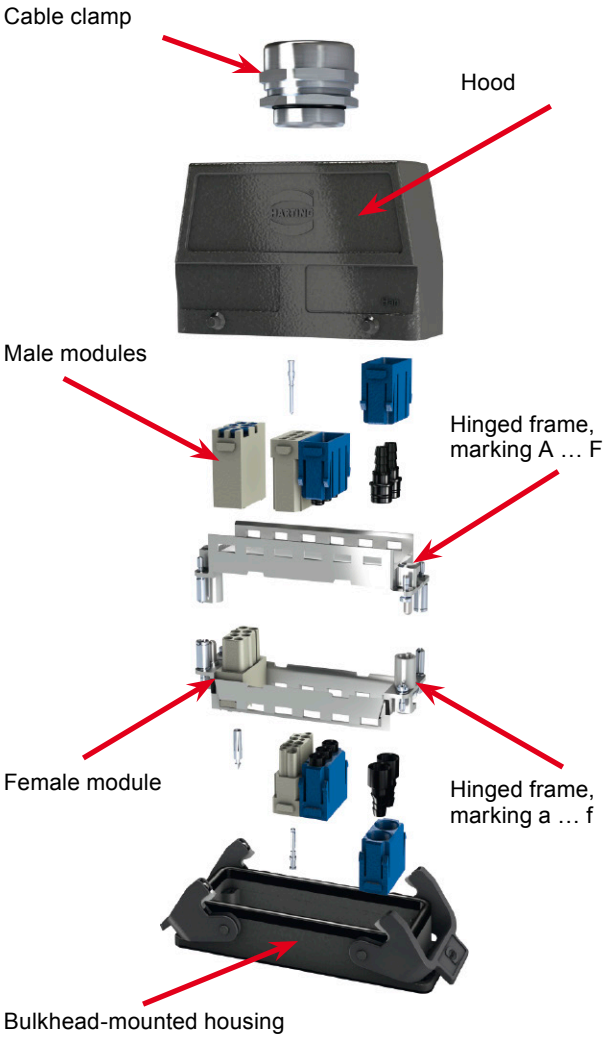
+

Enclosures

→ **Han-Modular® Connectors**

The patented Han-Modular® hinged frame enables the configuration of all modules in the well-accepted Han® hoods and housings. Further additional solutions are available, e.g. suitable docking frames for drawer units. Individual customer requirements can be realised by means of the Han-Modular® series. Combining various transmission media in one single connector results in lower expenditures in installation time and production downtime. Space savings and cost savings are further benefits. The easy extension possibilities secure the ideal solution for an actual as well as future safe design.

System description

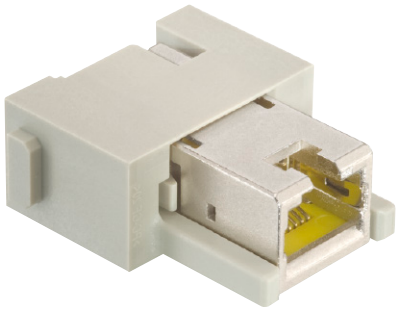


Han® RJ45 module, female

Number of contacts

8

50 V
1 A



Features

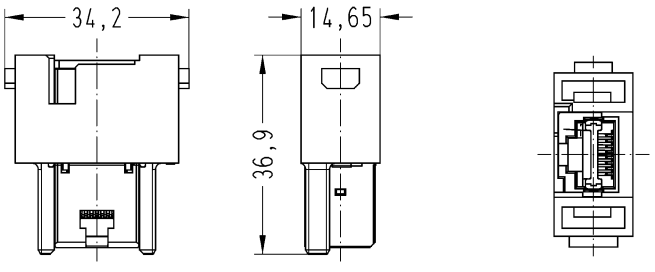
- Single module with standard shielded RJ45 plug and jack
- Cat. 6 for all data pairs (all 8 pins)
- RoHS compliant
- Patch cables are assembled/removed without tools

Specifications / Approvals

IEC 60664-1
IEC 61984

Technical characteristics

Contacts	8
Electrical data acc. to IEC 61984	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
Rated voltage acc. to UL	30 V
Insulation resistance	≥ 10^{10} Ohm
Limiting temperatures	-40 °C … 70 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate
Colour (insert)	RAL 7032 (light grey)
Transmission characteristics	Category 6 / Class E up to 250 MHz, according to ISO/IEC 11801:2002 and EN 50173-1
Data rate copper	10 Mbit/s, 100 Mbit/s, 1000 Mbit/s, 10000 Mbit/s

Identification	Part number	Drawing	Dimensions in mm
Han-Modular®, Han® RJ45 module Gender changer, for patch cable, Cat. 6	09 14 001 4721		

Han® RJ45 Module with preLink® and IDC termination

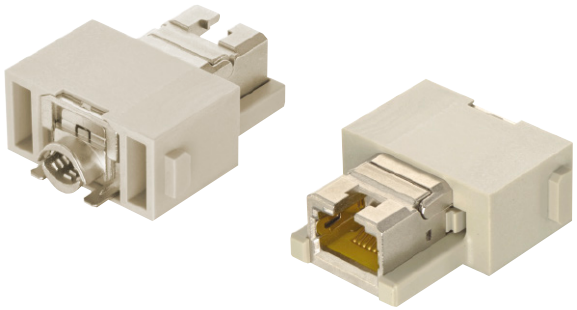
Features

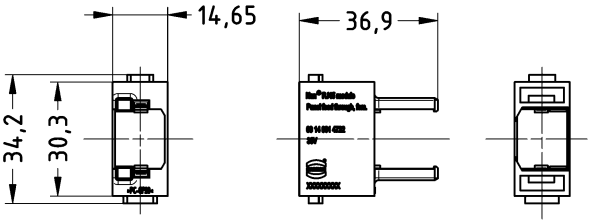
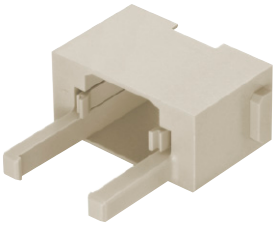
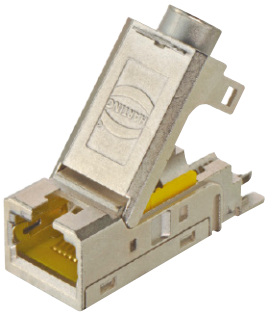
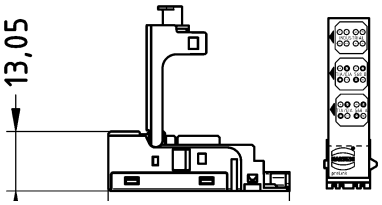
- Compatible with Han® RJ45 male module (e.g. 09 14 001 4623)
- Category of transmission Cat. 6
- Field-assembly with *HARAX*®
- 360° shielding

Technical characteristics

Number of contacts	8
Transmission	Category 6, Class E_A, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 / Class E_A up to 500 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 28 … AWG 24 AWG 24 … AWG 22
- Conductor diameter	max. 1.6 mm (incl. insulation)
- Cable diameter	5 … 9 mm
Mating cycles	≥ 500
Temperature range	-40 °C … +70 °C
Housing material	Zinc die-cast, nickel-plated

Han® RJ45 Module with preLink® and IDC termination



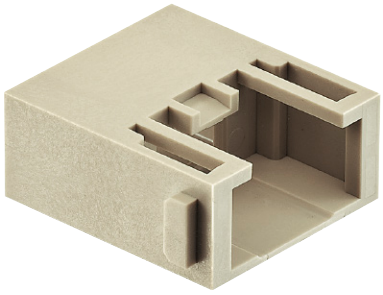
Identification	Part number	Drawing	Dimensions in mm
Han® RJ45 Module, female			
RJ45 cable jack, order separately	09 14 001 4722		
			
Han® RJ45 cable jack			
			
8-poles, Cat. 6, preLink® termination AWG 23 - 22	09 14 008 4720		
8-poles, Cat. 6, IDC termination AWG 28 - 24	09 14 545 1561		
8-poles, Cat. 6, IDC termination AWG 24 - 22	09 14 545 1562		
4-poles, Cat. 5, IDC termination AWG 23 - 22	09 14 545 1120		

Han® RJ45 module, male

Number of contacts

4, 8

50 V
1 A



Features

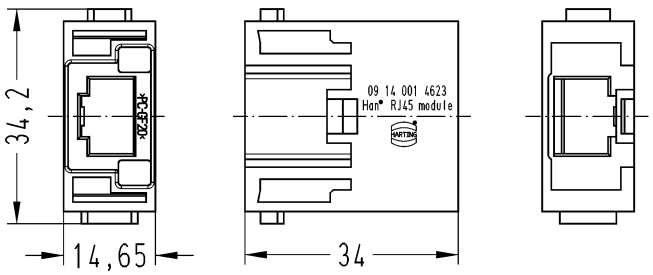
- Single module with standard shielded RJ45 plug and jack
- The RJ45 inserts are protected by a reliable plastic insulator
- 360° shielded contact
- Field assembly without tools possible by means of *HARAX*® rapid termination in IDC technology
- Gigalink: Field assembly by means of piercing contacts
- Suitable for termination of massive and flexible wires
- Gigalink: Suitable for termination of flexible wires

Technical characteristics

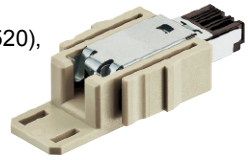
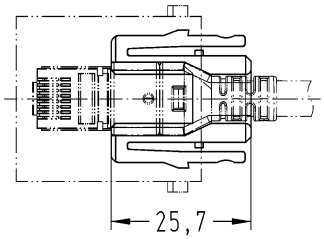
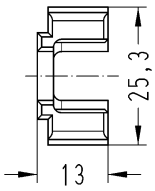
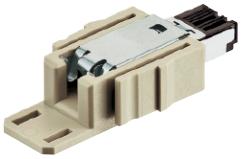
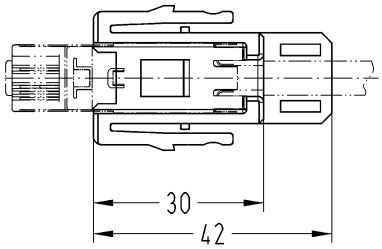
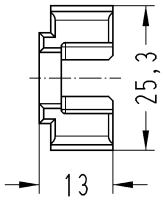
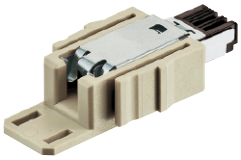
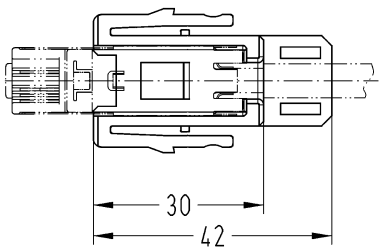
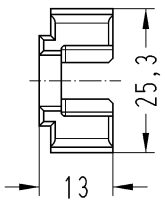
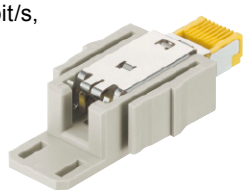
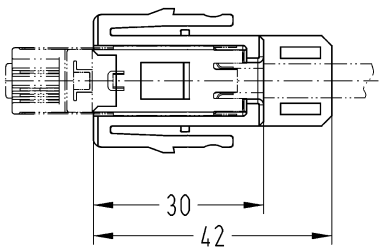
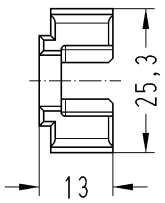
Contacts	8, 4
Electrical data acc. to IEC 61984	1 A 50 V 0.8 kV 3
Rated current	1 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Rated voltage acc. to UL	30 V
Insulation resistance	≥ 10^{10} Ohm
Limiting temperatures	-40 °C … 70 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate, polyamide
Colour (insert)	RAL 7032 (light grey)
Transmission characteristics	Category 6_A / Class E_A up to 500 MHz, acc. to ISO/IEC 11801:2002 and EN 50173-1, Category 5 / Class D up to 100 MHz, acc. to ISO/IEC 11801:2002 and EN 50173-1, Category 6 / Class E up to 250 MHz, acc. to ISO/IEC 11801:2002 and EN 50173-1
Data rate copper	10 Mbit/s, 100 Mbit/s, 1000 Mbit/s, 10000 Mbit/s

Specifications / Approvals

IEC 60664-1
IEC 61984
IEC 60603-7

Identification	Part number	Drawing	Dimensions in mm
Han-Modular®, Han® RJ45 module for adapter	09 14 001 4623		

Han® RJ45 module, male

Identification	Part number	Drawing	Dimensions in mm
Han-Modular®, Han® RJ Industrial adapter RJ Industrial RJ45 Gigalink connector set, AWG 28/7 … 24/7, 10 Mbit/s, 100 Mbit/s, 1000 Mbit/s, 10000 Mbit/s, piercing contacts (use tool: 09 45 800 0520), Cat. 6_A 	09 45 400 1520	 Wire outside diameter ≤ 1.05 mm	
Han-Modular®, Han® RJ Industrial adapter RJ Industrial RJ45 connector set, AWG 24 … 22, 10 Mbit/s, 100 Mbit/s, IDC contacts, Cat. 5 	09 45 400 1100	 Wire outside diameter ≤ 1.6 mm	
Han-Modular®, Han® RJ Industrial adapter RJ Industrial RJ45 connector set, AWG 26, 10 Mbit/s, 100 Mbit/s, IDC contacts, Cat. 5 	09 45 400 1109	 Wire outside diameter ≤ 1.6 mm	
Han-Modular®, Han® RJ Industrial adapter RJ Industrial RJ45 connector set, AWG 27 … 22, 10 Mbit/s, 100 Mbit/s, 1000 Mbit/s, 10000 Mbit/s, IDC contacts, Cat. 6 	09 45 400 1560	 Wire outside diameter ≤ 1.5 mm	

har-port coupler

har-port RJ45 coupler

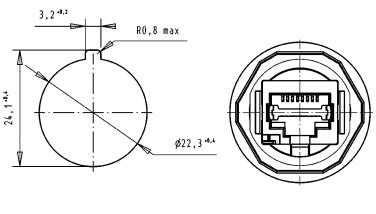
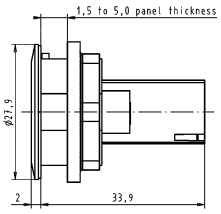
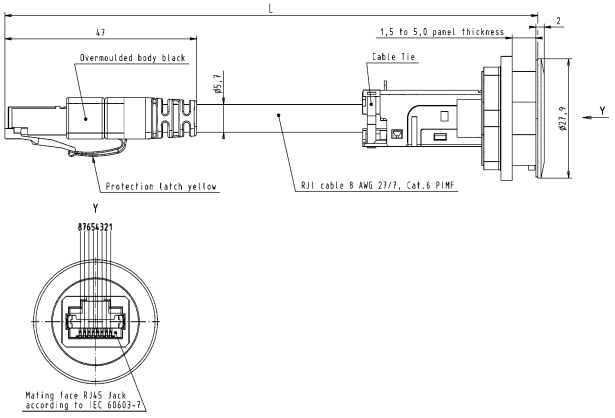
Advantages

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

Technical characteristics

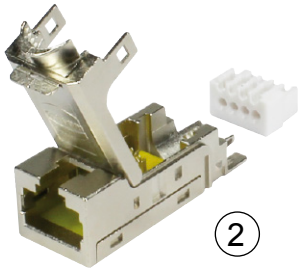
Number of ports	2x RJ45
Transmission performance	Category 6_A / Class E_A acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Mounting	Screwable in cover plates
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	-25 °C … +70 °C
Housing material	Polyamide

Connecting hardware

Identification	Part number silver	Part number black	Drawing	Dimensions in mm
har-port RJ45 Cat. 6 coupler	09 45 452 1560	09 45 452 1561		
har-port RJ45 Cat. 6 coupler with cable				
Length: 0.15 m	09 45 452 1500	09 45 452 1530		
0.2 m	09 45 452 1501	09 45 452 1531		
0.3 m	09 45 452 1502	09 45 452 1532		
0.5 m	09 45 452 1504	09 45 452 1534		
0.7 m	09 45 452 1506	09 45 452 1536		
1.0 m	09 45 452 1509	09 45 452 1539		
1.5 m	09 45 452 1510	09 45 452 1540		
2.0 m	09 45 452 1511	09 45 452 1541		
2.5 m	09 45 452 1512	09 45 452 1542		
3.0 m	09 45 452 1513	09 45 452 1543		
3.5 m	09 45 452 1514	09 45 452 1544		
4.0 m	09 45 452 1515	09 45 452 1545		
5.0 m	09 45 452 1516	09 45 452 1546		
7.5 m	09 45 452 1517	09 45 452 1547		
10.0 m	09 45 452 1518	09 45 452 1548		

har-port coupler

1



2

har-port RJ45 coupler

Advantages

• Type / Material	RJ45
• Category	5 / 6_A
• Number of contacts	4 / 8
• Termination	IDC
• Cable diameter	5 - 9 mm

Application

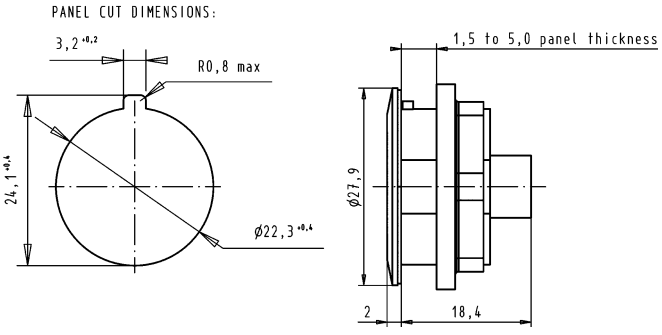
- For an easy access at devices, control cabinets or other distributors
- For diagnostic, maintenance and process data monitoring

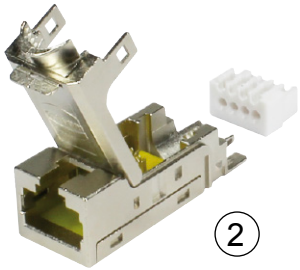
Benefits

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

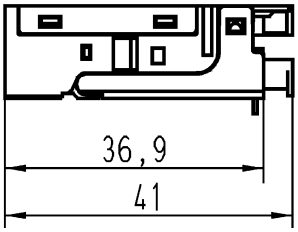
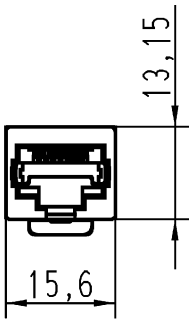
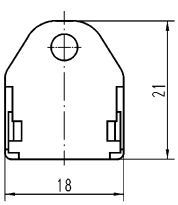
Technical characteristics

Connector type	RJ45
Number of contacts	4 / 8
Transmission performance	Category 5 / 6_A Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s 1/ 10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Cable termination	tool-less with IDC contacts
Conductor cross section stranded / solid	
Cable outer diameter	6 mm – 9 mm
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	Polyamide

Identification	Part number	Drawing	Dimensions in mm
har-port panel feed-throughs (1) to build-up customer-specific Ethernet interfaces silver black stainless steel	09 45 452 0000 09 45 452 0001 09 45 452 0002		



har-port RJ45 coupler

Identification	Part number	Drawing	Dimensions in mm
RJ45 female inserts ②			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1120		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 28-24 solid and stranded	09 45 545 1561		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1562		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 solid and stranded	20 82 001 0001		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 27/26 solid and stranded	20 82 001 0002		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001 / 20 82 000 0003)	20 82 000 0002		
preLink® terminal module gelb für AWG 23/22 solid and stranded	20 82 000 0001		
preLink® terminal module weiß für AWG 27/26 solid and stranded	20 82 000 0003		
Accessories			
Unlocking tool for opening of the jacks	20 82 000 9916		
preLink® assembly tool	20 82 000 9901		

har-port coupler

har-port USB coupler

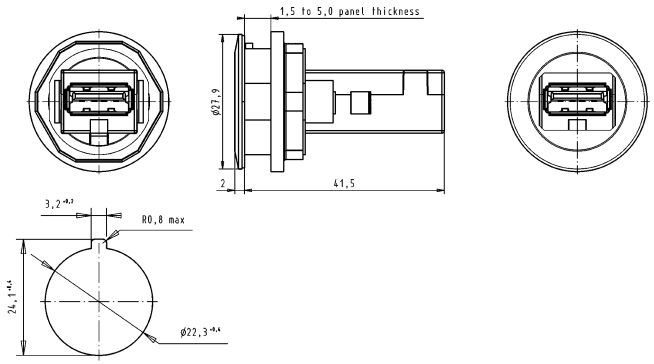
Advantages

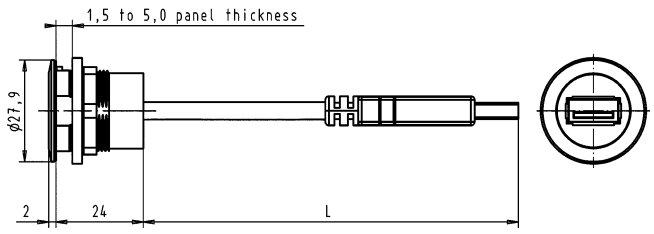
- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Compact and robust design
- Practical accessories

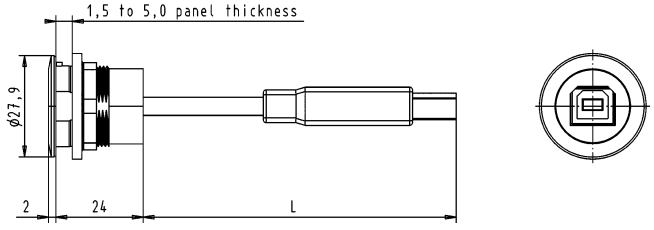
Technical characteristics

Mounting	Screwable in cover plates (thread M22 x 1)
Degree of protection	IP20
Mating cycles	min. 1500
Temperature range	-25 °C … +70 °C
Housing material	Polyamide

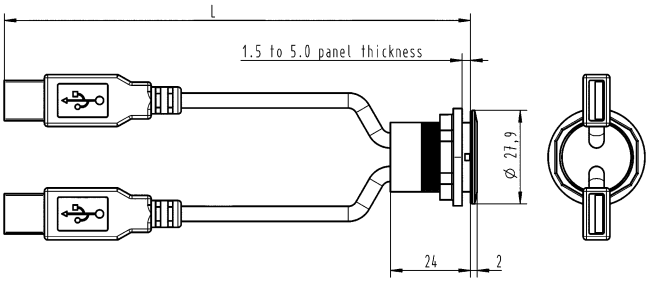
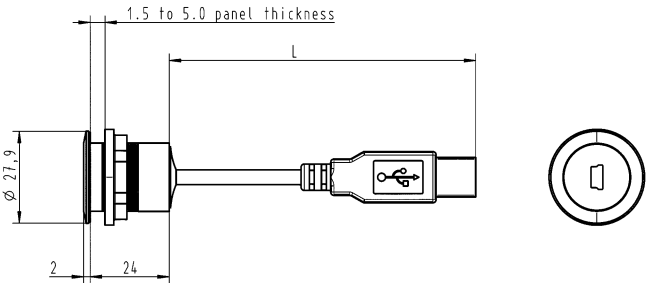
Identification	Part number silver	Part number black	Drawing	Dimensions in mm
***har*-port USB 2.0 coupler**				
Type A jack – Type A jack	09 45 452 1901	09 45 452 1903		
***har*-port USB 3.0 coupler**				
Type A jack – Type A jack	09 45 452 1902	09 45 452 1904		
***har*-port USB 2.0 coupler with cable**				
Type A jack – Type A connector				
Length: 0.15 m	09 45 452 1927			
0.4 m	09 45 452 1928			
0.5 m	09 45 452 1920	09 45 452 1960		
1.0 m	09 45 452 1921	09 45 452 1961		
1.5 m	09 45 452 1922	09 45 452 1962		
2.0 m	09 45 452 1923	09 45 452 1963		
3.0 m	09 45 452 1924	09 45 452 1964		
4.0 m	09 45 452 1926			
5.0 m	09 45 452 1925	09 45 452 1965		
Type B jack – Type B connector				
Length: 0.5 m	09 45 452 1910			
1.0 m	09 45 452 1911			
1.5 m	09 45 452 1912			
2.0 m	09 45 452 1913			
3.0 m	09 45 452 1914			
5.0 m	09 45 452 1915			



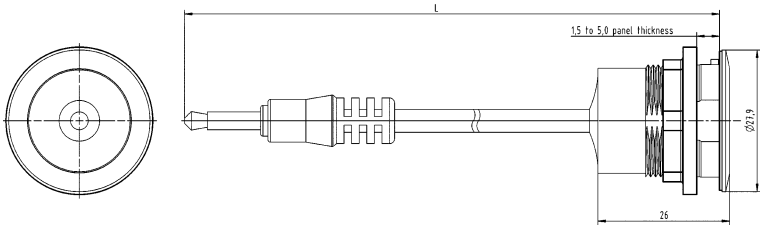
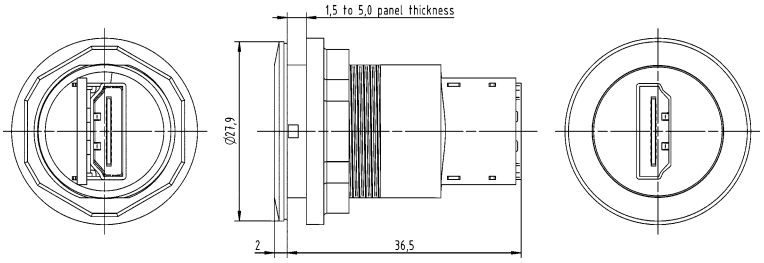




har-port USB coupler

Identification	Part number silver	Part number black	Drawing	Dimensions in mm
***har*-port USB 2.0 coupler**				
2 x Type A jack – Type A connector				
Length: 0.5 m	09 45 452 1950			
1.0 m	09 45 452 1951			
1.5 m	09 45 452 1952			
2.0 m	09 45 452 1953			
3.0 m	09 45 452 1954			
5.0 m	09 45 452 1955			
***har*-port USB 3.0 coupler**				
Type A jack – Type A connector				
Length: 0.5 m	09 45 452 1930	09 45 452 1970		
1.0 m	09 45 452 1931	09 45 452 1971		
1.5 m	09 45 452 1932	09 45 452 1972		
2.0 m	09 45 452 1933	09 45 452 1973		
3.0 m	09 45 452 1934	09 45 452 1974		
***har*-port USB 2.0 coupler**				
Type Mini-B jack – Type A connector				
Length: 0.5 m	09 45 452 1940			

har-port RJ45 coupler

Identification	Part number silver	Drawing	Dimensions in mm
***har*-port audio interface 3.5 mm** stereo phone jack jack to connector			
Length: 1.0 m	09 45 452 1000		
2.0 m	09 45 452 1001		
HDMI video interface	09 45 452 1010		

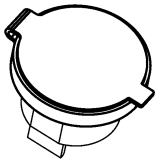
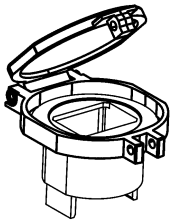
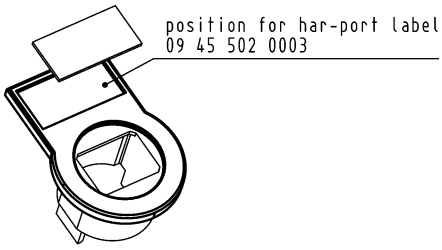
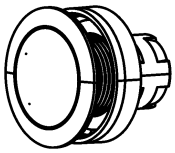
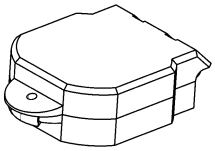
har-port accessories

Advantages

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

Technical characteristics

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

Identification	Part number	Drawing	Dimensions in mm
Accessories			
har-port protection cover IP65/IP67 black	09 45 502 0000		
har-port sealing cover IP40	09 45 502 0001		
har-port label holder	09 45 502 0002		
har-port label for label holder 09 45 502 0002	09 45 502 0003		
har-port blind cover IP65/IP67	09 45 502 0004		
har-port protection cover IP65/IP67 transparent	09 45 502 0005		
har-port protection cover IP65/IP67 metal	09 45 502 0006		

Directory Chapter 04

Notes

HARTING connection technology for the food industry

The food industry relies on modern processing, portioning and packaging equipment. The controls (and therefore the associated Ethernet cable) hardly differ from those used in the machinery construction sector. However, all components that come into contact with food or are mounted at preparation sites are subject to special hygiene and cleaning regulations.

Thus, it is necessary to use compatible materials and also avoid any increased adhesion of dirt or bacteria.

HARTING uses only materials that comply with FDA 21 in our Han® F+B product series.

All facility and cabling components must also be rigorously and continuously cleaned. This results in additional, tougher demands on the cabling components compared to general industry requirements.

These include a higher degree of IPx protection and higher temperature requirements – so that long-term exposure to high-pressure steam cleaners causes no malfunction or damage. Therefore, HARTING products in the Han® F+B series are designed with IP69K protection for a wide temperature range.

The Han® F+B series follows the “Easy to Clean” design in accordance with ISO 14 159 and DIN EN 1672-2. It is also certified according to the Ecolab Directive.

Currently, the Han® F+B portfolio for Ethernet cabling includes:

- RJ45 connectors for Fast Ethernet in Category 5
- RJ45 connectors for Gigabit Ethernet in Category 6_A
- Matching protective housings with Han® 3 A design (according to IEC 61 076-3-106, variant 5)
- Connector housings based on M25 with the corresponding cable glands
- Accessories

Han® F + B connectors

① ② ③ ④

Han® F+B Ethernet connector for food industry

Features

• Connector type	RJ45
• Category	5 / 6 / 6_A
• Number of contacts	4 or 8

Application

- Machines for food industry
- Bottling plants
- Packaging machines
- Application areas
  - Interface inside the splash zone
  - Connections with chemical resistance and high cleaning cycles

Benefits

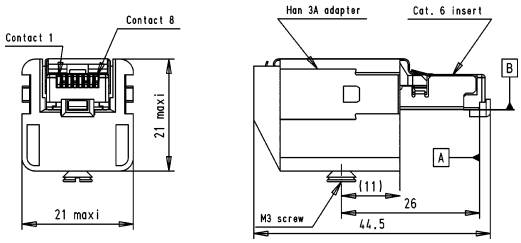
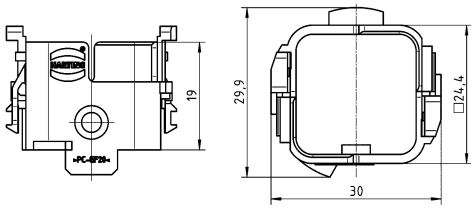
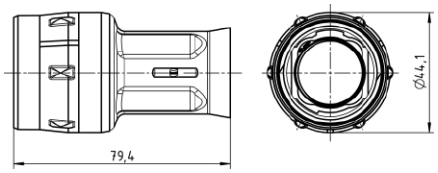
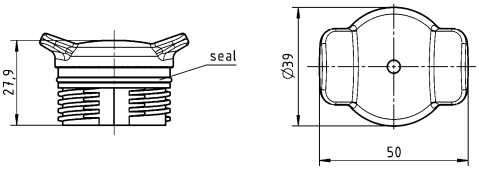
- Degree of protection IP69K
- Resistant against cold and heat
- Certified acc. to Ecolab
- „Easy to Clean" design acc. to ISO 14 159 and DIN EN 1672-2
- Materials acc. to FDA 21

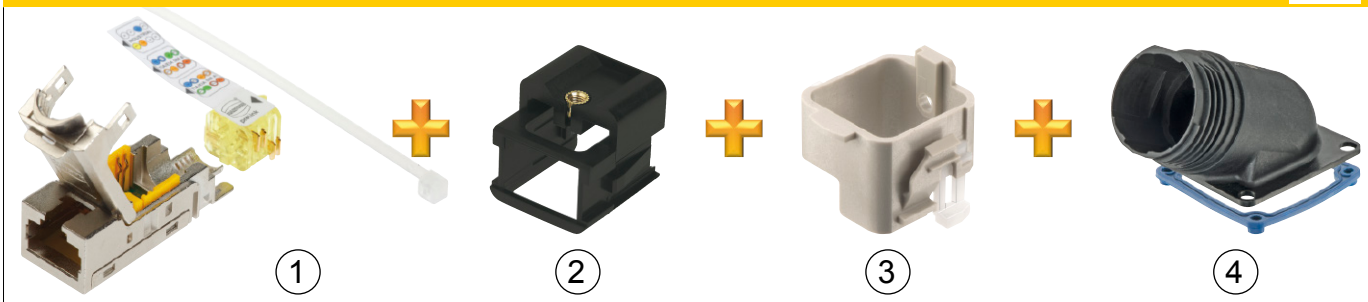
Technical characteristics

Connector type	RJ45 acc. to IEC 61 076-3-106 variant 5
Number of contacts	4
Transmission performance	Category 5 / Class D up to 100 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Number of contacts	8
Transmission performance	Category 6_A / Class E_A up to 500 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Housing	
Housing material	PP
Sealing material outside	EPDM / TPE
Limiting temperature	-40 °C … +125 °C
Degree of protection acc. to DIN EN 60 529 if mated	IP67 / IP69K
Housing locking	Screw locking
Materials and resistances	
Housing materials with FDA 21 approval	
Ecolab® tested	P3-topax 52 P3-topax 19 P3-topax 66 P3-topax 99 P3-topax 56 P3-topax 200
Acigel, Supergel, Tego 2000	

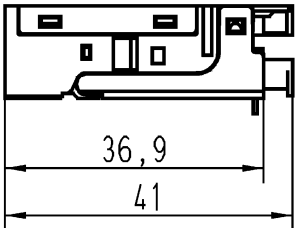
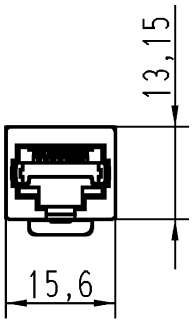
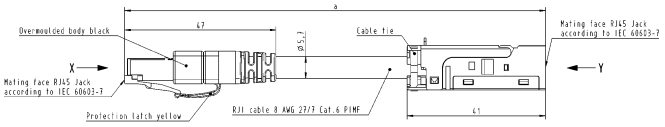
Han® F+B connectors

Han® F+B Ethernet connector for food industry

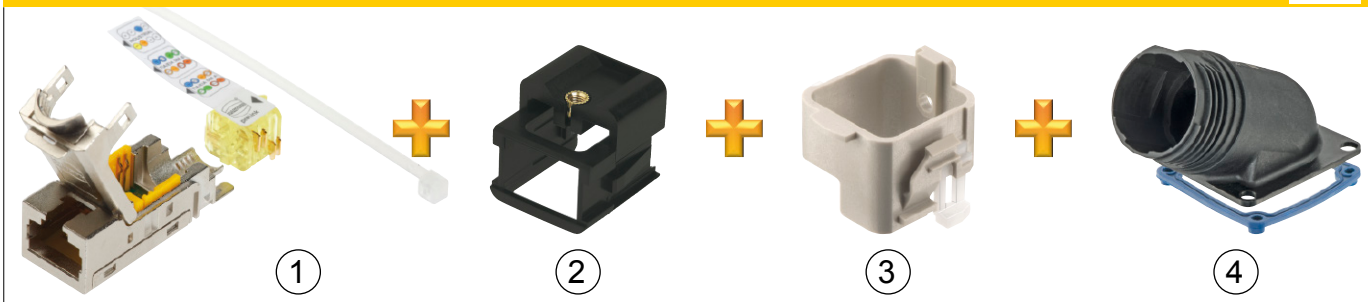
Identification		Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 connector inserts	1			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded		09 45 100 1100		
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 26-24 solid and stranded		09 45 100 1110		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 27-22 solid and stranded		09 45 100 1560		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s piercing termination for AWG 28-26 stranded		09 45 100 1520		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003)		20 82 002 0001		
Han® F+B adapter for Han® 3 A inserts	2	09 15 503 9911		
Han® F+B connector housing M25	3	19 15 503 1401		
Han® F+B cable glands M25 cable glands plastic	4			
Sealing range 5 – 9 mm		19 00 000 5189		
Sealing range 9 – 16 mm		19 00 000 5191		
Sealing range 13 – 18 mm		19 00 000 5193		
Needed lock cover (to avoid dirtness areas at the cable gland)				
1.2 mm thickness		09 15 500 9912		
2.5 mm thickness		09 15 500 9911		
Accessories				
Protection cap for Han® F+B connector housing 		09 15 503 5411		



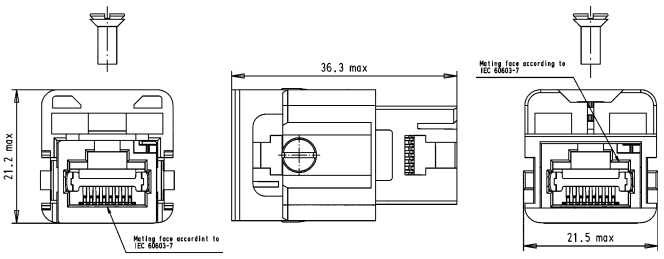
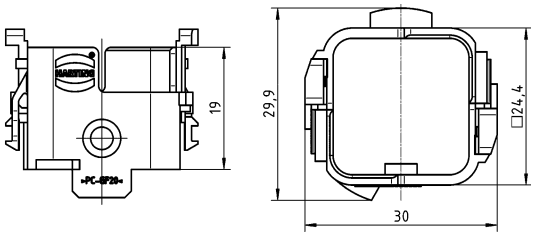
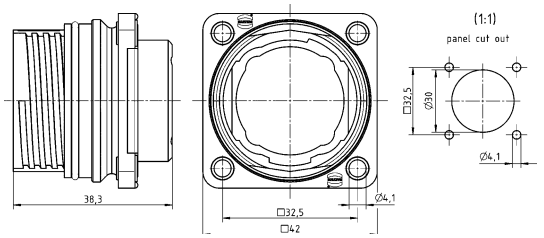
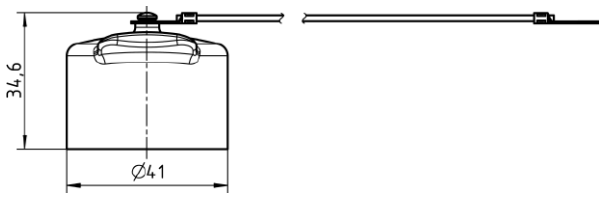
Han® F+B Ethernet panel feed-throughs for food industry

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A RJ45 female inserts ①			
Cat. 5, 4 poles, 10/100 Mbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1120		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 28-24 solid and stranded	09 45 545 1561		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s IDC for AWG 24-22 solid and stranded	09 45 545 1562		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC für AWG 23/22 solid and stranded	20 82 001 0001		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC für AWG 27/26 solid and stranded	20 82 001 0002		
Cat. 6_A, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s preLink® IDC for AWG 23/22 or AWG 27/26 depending on the separately orderable preLink® terminal module (20 82 000 0001/20 82 000 0003)	20 82 000 0002		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s RJ45 system cable jack on connector			
0.15 m	09 45 545 1500		
…	…		
10.00 m	09 45 545 1518		
Cat. 6, 8 poles, 10/100 Mbit/s and 1/10 Gbit/s RJ45 coupler with Han® 3 A adapter 	09 45 200 1560		

Han® F + B connectors



Han® F+B Ethernet panel feed-throughs for food industry

Identification	Part number	Drawing	Dimensions in mm
Han® 3 A adapter for HIFF inserts (2)	09 45 515 0024		
Han® F+B adapter for Han® 3 A inserts (3)	09 15 503 9911		
Han® F+B Housing bulkhead mounting (4)			
Straight type 	09 15 503 0301		
Angled type 	09 15 503 0901		
Housing cable-to-cable	09 15 503 1701		
Accessories			
Protection cap for Han® F+B Housing bulkhead mounting 	09 15 503 5401		

Notes

Directory Chapter 05

Notes

HARTING cables and connection technology for railway

Manufacturers and suppliers of railway vehicles as well as railway operators have relied on HARTING products for many years. This has resulted in very productive cooperation on several levels. The extremely robust and durable Han® connectors are now practically the standard used for almost all locomotives, railcars and long-haul and regional trains worldwide.

HARTING's range of solutions and products for these applications is very broad. This cabling catalogue, therefore, presents only the specific data networking components for Ethernet, WTB and MVB cabling (MVB = Multifunction Vehicle Bus, WTB = Wire Train Bus; both bus systems are still widely in use but are increasingly being replaced by Ethernet).

Specifically, these are:

- HARTING EtherRAIL® data cables (Category 5) for Fast Ethernet (100 Mbit/s), for installations in and on trains
- M12 D-coded connectors (IP65 / IP67) and RJ45 (IP20)
- HARTING EtherRAIL® data cables (Category 5) for Fast Ethernet (100 Mbit/s), for installations between railcars (very flexible)
- HARTING connectivity: Han Quintax® and Han® MegaBit modules specifically for railcar couplings
- HARTING EtherRAIL® data cables (Category 7) for Gigabit Ethernet and 10 GB, for installations in, on and between railcars
- har-speed M12 X-coded connectors (IP65 / IP67) for Gigabit Ethernet and 10 GB, installed in and on the train
- HARTING connectivity: Han Quintax® High Density and Han® GigaBit modules specifically for railcar couplings
- HARTING MVB and WTB bus cable
- HARTING D-Sub InduCom connection technology

All of these HARTING products are designed, manufactured and certified in accordance with the specific requirements of the railway sector.

These requirements are:

- Extremely high demands for vibration resistance (contact reliability, plug-in security, etc.)
- Above-average service life (e.g. 30 years or longer)
- High transmission reliability for all operating modes of the train (shielding, EMC safety)
- Extremely high temperature range (e.g. from -40 °C to +90 °C)
- Demanding safety requirements in case of fire (extensive fire tests in compliance with international, European, national and even company-specific regulations)

There are very few pre-assembled system cables listed in this catalogue. This is because the requirements mentioned above and the associated product tests lead to specific requirements for length, labelling and packaging that rule out standard products.

HARTING HCS (http://www.harting-customised-solutions.com/en/home/) provides customised solutions in the railway sector.

HARTING Ethernet cabling – M12 cords D-coding

HARTING M12
system cable, 4-wire, straight

Features

- Connector types: M12 D-coding
- Category: Cat. 5
- Number of wires: 4
- Wiring: 1:1
- Sheath material: PE

Application

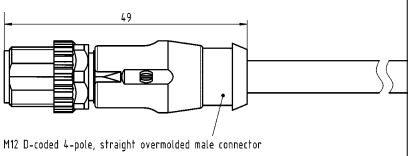
- For harsh industrial environments
- Pre-assembled on both sides

Benefits

- Robust design
- Use on-site made possible by IP65/IP67 protection

Technical characteristics

Connector types	1x HARTING M12 D-coding, overmoulded, second side open
Sheath material	PE
Wiring	4 pole, 1:1
Transmission performance	Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C … +85 °C
Colour	Black

Identification	Part number PE	PE ultra flexible	Drawing	Dimensions in mm
HARTING M12 system cable, 4-wire	Black	Black		
Length 1.0 m	21 34 220 0011 010	21 34 220 0012 010		
1.5 m	21 34 220 0011 015	21 34 220 0012 015		
3.0 m	21 34 220 0011 030	21 34 220 0012 030		
5.0 m	21 34 220 0011 050	21 34 220 0012 050		
7.5 m	21 34 220 0011 075	21 34 220 0012 075		
10.0 m	21 34 220 0011 100	21 34 220 0012 100		
20.0 m	21 34 220 0011 200	21 34 220 0012 200		

Other cable lengths on request

Ha-VIS EtherRail®
stranded cable, Cat. 5e, 4-wire

Features

- Sheath material: Elastomer, electron beam cross-linked
- Category: 5
- Number of wires: 4
- Wire design: AWG 22/7
- Wire diameter: (6.6 ± 0.2) mm

Application

- For installation within and outside rail vehicles

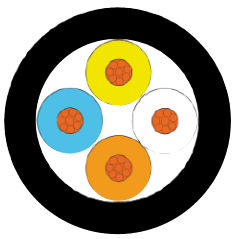
Benefits

- Robust design
- Fire protection acc. to EN 45545-1, -2 and -5
- Flame-retardant and heat resistant acc. to DIN 5510 (1-4) and EN 50264-1
- UV protected
- RoHS compliant
- Halogen free
- Small Ø permits RJ45 assembly

Technical characteristics

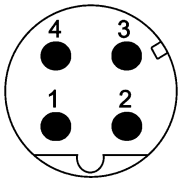
Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/7, tinned copper wire, stranded
Wire insulation	PE-Foam Skin, Ø 1.5 mm
Sheath material	Elastomer, electron beam cross-linked
Cable sheath diameter	6.6 ±0.2 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C … +90 °C
Standard lengths	100 m / 500 m / 1000 m
Colour	Black or blue
Tests / Certificats	Tests and certificates acc. to DIN, N FF, BS and ASTM, detail information see Technical Data sheet

Identification	Part number Elastomer		Drawing	Dimensions in mm
Ha-VIS EtherRail® stranded cable, Cat. 5e 4-wire	Black	Blue		
10 m ring	09 45 600 0168	09 45 600 1400		
50 m ring	09 45 600 0178	09 45 600 1410		
100 m ring	09 45 600 0108	09 45 600 1420		
500 m drum	09 45 600 0118	09 45 600 1430		
1000 m drum	09 45 600 0128	09 45 600 1440		



M12 connectors D-coding

Mating face



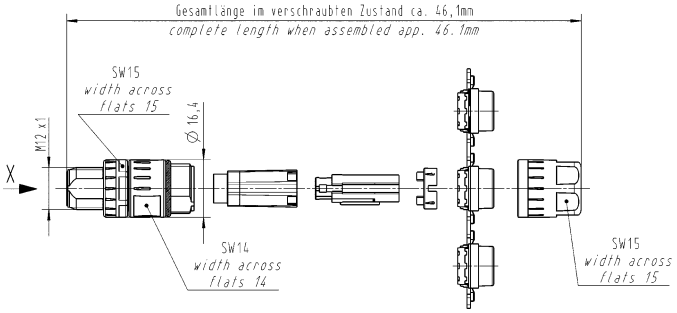
D-coding
Mating face
acc. to IEC 61076-2-101

Identification	Part number	Drawing	Dimensions in mm

M12 Crimp Slim design, shielded

Male
4 poles, D-coding
Cable: 5.7 - 8.8 mm
outer diameter

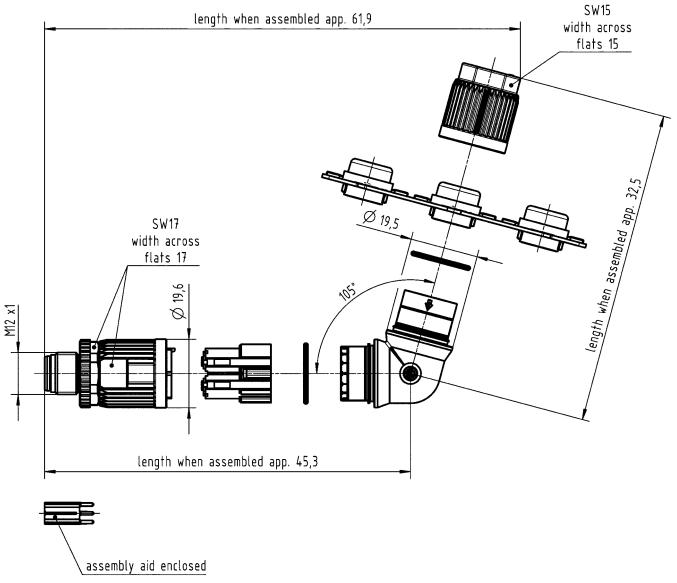
21 03 881 1405*



M12 Crimp, shielded

Male
4 poles, D-coding
angled

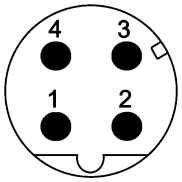
21 03 882 3405*



Further information and data sheets see www.HARTING.com
* UL approval is in preparation

M12 connectors D-coding

Mating face

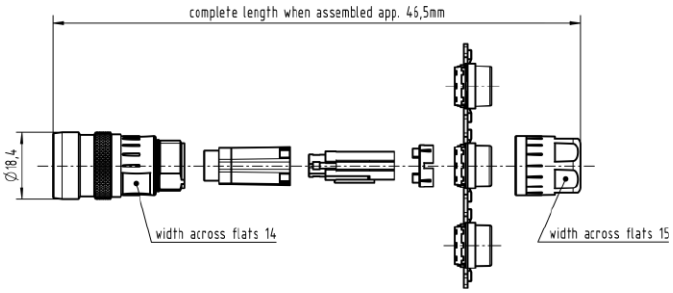


D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

Applications / Advantages

- M12 PushPull for a fast and vibration-free connection
- Simple assembly without tools
- You can hear it click into place
- Suitable for signal and data transmission

Identification	Part number	Drawing	Dimensions in mm
M12 PushPull Slim design  Male straight version 4 poles, D-coding, IP54 Cable diameter: 5.7 - 8.8 mm	21 03 881 1430		

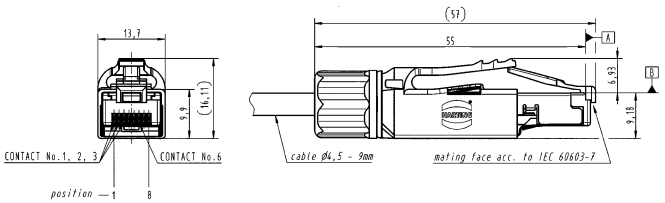
HARTING RJ Industrial® EtherRail® RJ45 connector set, 4 poles

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 5e
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Optimized version for Ha-VIS EtherRail® Ethernet cable, Shielded Star Quad Cable, AWG 22/19 ultra-flexible, acc. Cat. 5e cabling standard (ISO / IEC 11 801), part numbers 09 45 600 0188, 09 45 600 0138, 09 45 600 0148 and 09 45 600 0158

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	4
Transmission category	Category 5e, Class D
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO / IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 … AWG 22 (solid / stranded)
- Conductor diameter	max. 2 mm (incl. insulation)
- Cable diameter	4.5 … 9 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C … +70 °C
Housing material	Polyamide, UL 94-V0
Colour	black

Identification	Part No.	Drawing	Dimensions in mm
HARTING RJ Industrial® EtherRail® RJ45 connector set, 4 poles			
straight version	09 45 151 1122		

Identification	Colour	Part No.
Colour clips for colour coding the HARTING RJ Industrial® EtherRail® RJ45 connector If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.	White	09 45 850 0001
	Grey	09 45 850 0002
	Yellow	09 45 850 0003
	Magenta	09 45 850 0005
	Red	09 45 850 0007
	Blue	09 45 850 0008
	Green	09 45 850 0009
	Brown	09 45 850 0010

HARTING Ethernet cabling – cables and connectors, 4 wire

Ha-VIS EtherRail®
ultra flexible cable, Cat. 5e, 4-wire

Features

- Sheath material: Elastomer, electron beam cross-linked
- Category: 5
- Number of wires: 4
- Wire design: AWG 22/19
- Wire diameter: (7.4 ± 0.1) mm

Application

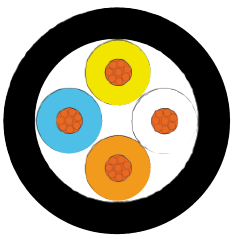
- For installation within and outside rail vehicles and especially between coaches

Benefits

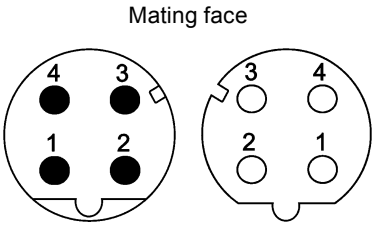
- Robust design, especially suitable between coaches
- Fire protection acc. to EN 45545-1, -2 and -5
- Flame-retardant and heat resistant acc. to DIN 5510 (1-4) and EN 50264-1
- UV protected
- RoHS compliant
- Halogen free

Technical characteristics

Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/19, tinned copper wire, ultra flexible
Wire insulation	PE, Ø 1.98 mm
Sheath material	Elastomer, electron beam cross-linked
Cable sheath diameter	7.4 ± 1 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11801:2002, EN 50173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C … +90 °C
Standard lengths	100 m / 500 m / 1000 m
Colour	Black
Tests / Certificats	Tests and certificats acc. to DIN, N FF, BS and ASTM, detail information see Technical Data sheet

Identification	Part number Elastomer	Drawing	Dimensions in mm
Ha-VIS EtherRail® ultra flexible cable, Cat. 5e 4-wire	Black		
10 m ring	09 45 600 0188		
50 m ring	09 45 600 0189		
100 m ring	09 45 600 0138		
500 m drum	09 45 600 0148		
1000 m drum	09 45 600 0158		

M12 connectors D-coding

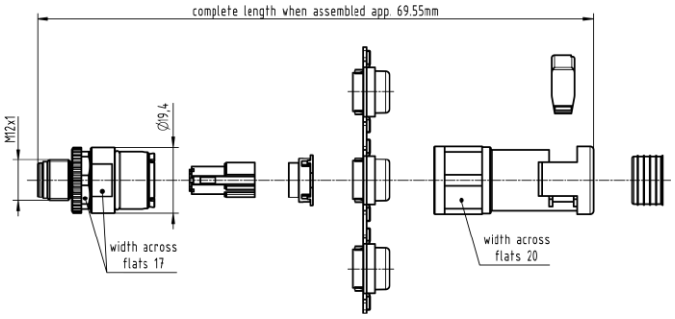
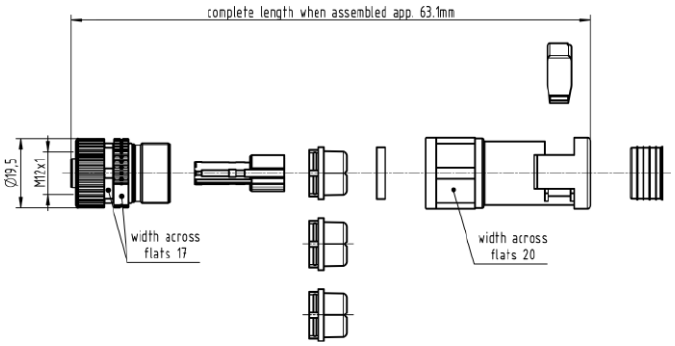


D-coding
Mating face
acc. to IEC 61076-2-101

RoHS

Applications / Advantages

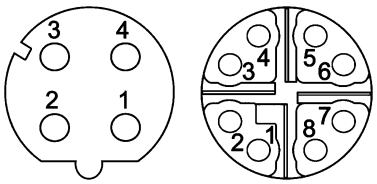
- M12 connector with the option to connect a plastic tube to protect the cable assembly in rough applications
- Robust design for IP65 / IP67 environments
- A- and D-coding available with crimp termination
- 360° shielding

Identification	Part number	Drawing	Dimensions in mm
M12 connector with PMA connection for PVC tube NW10  Male 4 poles, D-coding	21 03 882 1411		
M12 connector with PMA connection for PVC tube NW10  Female 4 poles, D-coding	21 03 882 2411		

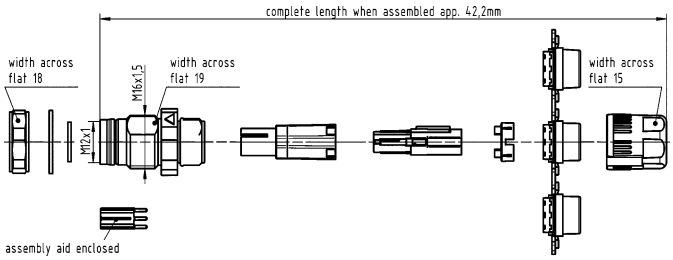
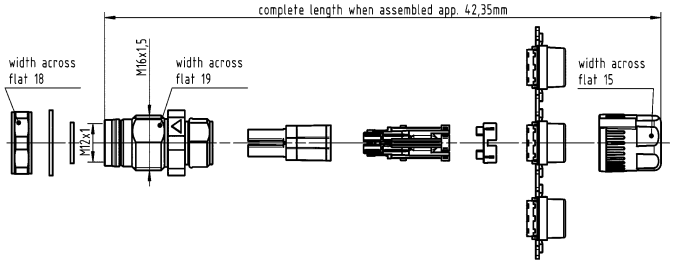
We recommend to use the PMA tube PCST-10B.50 that is available at the PMA company.

M12 connectors D-coding

Mating face



D-coding
Mating face
acc. to IEC 61076-2-101

Identification	Part number	Drawing	Dimensions in mm
M12 PFT Slim Design  Female 4 poles, D-coding	21 03 881 2425		
M12 PFT Slim Design  Female 8 poles, X-coding 0.08 - 0.25 mm² AWG 28 - 23	21 03 881 2825		

Features

- Shielding bus separate from housing potential
- Suitable for the transmission of sensitive signals (e.g. bus signals)
- The four pole Han® Quintax contact is suitable for Ethernet Cat. 5e and PROFIBUS when diagonally wiring of the data pairs

Specifications / Approvals

IEC 60664-1
IEC 61984

Technical characteristics

Contacts	2
Electrical data acc. to IEC 61984	**10 A 50 V 0.8 kV 3**
Rated current	10 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ohm
Limiting temperatures	-40 °C … 85 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate, zinc alloy
Colour (insert)	RAL 7032 (light grey)
Material (contact)	copper alloy
Material (accessories)	metal

Details

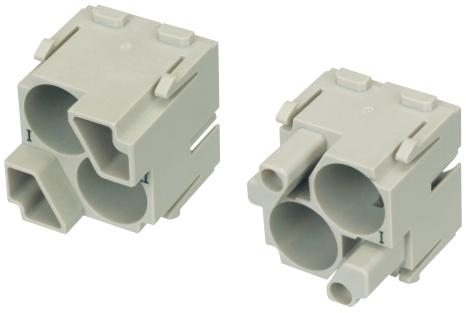
Remarks on the crimp technique

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

Han-Quintax® module

Number of contacts

2



Identification	Wire gauge (mm²)	Part number male	Part number female	Drawing	Dimensions in mm
Han-Modular®, Han-Quintax® module Crimp terminal		09 14 002 3001	09 14 002 3101	M F	Contact arrangement (view from termination side)
Han D® Crimp contact, gold plated contacts, contact resistance ≤ 3 mOhm	0.14-0.37 0.5 0.75 1 1.5 2.5	09 15 000 6124 09 15 000 6123 09 15 000 6125 09 15 000 6122 09 15 000 6121 09 15 000 6126	09 15 000 6224 09 15 000 6223 09 15 000 6225 09 15 000 6222 09 15 000 6221 09 15 000 6226		
Han-Quintax® contact 4 + shielding, for Han D® crimp contacts Please order crimp contacts separately		09 15 004 3013	09 15 004 3113	M F	
Han-Quintax® Adapter optional		09 14 000 9915	09 14 000 9915		

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

Han® MegaBit module

Features

- Shielding bus separate from housing potential
- Suitable for Fast Ethernet 100 Mbit/s (1x4) or Gigabit Ethernet 1000 Mbit/s (2x4) Cat. 5e. By the connection of two 4-wire EtherRail® cables (4 x AWG 22/19 resp. 4 x AWG 22/7) the transmission of Gigabit Ethernet is possible.
- Suitable for Han® B, Han® M, Han® EMC and Han® HPR hoods/housings, high construction

Specifications / Approvals

DIN EN 60664-1
DIN EN 61984

Technical characteristics

Contacts	2
Electrical data acc. to IEC 61984	**10 A 50 V 0.8 kV 3**
Rated current	10 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ohm
Limiting temperatures	-40 °C … 125 °C -40 °C … 85 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate
Colour (insert)	RAL 7032 (light grey)
Material (contact)	copper alloy
Material (shielding element)	zinc die-cast alloy
Material (outer conductor)	zinc alloy
Surface (outer conductor)	nickel plated contacts

Details

Remarks on the crimp technique

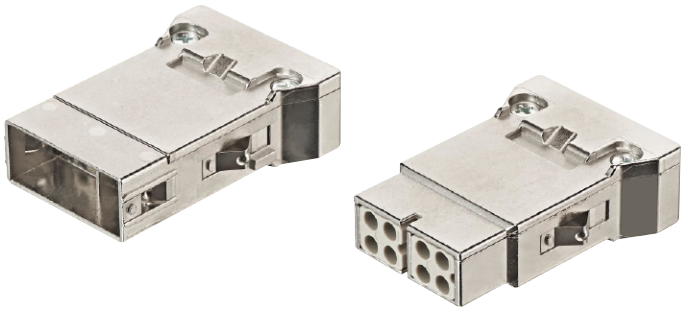
The wire gauges mentioned in the catalogue refer to geometric wire gauges of cables.

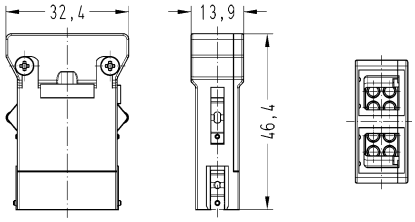
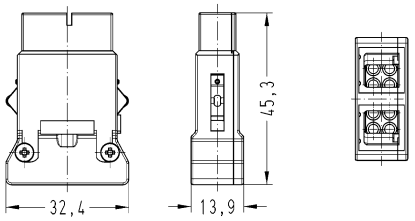
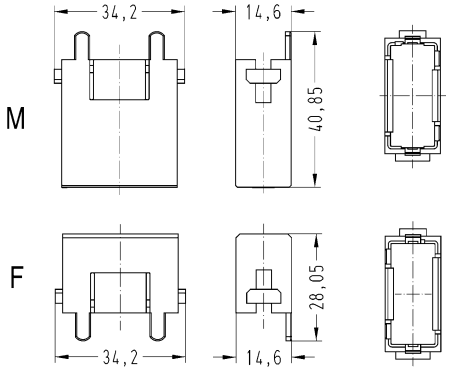
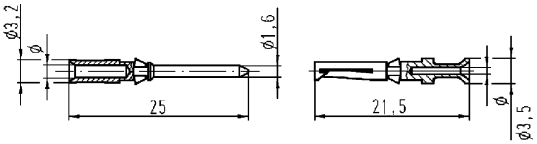
Han® MegaBit module

Number of contacts

2 x 4

50 V
10 A



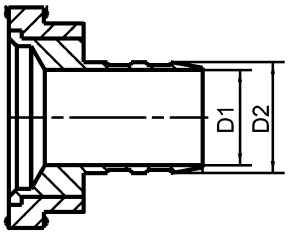
Identification	Wire gauge (mm²)	Part number male	Part number female	Drawing	Dimensions in mm
Han-Modular®, Han® Megabit Insert Crimp terminal Please order crimp contacts separately Please order the adapter module separately		09 14 008 3016	09 14 008 3116		
Han-Modular®, Han® Megabit Insert Crimp terminal, with additional shield connection to the hinged frame Please order crimp contacts separately Please order the adapter module separately		09 14 008 3017	09 14 008 3117		
Han-Modular®, Adapter module		09 14 001 3011	09 14 001 3111		
Han D® Crimp contact, gold plated contacts, contact resistance ≤ 3 mOhm	0.14-0.37 0.5 0.75 1 1.5 2.5	09 15 000 6124 09 15 000 6123 09 15 000 6125 09 15 000 6122 09 15 000 6121 09 15 000 6126	09 15 000 6224 09 15 000 6223 09 15 000 6225 09 15 000 6222 09 15 000 6221 09 15 000 6226		

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

Accessories for Han® MegaBit

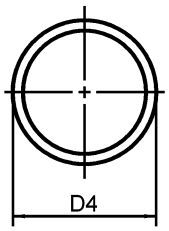
Identification	D1	D2	Part number	Drawing	Dimensions in mm
Crimp flange	3 mm	4 mm	61 03 000 0062		
	4 mm	5 mm	61 03 000 0064		
	5 mm	6 mm	61 03 000 0066		
	6 mm	7 mm	61 03 000 0067		
	7 mm	8 mm	61 03 000 0069		
	8 mm	9 mm	61 03 000 0071		
	9 mm	10 mm	61 03 000 0072		
	3.5 mm	4 mm	61 03 000 0063		
	4.5 mm	5.5 mm	61 03 000 0065		
	5.5 mm	6.5 mm	61 03 000 0166		
	6.5 mm	7.5 mm	61 03 000 0068		
	7.5 mm	8.5 mm	61 03 000 0070		
	18.5 mm	19.5 mm	61 03 000 0165		

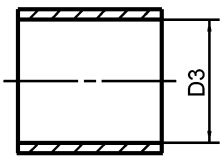
HARTING offers to test and define the best crimp flange and ferrule combination for customer-specific cables.



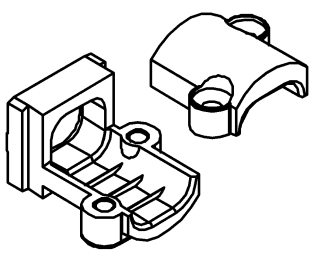
Identification	D3	D4	Part number	Drawing	Dimensions in mm
Crimp ferrule	5 mm	6 mm	61 03 000 0045		
	6 mm	7 mm	61 03 000 0047		
	7 mm	8 mm	61 03 000 0049		
	8 mm	9 mm	61 03 000 0051		
	9 mm	10 mm	61 03 000 0053		
	10 mm	11 mm	61 03 000 0055		
	11 mm	12 mm	61 03 000 0057		
	12 mm	13 mm	61 03 000 0142		
	13 mm	14 mm	61 03 000 0127		
	5.5 mm	6.5 mm	61 03 000 0046		
	6.5 mm	7.5 mm	61 03 000 0048		
	7.5 mm	8.5 mm	61 03 000 0050		
	8.5 mm	9.5 mm	61 03 000 0052		
	9.5 mm	10.5 mm	61 03 000 0054		
	10.5 mm	11.5 mm	61 03 000 0056		
	11.5 mm	12.5 mm	61 03 000 0058		
	12.5 mm	13.5 mm	61 03 000 0059		

HARTING offers to test and define the best crimp flange and ferrule combination for customer-specific cables.

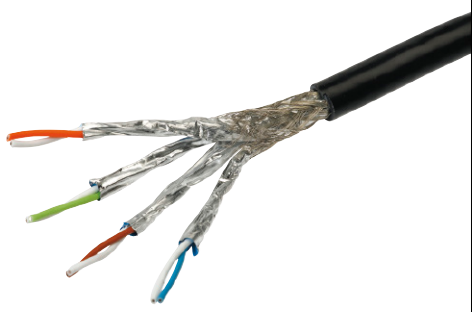




Cable clamp 5 … 7 mm			61 03 000 0141		
Cable clamp 7 … 10 mm			61 03 000 0044		
Cable clamp 10 … 12 mm			61 03 000 0143		



M12 system cable,
8-wire



Features

- Sheath material: Elastomer, electron beam cross-linked
- Category: 7
- Number of wires: 8
- Wire design: AWG 24/7
- Wire diameter: (8.1 ± 0.2) mm

Application

- For installation within and outside rail vehicles and buses

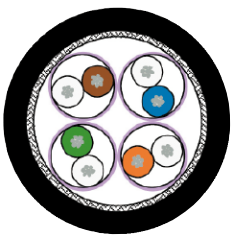
Benefits

- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- For installation within and outside rail vehicles and buses
- Fire protection acc. EN 45545-1, -2 and -5, flame retardant and heat resistant acc. DIN 5510 (1-4) and EN 50264-1
- UV resistant, RoHS conform, halogen free LSZH
- Designed to be compatible with products from HARTING like *har*-speed M12 Crimp and Han® GigaBit module.

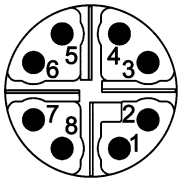
Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 24/7, tinned copper wire
Wire insulation	PE, Ø 1.55 mm
Sheath material	Elastomer, electron beam, cross-linked
Cable sheath diameter	(8.8 ± 0.2) mm
Transmission performance	Category 7 / Class D, E, E_A, F up to 600 MHz acc. to ISO/IEC 11801 and EN 50173-1
Transmission rate	1/10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-40 °C … +85 °C
Supply lengths	100 m / 500 m / 1000 m
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS EtherRail® flexible data cable, PIMF 4x2xAWG 24/7, Cat. 7			
10 m ring	09 45 600 0694		
50 m ring	09 45 600 0693		
100 m ring	09 45 600 0692		
500 m reel	09 45 600 0691		
1000 m reel	09 45 600 0690		



Mating face

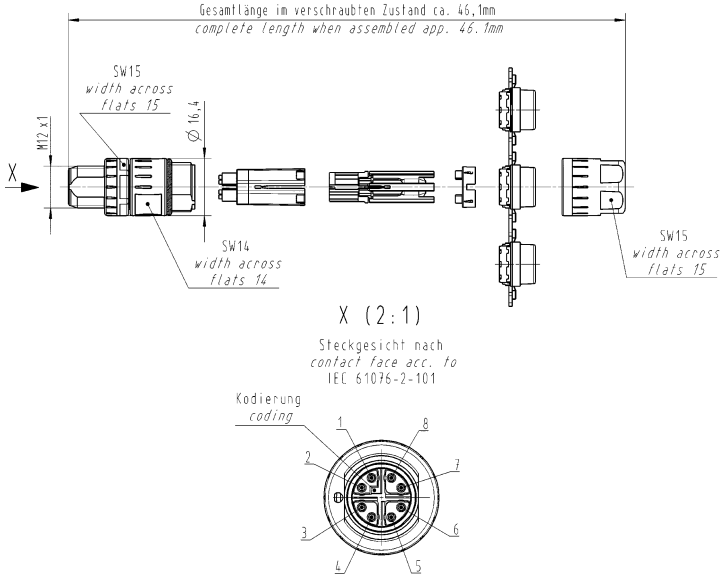


X-coding
Mating face
acc. to IEC 61076-2-109

RoHS

Applications / Advantages

- High-Speed Ethernet applications for process automatization, e.g. camera system for process control in the production
- Maxiumum data rates through the configuration of the contacts in conformance with Ethernet technology. Transfer class E_A for 1 and 10 Gigabit
- Wire termination by using crimp contacts
- Perfect shielding through paired shielding of the contacts
- Overmoulded system cables in various lengths

Identification	Part number	Drawing	Dimensions in mm
har-speed M12 Slim design  Male straight version 8 poles, Cat. 6_A Cable diameter: 5.7 - 8.8 mm	21 03 881 1805		

M12 system cable

Features

- Sheath material: Elastomer, electron beam cross-linked
- Category: 7
- Number of wires: 8
- Wire design: AWG 24/7
- Wire diameter: (8.1 ± 0.2) mm

Application

- For installation within and outside rail vehicles and buses

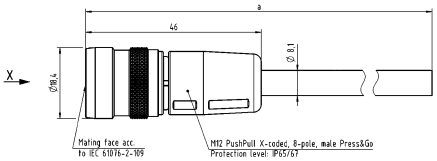
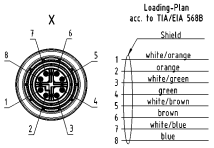
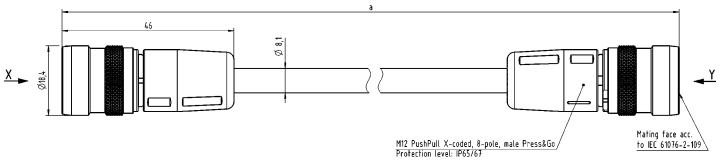
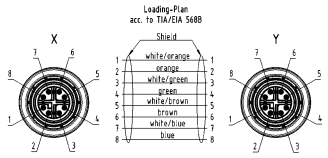
Benefits

- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- For installation within and outside rail vehicles and buses
- Fire protection acc. EN 45545-1, -2 and -5, flame retardant and heat resistant acc. DIN 5510 (1-4) and EN 50264-1
- UV resistant, RoHS conform, halogen free LSZH
- Designed to be compatible with products from HARTING like *har*-speed M12 Crimp and Han® GigaBit module.

Technical characteristics

Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 24/7, tinned copper wire
Wire insulation	PE, Ø 1.55 mm
Sheath material	Elastomer, electron beam, cross-linked
Cable sheath diameter	(8.8 ± 0.2) mm
Transmission performance	Category 7 / Class D, E, E_A, F up to 600 MHz acc. to ISO/IEC 11801 and EN 50173-1
Transmission rate	1/10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-40 °C … +85 °C
Supply lengths	100 m / 500 m / 1000 m
Colour	Black

har-speed M12 system cable, 8-wire

Identification		Part number PVC	Drawing	Dimensions in mm
M12 system cable, 8-wire				
one side assembled		Black		
Length	1.0 m	21 33 290 0853 010		
	1.5 m	21 33 290 0853 015		
	2.0 m	21 33 290 0853 020		
	3.0 m	21 33 290 0853 030		
	5.0 m	21 33 290 0853 050		
	7.5 m	21 33 290 0853 075		
	10.0 m	21 33 290 0853 100		
	15.0 m	21 33 290 0853 150		
	20.0 m	21 33 290 0853 200		
both sides assembled		Black		
Length	1.0 m	21 33 292 9853 010		
	1.5 m	21 33 292 9853 015		
	2.0 m	21 33 292 9853 020		
	3.0 m	21 33 292 9853 030		
	5.0 m	21 33 292 9853 050		
	7.5 m	21 33 292 9853 075		
	10.0 m	21 33 292 9853 100		
	15.0 m	21 33 292 9853 150		
	20.0 m	21 33 292 9853 200		

Other cable lengths on request

Notes

Technical characteristics

Contacts	2
Electrical data acc. to IEC 61984	**5 A 50 V 0.8 kV 3**
Rated current	5 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ohm
Limiting temperatures	-40 °C … 85 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate
Colour (insert)	RAL 7032 (light grey)
Material (accessories)	metal

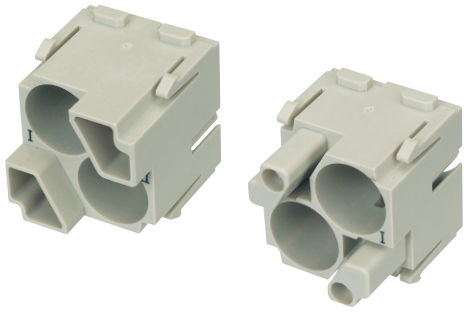
Specifications / Approvals

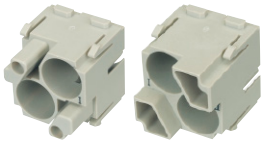
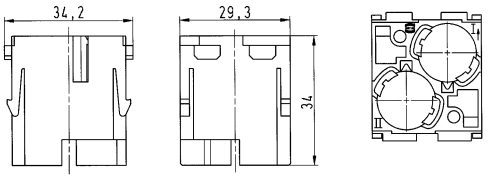
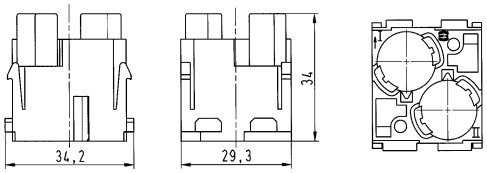
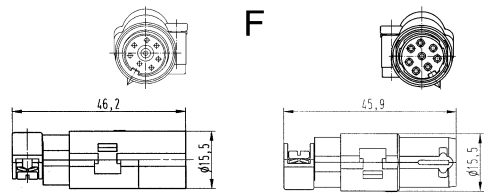
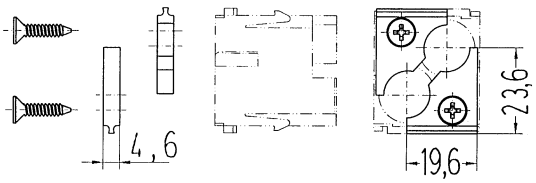
IEC 60664-1
IEC 61984

Han-Quintax® module

Number of contacts

2



Identification	Wire gauge (mm²)	Part number male	Part number female	Drawing	Dimensions in mm
Han-Modular®, Han-Quintax® module Crimp terminal 		09 14 002 3001	09 14 002 3101	M  F  Contact arrangement (view from termination side)	
Han-Modular®, Han-Quintax® High Density contact 8 + shielding, for Han® D-Sub contacts  Please order contacts separately		09 15 008 3013	09 15 008 3113	M F 	
Han-Quintax® Adapter  optional		09 14 000 9915	09 14 000 9915		
Han® D-Sub crimp contact, turned contacts 	0.09-0.25 0.13-0.33 0.25-0.52	09 67 000 7576 09 67 000 5576 09 67 000 8576	09 67 000 7476 09 67 000 5476 09 67 000 8476		

Wire gauge	max. Insulation Ø	Stripping length
0.09-0.25 mm²	1.7 mm	4 mm
0.13-0.33 mm²	1.7 mm	4 mm
0.25-0.52 mm²	1.7 mm	4 mm

Han® GigaBit module

Features

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

Specifications / Approvals

IEC 60664-1
IEC 61984

Technical characteristics

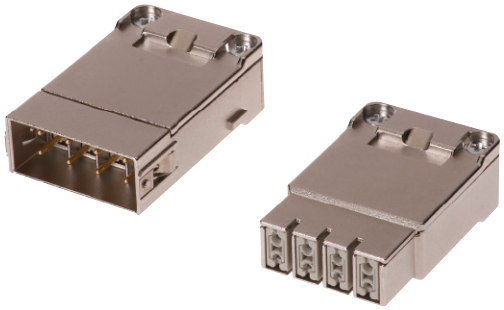
Contacts	8
Electrical data acc. to IEC 61984	**5 A 50 V 0.8 kV 3**
Rated current	5 A
Rated voltage	50 V
Rated impulse voltage	0.8 kV
Pollution degree	3
Insulation resistance	≥ 10^{10} Ohm
Limiting temperatures	-40 °C … 85 °C
Flammability (insert) acc. to UL 94	V 0
Mating cycles	≥ 500
Material (insert)	polycarbonate
Colour (insert)	RAL 7032 (light grey)
Material (shielding element)	zinc die-cast alloy
Material (outer conductor)	zinc alloy
Surface (outer conductor)	nickel plated contacts

Han® GigaBit module

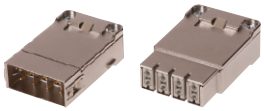
Number of contacts

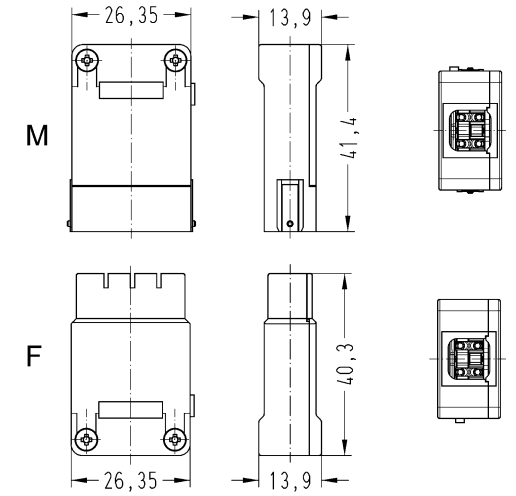
8

50 V
5 A
+ shielding

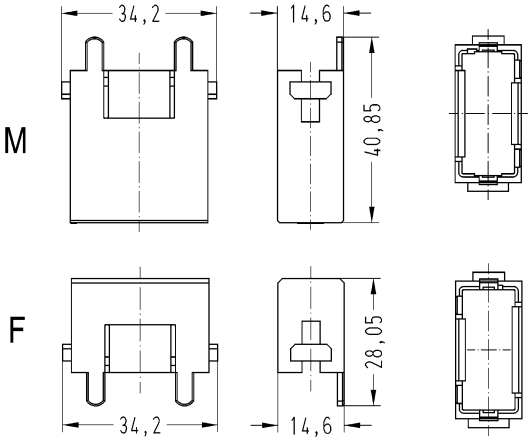


Identification	Wire gauge (mm²)	Part number male	Part number female	Drawing	Dimensions in mm
Han-Modular®, Han® Gigabit Insert Crimp terminal Please order crimp contacts separately Please order the adapter module separately		09 14 008 3011	09 14 008 3111		
Han-Modular®, Adapter module		09 14 001 3011	09 14 001 3111		
Han® D-Sub crimp contact, turned contacts	0.09-0.25 0.13-0.33 0.25-0.52	09 67 000 7576 09 67 000 5576 09 67 000 8576	09 67 000 7476 09 67 000 5476 09 67 000 8476		





Contact arrangement (view from termination side)



Wire gauge	max. Insulation Ø	Stripping length
0.09-0.25 mm²	1.7 mm	4 mm
0.13-0.33 mm²	1.7 mm	4 mm
0.25-0.52 mm²	1.7 mm	4 mm

HARTING Ha-VIS MVB data bus cable 120 Ω, 2 x 0.5 mm²

Ha-VIS data bus cable
2-wire, elastic

Advantages

- Halogen free
- Electron-beam cross-linked cable
- Improved fire performance
- High resistance to temperature
- Conform to MVB standard according IEC 61 375-3-1

Applications

For fixed and moveable installation inside of rail vehicles and buses. For symmetrical signal and data transmission with impedance of 120 Ohm. Suitable for use in MVB (Multifunction Vehicle Bus) as part of the TCN (Train Communication Network). Especially designed for termination with HARTING D-Sub InduCom and Han-Quintax® and other railway-specific Han® connectors and housings.

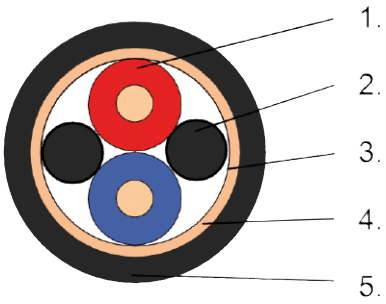
Features

• Sheath material	Elastomer, electron beam cross-linked
• Category	MVB bus 120 Ω
• Number of wires	2 and more pairs
• Wire design	2 x 0.5 mm² or higher number of pairs on request
• Cable sheath diameter	7.9 mm

HARTING Ha-VIS MVB data bus cable 120 Ω, 2 x 0.5 mm²

Ha-VIS data bus cable
2-wire, elastic

Identification	Part No.
Ha-VIS data bus cable 2-wire, elastic Sheath material: Elastomer, electron-beam cross-linked, COMP 603 Colour: black Nominal voltage: 300 V Testing voltage: Conductor/conductor 2 kV AC Conductor/shielding 2 kV AC Maximum conductor resistance @ 20 °C: < 40.1 mΩ / m Impedance @ 0.75 – 3 MHz: 120 Ω ± 12 Ω Transfer impedance @ 20 MHz: ≤ 20 mΩ / m Attenuation: 1 MHz: ≤ 12 dB / km 3 MHz: ≤ 17 dB / km 4 MHz: ≤ 22 dB / km Maximum conductor temperature: Fixed installed -40 °C … +90 °C Short circuit +160 °C Minimum bending radius: Fixed installed > 6 x diameter Cable sheath diameter: (Ø 7.9 ± 0.2) mm Cable weight: 85 kg / km 500 m drum	09 45 600 0270



1. **Pair**
   Conductor: tinned copper strands 0.5 mm² according to VDE 0295 / IEC 60228 Class 5 construction 16 x 0.20 mm, Ø 0.85 mm
   Insulation: Polyethylene (PE), cross-linked, Comp 655 Ø 2.85 mm
   Colours: red, blue
2. **Filler**
3. **Wrapping**
   Plastic tape
4. **Shielding**
   Aluminium-bonded polyester tape with tinned fine copper braid, Ø 6.5 mm
5. **Jacket**
   Elastomer electron-beam cross-linked Comp 603, Ø 7.9 mm
   Colour: black

HARTING Ha-VIS WTB data bus cable 120 Ω, 2 x 0.75 mm²

Ha-VIS data bus cable
2-wire, elastic

Advantages

- Halogen free
- Electron-beam cross-linked cable
- Improved fire performance
- High resistance to temperature
- Conform to UIC 558 standard
- Conform to WTB standard according IEC 61 375-2-1

Applications

For fixed and moveable installation inside of rail vehicles and buses. For symmetrical signal and data transmission with impedance of 120 Ohm. Suitable for use in WTB (Wire Train Bus) as part of the TCN (Train Communication Network) according UIC 558.
Especially designed for termination with HARTING D-Sub InduCom and Han-Quintax® and other railway- specific Han® connectors and housings.

Features

• Sheath material	Elastomer, electron beam cross-linked
• Category	WTB bus 120 Ω
• Number of wires	2 and more pairs
• Wire design	2 x 0.75 mm² or higher number of pairs on request
• Cable sheath diameter	9.6 mm

HARTING Ha-VIS WTB data bus cable 120 Ω, 2 x 0.75 mm²

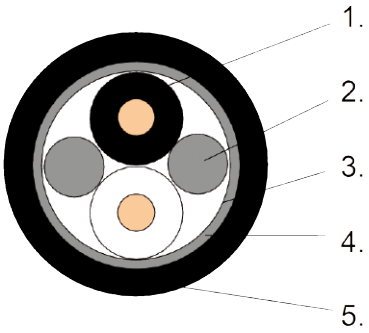
Ha-VIS data bus cable
2-wire, elastic

Identification	Part No.
Ha-VIS data bus cable 2-wire, elastic	

Sheath material:
Elastomer, electron-beam cross-linked, COMP 603
Colour: black

Nominal voltage:	300 V
Testing voltage:	
Conductor/conductor	2 kV AC
Conductor/shielding	2 kV AC
Maximum conductor resistance @ 20 °C:	< 26.7 mΩ / m
Capacitance @ 1 MHz:	
Wire/wire:	< 65 pF / m
Wire/screen:	< 120 pF / m
Impedance @ 0.75 – 3 MHz:	120 Ω ± 12 Ω
Transfer impedance @ 30 MHz:	≤ 30 mΩ / m
Attenuation:	
1 MHz:	≤ 10 dB / km
4 MHz:	≤ 14 dB / km
5 MHz:	≤ 18 dB / km
Maximum conductor temperature:	
Fixed installed	-40 °C … +90 °C
Short circuit	+160 °C
Minimum bending radius:	
Fixed installed	> 6 x diameter
Cable sheath diameter:	(Ø 9.6 ± 0.2) mm
Cable weight:	114 kg / km

500 m drum	09 45 600 0280



1. **Pair**
   Conductor: tinned copper strands 0.75 mm² according to VDE 0295 / IEC 60228 Class 5 construction 24 x 0.20 mm, Ø 1.1 mm
   Insulation: Polyethylene (PE), cross-linked, Comp 655 Ø 3.7 mm
   Colours: black, white

2. **Filler**
   Polyolefine copolymer

3. **Wrapping**
   Plastic tape

4. **Shielding**
   Aluminium-bonded polyester tape with tinned fine copper braid, Ø 8.2 mm

5. **Jacket**
   Elastomer electron-beam cross-linked Comp 603, Ø 9.6 mm
   Colour: black

HARTING Ha-VIS WTB data bus cable 120 Ω, 2 x 0.75 mm² FOAM

Ha-VIS data bus cable
2-wire, elastic, FOAM

Advantages

- Halogen free
- Electron-beam cross-linked cable
- Improved fire performance
- High resistance to temperature
- Conform to UIC 558 standard
- Conform to WTB standard according IEC 61 375-2-1

Applications

For fixed and moveable installation inside of rail vehicles and buses. For symmetrical signal and data transmission with impedance of 120 Ohm. Suitable for use in WTB (Wire Train Bus) as part of the TCN (Train Communication Network) according UIC 558.
Especially designed for termination with HARTING D-Sub InduCom and Han-Quintax® and other railway- specific Han® connectors and housings.

Features

• Sheath material	Elastomer, electron beam cross-linked
• Category	WTB bus 120 ?
• Number of wires	2 and more pairs
• Wire design	2 x 0.75 mm² or higher number of pairs after request, FOAM insulation
• Cable sheath diameter	8 mm

HARTING Ha-VIS WTB data bus cable 120 Ω, 2 x 0.75 mm² FOAM

Ha-VIS data bus cable
2-wire, elastic, FOAM

Identification	Part No.
Ha-VIS data bus cable 2-wire, elastic, FOAM	

Sheath material:
Elastomer, electron-beam cross-linked, COMP 603
Colour: black

Nominal voltage:	300 V
Testing voltage:	
Conductor/conductor	1.5 kV AC
Conductor/shielding	1.5 kV AC
Maximum conductor resistance @ 20 °C:	< 26.7 mΩ / m
Capacitance @ 1 MHz:	
Wire/wire:	< 65 pF / m
Wire/screen:	< 120 pF / m
Impedance @ 0.75 – 3 MHz:	120 Ω ± 12 Ω
Transfer impedance @ 30 MHz:	≤ 30 mΩ / m
Attenuation:	
1 MHz:	≤ 10 dB / km
2 MHz:	≤ 14 dB / km

Maximum conductor temperature:

Fixed installed	-25 °C … +90 °C
Short circuit	+100 °C

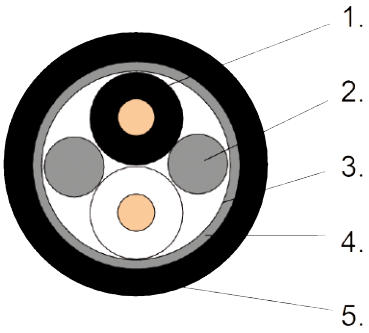
Minimum bending radius:

Fixed installed	> 6 x diameter

Cable sheath diameter: (Ø 8.0 ± 0.2) mm

Cable weight: 79 kg / km

500 m drum	09 45 600 0181
1000 m drum	09 45 600 0191



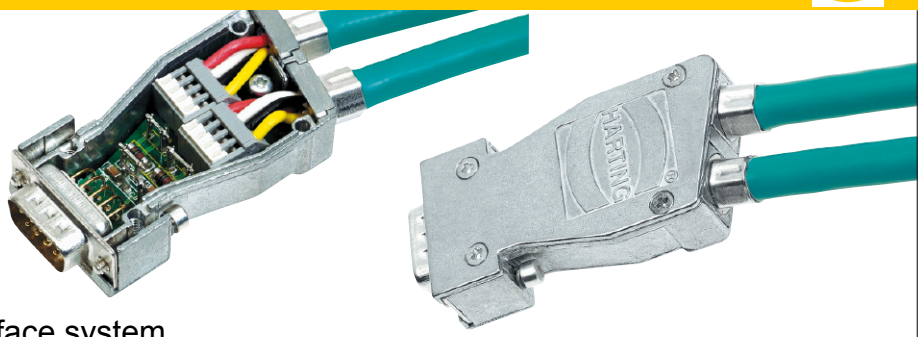
1. **Pair**
   Conductor: tinned copper strands according to VDE 0295 / IEC 60228 Class 5 construction 19 x 0.20 mm, Ø 1.1 mm
   Insulation: FOAM-skin polyolefin, Ø 2.7 mm
   Colours: black, white

2. **Filler**
   Polyolefine copolymer

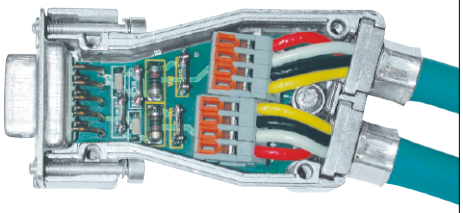
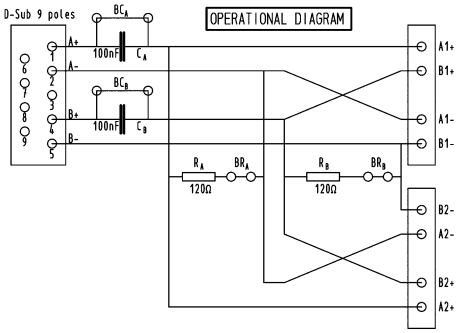
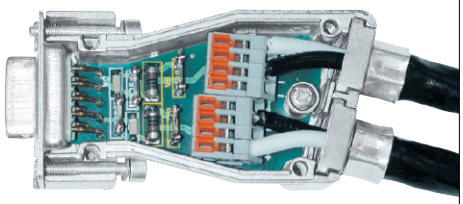
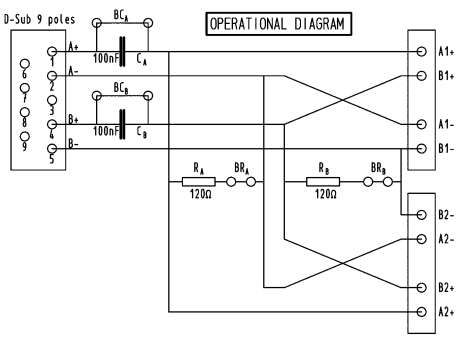
3. **Wrapping**
   Plastic tape

4. **Shielding**
   Tinned fine copper braid, Ø 6.4 mm

5. **Jacket**
   Elastomer electron-beam cross-linked Comp 603, Ø 8.0 mm
   Colour: black

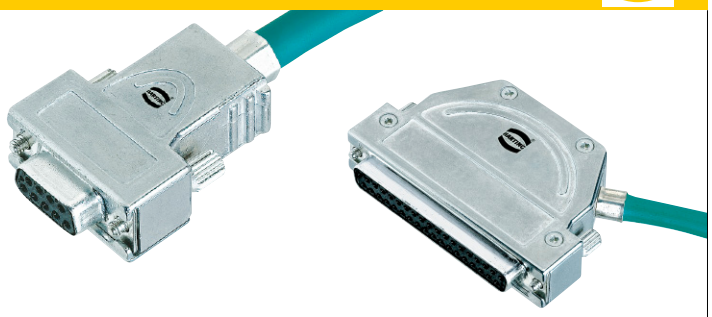


InduCom 9 – Industrial bus interface system

Identification	Part number	General information
MVB Interface  	66 63 009 5013	**MVB backbone interface set** The Multifunctional Vehicle Bus (MVB) backbone interface is specially designed for communication cables in Train Control Networks (TCN). With this interface it is possible to realise a T-bus structure with MVB-cable with which you can disconnect the bus interface from the control unit without any interruption of the complete bus communication. On the PCB you will have load resistors and test capacitors which can be activated with solder bridges. The wires are terminated with the proven vibration resistant cage clamp technology.* **Components of the MVB interface set:** • 1 metal housing with 2 cable entries • 2 hexagonal screws with UNC 4-40 threads • 1 PCB with 9 way D-Sub male connector and cage clamps • 2 crimp flanges for the MVB cable • 2 crimp ferrules for the MVB cable • 1 blanking piece
WTB Interface  	66 63 009 5014	**WTB backbone interface set** The Wired Train Bus (WTB) backbone interface is specially designed for backbone cables in Train Control Networks (TCN). With this interface it is possible to realise a T-bus structure with WTB-cable with which you can disconnect the bus interface from the control unit without any interruption of the complete bus communication. On the PCB you will have load resistors and test capacitors which can be activated with solder bridges. The wires are terminated with the proven vibration resistant cage clamp technology.* **Components of the MVB interface set:** • 1 metal housing with 2 cable entries • 2 hexagonal screws with UNC 4-40 threads • 1 PCB with 9 way D-Sub male connector and cage clamps • 2 crimp flanges for the WTB cable • 2 crimp ferrules for the WTB cable • 1 blanking piece

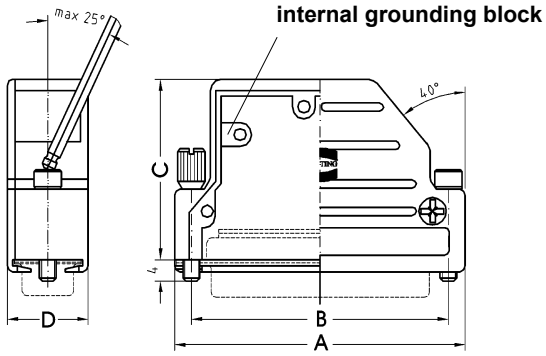
Further bus PCBs on request

* To check compatibility with cable types and manufacturers, please contact your local HARTING representative.



Full metal top and side entry hoods with different screw options

Identification	No. of contacts	Part number	Drawing	Dimensions in mm
40° side entry hood				
with internal grounding block	9	61 03 001 . 013		
	15	61 03 001 . 014		
	25	61 03 001 . 015		
without internal grounding block	9	61 03 001 . 013 010		

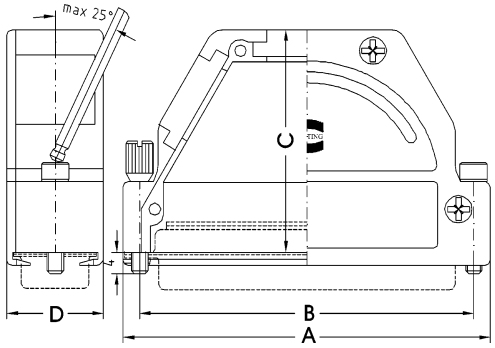


No. of contacts	A	B	C	D
9	31.0	25.0	35.0	15.0
15	39.3	33.3	35.0	15.0
25	53.0	47.0	35.0	15.0

Identification	No. of contacts	Part number	Drawing	Dimensions in mm
Top/side entry hood				
with internal grounding block	9	61 03 001 . 010		
	15	61 03 001 . 016		
	25	61 03 001 . 017[1)]		
	37	61 03 001 . 018[1)]		
	50	61 03 001 . 019[1)]		
without internal grounding block	9	61 03 001 . 010 010		

Please insert digit for screw option

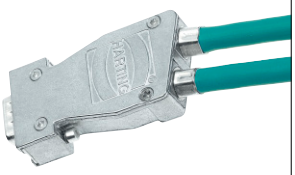
Knurled screw, thread 4-40 UNC ▶	0
Hexagonal screw, thread M3 with captive washer ▶	1
Hexagonal screw, thread 4-40 UNC with captive washer ▶	2
Knurled screw, thread M3 ▶	3



No. of contacts	No. of cable entries	A	B	C	D
9	1 (top)	31.0	25.0	38.0	15.0
15	1 (top)	39.5	33.3	35.0	15.0
25	3	53.0	47.0	43.0	15.0
37	3	69.5	63.5	43.0	15.0
50	3	67.2	61.6	43.0	17.8

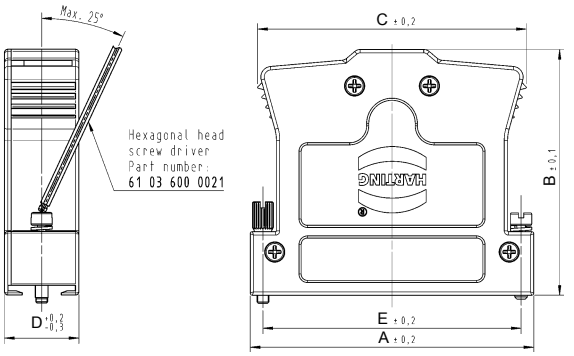
[1)] Part number contains two blanking pieces
Operating temperature for all hoods on this page: -20 °C … +90 °C





Full metal top and side entry hoods with different screw options

Identification	No. of contacts	Part number	Drawing	Dimensions in mm
5° top entry hood with 3 cable entries				
with internal grounding block	37	61 03 001 . 118		
	50	61 03 001 . 119		
without internal grounding block	37	61 03 001 . 118 010		
	50	61 03 001 . 119 010		

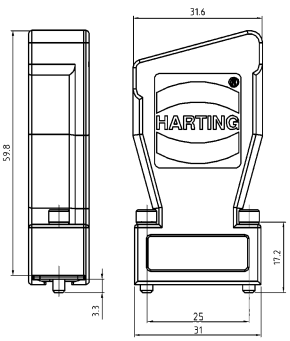


No. of contacts	A	B	C	D	E
37	69.5	52.0	58.2	14.8	63.5
50	67.1	58.0	63.6	17.6	61.1

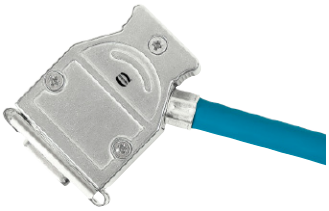
Please insert digit for screw option

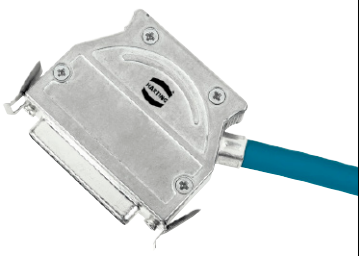
Knurled screw, thread 4-40 UNC ▶	0
Hexagonal screw, thread M3 ▶ with captive washer	1
Hexagonal screw, thread 4-40 UNC ▶ with captive washer	2
Knurled screw, thread M3 ▶	3

Top entry hood for InduCom 9				
Hexagonal screw, thread 4-40 UNC	9	66 67 009 0346		
Hexagonal screw, thread M3	9	66 67 009 0347		



2 cable entries

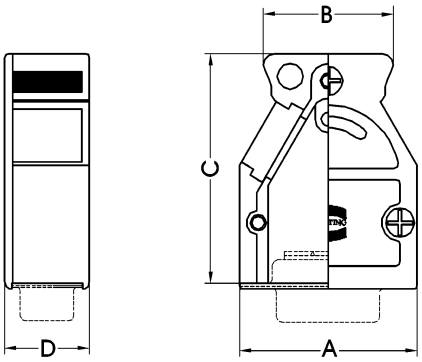




Full metal top and side entry hoods for spring or slide locking

Identification	No. of contacts	Part number
Top/side entry hood with spring/ slide locking	9	61 03 001 0022[1)]
	15	61 03 001 0011[2)]
	25	61 03 001 0012[2)]
	37	61 03 001 0021[2)]
	50	61 03 001 0020[2)]

Drawing



Dimensions in mm

No. of contacts	No. of cable entries	A	B	C	D
9	2	31.0	22.6	40.0	14.8
15	3	39.0	30.6	40.0	14.8
25	3	53.0	42.6	40.0	14.8
37	3	69.5	59.2	40.0	14.8
50	3	67.0	55.0	40.0	17.6

[1)] Part number contains one blanking piece
[2)] Part number contains two blanking pieces

Notes

Directory Chapter 01

Notes

In addition to classic copper cabling, HARTING offers a wide range of fibre optic (FO) cabling components and systems.

FO encompasses three types of cables:

- Multi-mode fibre optic cables and components
- Single-mode fibre optic cables and components
- Polymer optical fibres and components (POF)

While fibre optics can bridge very long distances (up to several kilometres), POF is often used for facilities and machinery construction applications which have an action radius of 50 metres.

POF components are also very quick and easy to assemble in the field, whereas glass fibre optic products often require expertise, care and special tools (splicers, special adhesive and grinding equipment, etc.).

The portfolio shown here includes:

- Fibre optic assemblies with LC, SC and ST connectors (IP20)
- Fibre optic assemblies with LC duplex connectors in HARTING PushPull V4 (IP65 / IP67)
- Fibre optic assemblies with LC duplex connectors in Han® 3 A (IP65 / IP67)
- Hybrid cables and connectors in Han® 3 A (IP65 / IP67) with 2 x GF and 3 x 2.5 mm^2 copper each
- POF SCRJ system cables in IP20 and in Han® PushPull V14 in IP65 / IP67; PROFINET compliant
- PushPull XS SFP components

Fibre optic cables are much more sensitive overall than copper wires during their assembly, testing, routing (bending, torsion, tensile stress) and in operation (pressure sensitivity and temperature fluctuations).

They do, however, offer advantages in regards to their bandwidth/transfer rate, bridging distances (not limited to 100 m), and EMC behaviour (no shielding or grounding necessary).

This catalogue should not be used to find the optimal solution for a particular application. Recommendations can only be made for well known, specific application types (e.g. PROFINET automation).

HARTING HCS (http://www.harting-customised-solutions.com/en/home/) provides more help in developing customised solutions in the railway sector.

General

Apart from applications in the field of telecommunications, fibre optic technology is of great importance in the industrial market sector. In telecommunications there are requirements for:

- High transmission capacity
- Low cable attenuation
- No crosstalk

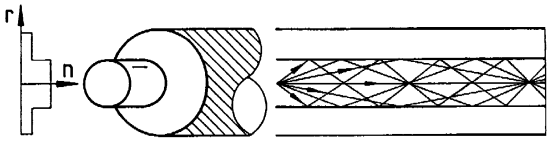
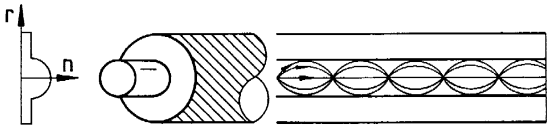
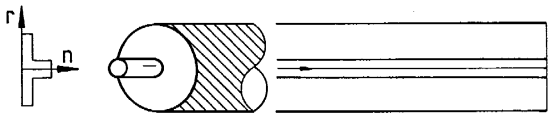
These features are also required in the industrial sector along with the following major considerations:

- Zero susceptibility to electromagnetic interference
- Electrical insulation between transmitter and receiver
- Small cable diameter

Fibre optic communication works by pulses of light. When feeding them in at one end of the fibre optic cable, the pulses are passed to the other end by total internal reflection.

Total internal reflection occurs at the boundary layer between core and cladding by virtue of the different values of optical refractive index (n) between the two materials (n cladding less than n core).

There are three different types of optical fibres:

		Typical Dimensions Core/ Cladding Ø	Attenuation
Step index (SI) fibre HCS® [1] / POF[2]		200 / 230 µm	5 dB/km … 8 dB/km 0.2 dB/km
Gradient index(GI) fibre		50 /125 µm	2.6 dB/km 3.2 dB/km
Single modem fibre		9 / 125 µm	< 0.3 dB/km

optical refractive index profile

The single modem fibre is mainly used in telecommunications because of its low attenuation and wide band-width.

The gradient index fibre and the step fibre with their large core diameters are chiefly used as communication cables in industrial applications due to their easy handling and relatively low costs. The link length ranges from several meters to several kilometers.

Mounting of connectors for gradient fibres is achieved by the use of adhesive.

For POF[2] or HCS® [1] fibres, the crimping technique eases the connector attachment.

With the advanced HARTING quick assembly components, POF-cables can be mounted without the need of special tools. HARTING F.O. systems are designed for gradient index fibres with a core diameter of 50 and 62.5 µm as well as for 200 µm (HCS® [1]) and 1 mm (POF[2]) step index fibres.

The typical operating wavelengths are 660 nm (POF[2], HCS® [1]), 850 nm (GI, HCS® [1]) and 1300 nm (GI).

[1] HCS® (=Hard Clad Silica) is registered trade mark of SpecTran Corporation
[2] POF = Polymer Optical Fibre

Dimensioning of F.O. Transmission Systems

For reliable operation of a F.O. data transmission system it is essential that the transmitted optical signals arrive at the receiver with sufficient amplitude. The incident power should at least exceed twice (+ 3 dB) the value of the minimum sensitivity of the receiver. Otherwise, the inherent noise of the system may result in increasing randomly distributed transmission errors in the data transfer. Therefore, in system design the power budget of the optical path has to be checked. The following aspects have to be considered:

- Optical power output of the transmitter
  The optical power generated by the LED does mainly depend on the applied forward current.Typical power levels coupled into the core are:

  for glass-fibre (λ = 850 nm):
  50/ 125 µm GI fibre: 80 µW
  200/ 230 µm SI fibre: 250 µW
  for Polymer fibre (λ = 660 nm):
  980/1000 µm: 600 µW

- Specific attenuation-coefficient of the fibre
  The specific attenuation of optical fibres depends on the wavelength applied and is specified in dB/km.
  Typical values are:

  for glass-fibres (λ = 850 nm):
  50/ 125 µm GI fibre: ---3 dB/km
  200/ 230 µm HCS: ---5 dB/km
  for polymer fibre (λ = 660 nm):
  980/1000 µm (PMMA): ---0.2 dB/m
  The fibre loss usually contributes to the highest amount to the overall transmission index of the optical link.

- Additional interconnections in the cable system
  Interconnections in the optical link create some further attenuation for the travelling optical signals.
  Typical insertion loss is
  - for a spliced connection ≤ 0.3 dB
  - for a connector-set 0.8 dB … 0.5 dB

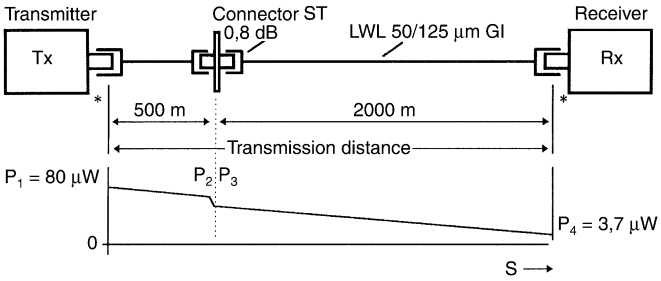
  depending on the type of fibre and the connectors applied.

- Sensitivity of the optical receiver DC-coupled optical receivers, commonly used, with SI-diodes as receiving elements show typical minimum sensitivities of
  ≤ 3 µW @ 850 nm (glass fibre systems)
  ≤ 5 µW @ 660 nm (polymer fibre systems)

- Temperature dependence and ageing of LED, thermal influence on cable loss
  These items should be taken into account with an amount of 2 dB. Thus, in total a system reserve of 5 dB has to be considered in the link power budget.

Examples

a) Glass fibre system (λ = 850 nm)



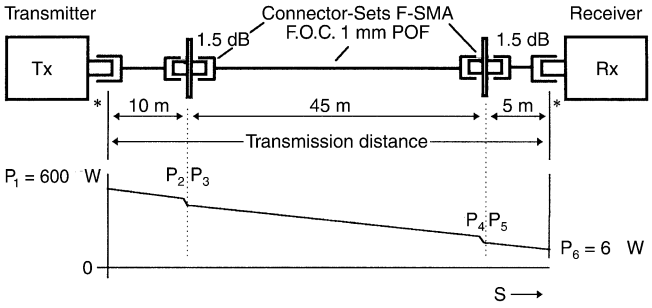
Link budget analysis:
Transmitter:
P1 = 80 µW = -11 dBm
power coupled into fibre core

Cable Loss: 2.5 km x 3 dB/km	= 7.5 dB
Loss per connector set ST	= 0.8 dB
System reserves (3 dB + 2 dB)	= 5.0 dB
Total system losses:	**13.3 dB**

Incident power at receiver: P4 = - 24.3 dBm = 3.7 µW
This satisfies the required minimum-conditions ≥ 3 µW

* The injection- and decoupling-loss at the transmitter- and receiver-ends of the fibre has not additionally to be taken into account as they are alraedy included in the given power ratings of these elements.

b) Polymer fibre system (λ = 660 nm)

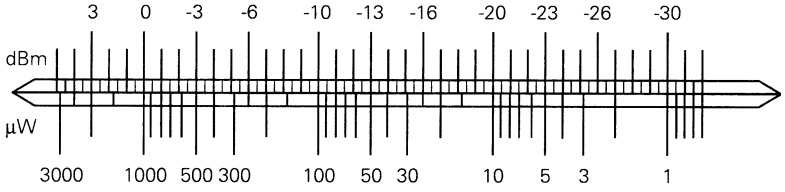


Link budget analysis:
Transmitter:
P1 = 600 µW = -2.2 dBm
power coupled into fibre core

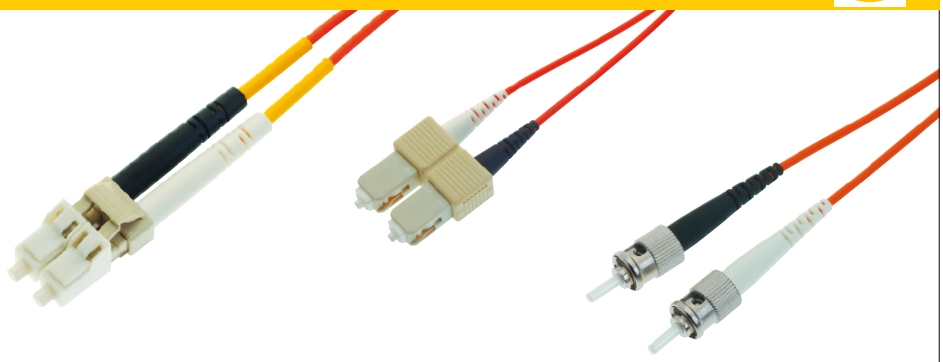
Cable loss: 60 m x 0.2 dB/m	= 12 dB
2 connector-sets F-SMA (2 x 1.5 dB)	= 3.0 dB
System reserves (3 dB + 2 dB)	= 5.0 dB
Total system losses:	**20.0 dB**

Incident power at receiver:
P6 = - 22.2 dBm = 6.0 µW
This satisfies the required minimum-conditions ≥ 5 µW
Omitting the additional interconnections in the cable (here e.g. the 2 F-SMA connector sets) results in larger maximum transmission distances.

Conversion Diagram



HARTING Ethernet cabling – fibre optic cords



System cable fibre optics

Features

- Connector types: LC / SC / ST
- Type of core: Single and multi mode
- Number of cores: 2
- Wiring: Crossed (boot marking)
- Sheath material: LSZH

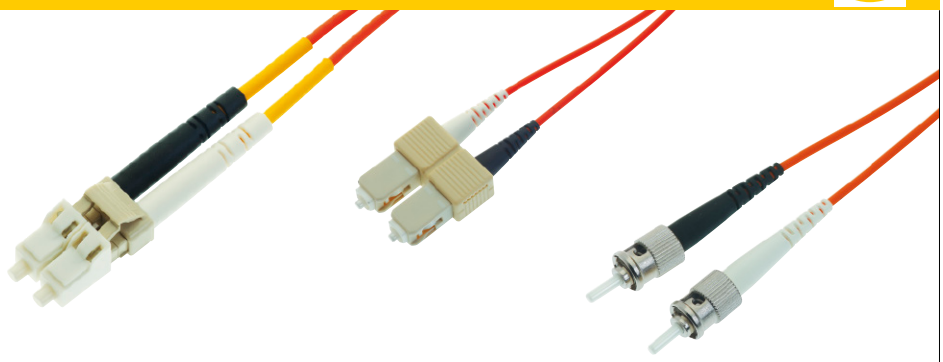
Advantages

- Transmission of up to 10 Gbit/s
- Flexible, space saving
- Verified after assembling
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

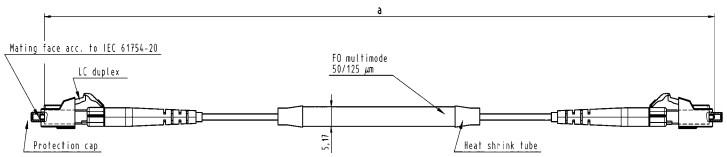
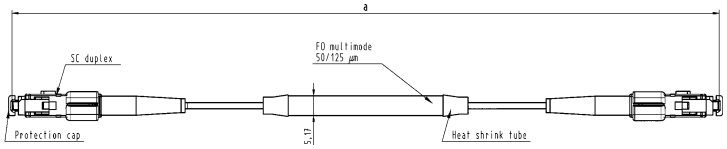
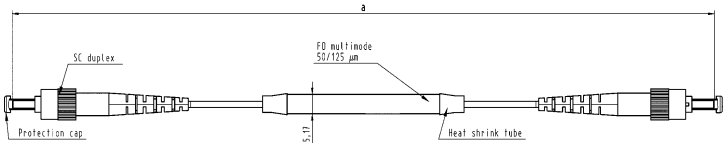
Applications

- Industrial cabling
- Within switch cabinets
- In IT Networks

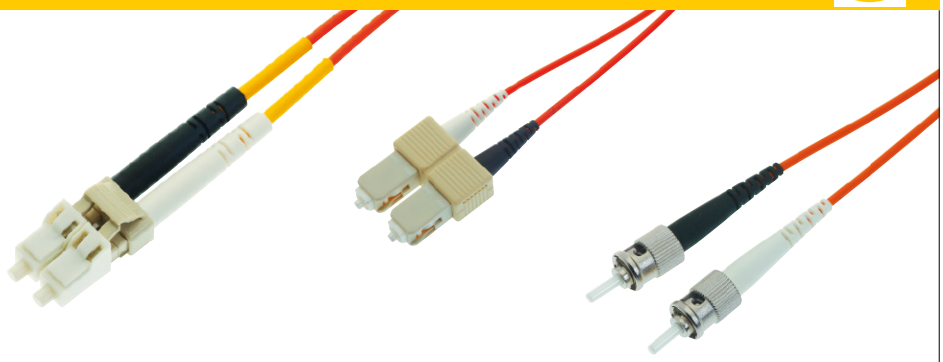
Other cable lengths on request



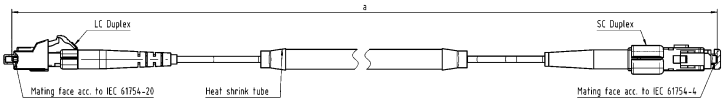
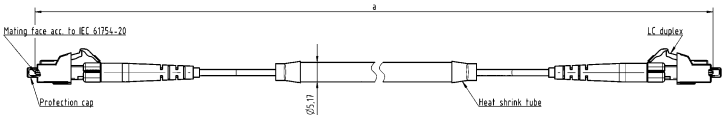
System cable fibre optics

Identification	Part number	Drawing	Dimensions in mm
Jumper cable 2 x LC duplex multi mode 50/125 µm			
Length: a = 1 m	33 01 241 0010 005		
a = 2 m	33 01 241 0020 005		
a = 3 m	33 01 241 0030 005		
a = 4 m	33 01 241 0040 005		
a = 5 m	33 01 241 0050 005		
a = 6 m	33 01 241 0060 005		
a = 7 m	33 01 241 0070 005		
a = 8 m	33 01 241 0080 005		
a = 9 m	33 01 241 0090 005		
a = 10 m	33 01 241 0100 005		
Jumper cable 2 x SC duplex multi mode 50/125 µm			
Length: a = 1 m	33 01 241 0010 006		
a = 2 m	33 01 241 0020 006		
a = 3 m	33 01 241 0030 006		
a = 4 m	33 01 241 0040 006		
a = 5 m	33 01 241 0050 006		
a = 6 m	33 01 241 0060 006		
a = 7 m	33 01 241 0070 006		
a = 8 m	33 01 241 0080 006		
a = 9 m	33 01 241 0090 006		
a = 10 m	33 01 241 0100 006		
Jumper cable 2 x ST duplex multi mode 50/125 µm			
Length: a = 1 m	33 01 241 0010 007		
a = 2 m	33 01 241 0020 007		
a = 3 m	33 01 241 0030 007		
a = 4 m	33 01 241 0040 007		
a = 5 m	33 01 241 0050 007		
a = 6 m	33 01 241 0060 007		
a = 7 m	33 01 241 0070 007		
a = 8 m	33 01 241 0080 007		
a = 9 m	33 01 241 0090 007		
a = 10 m	33 01 241 0100 007		

Other cable lengths on request



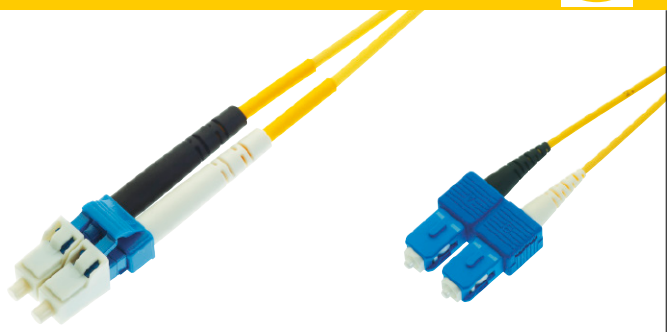
System cable fibre optics

Identification	Part number	Drawing	Dimensions in mm
Adapter cable SC duplex – LC duplex multi mode 50/125 µm			
Length: a = 1 m	33 01 241 0010 034		
a = 2 m	33 01 241 0020 034		
a = 3 m	33 01 241 0030 034		
a = 4 m	33 01 241 0040 034		
a = 5 m	33 01 241 0050 034		
a = 6 m	33 01 241 0060 034		
a = 7 m	33 01 241 0070 034		
a = 8 m	33 01 241 0080 034		
a = 9 m	33 01 241 0090 034		
a = 10 m	33 01 241 0100 034		
Adapter cable SC duplex – LC duplex multi mode 50/125 µm OM3			
Length: a = 1 m	33 01 241 0010 027		
a = 2 m	33 01 241 0020 027		
a = 3 m	33 01 241 0030 027		
a = 4 m	33 01 241 0040 027		
a = 5 m	33 01 241 0050 027		
a = 6 m	33 01 241 0060 027		
a = 7 m	33 01 241 0070 027		
a = 8 m	33 01 241 0080 027		
a = 9 m	33 01 241 0090 027		
a = 10 m	33 01 241 0100 027		

Other cable lengths on request

Notes

HARTING Ethernet cabling – fibre optic cords



System cable fibre optics

Features

- Connector types: LC / SC / ST
- Type of core: Single and multi mode
- Number of cores: 2
- Wiring: Crossed (boot marking)
- Sheath material: LSZH

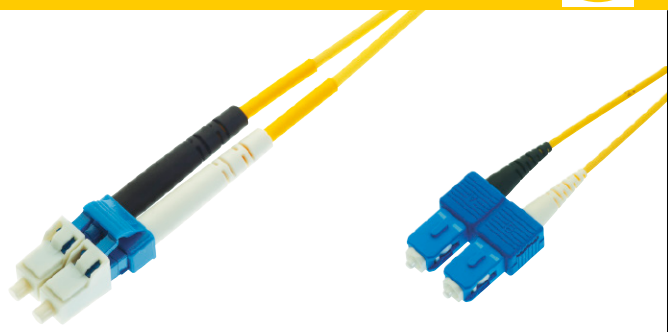
Advantages

- Transmission of up to 10 Gbit/s
- Flexible, space saving
- Verified after assembling
- Halogen free and RoHS compliant
- Compliant acc. ISO/IEC 11801

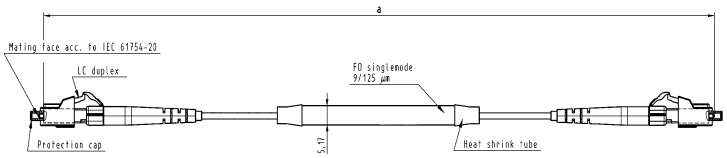
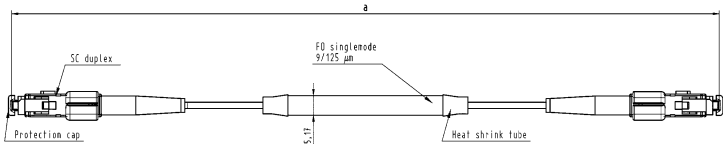
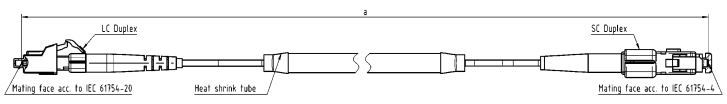
Applications

- Industrial cabling
- Within switch cabinets
- In IT Networks

Other cable lengths on request



System cable fibre optics

Identification	Part number	Drawing	Dimensions in mm
Jumper cable 2 x LC duplex single mode 9/125 µm			
Length: a = 1 m	33 01 241 0010 008		
a = 2 m	33 01 241 0020 008		
a = 3 m	33 01 241 0030 008		
a = 4 m	33 01 241 0040 008		
a = 5 m	33 01 241 0050 008		
a = 6 m	33 01 241 0060 008		
a = 7 m	33 01 241 0070 008		
a = 8 m	33 01 241 0080 008		
a = 9 m	33 01 241 0090 008		
a = 10 m	33 01 241 0100 008		
Jumper cable 2 x SC duplex single mode 9/125 µm			
Length: a = 1 m	33 01 241 0010 009		
a = 2 m	33 01 241 0020 009		
a = 3 m	33 01 241 0030 009		
a = 4 m	33 01 241 0040 009		
a = 5 m	33 01 241 0050 009		
a = 6 m	33 01 241 0060 009		
a = 7 m	33 01 241 0070 009		
a = 8 m	33 01 241 0080 009		
a = 9 m	33 01 241 0090 009		
a = 10 m	33 01 241 0100 009		
Adapter cable SC duplex – LC duplex single mode 9/125 µm			
Length: a = 1 m	33 01 241 0010 033		
a = 2 m	33 01 241 0020 033		
a = 3 m	33 01 241 0030 033		
a = 4 m	33 01 241 0040 033		
a = 5 m	33 01 241 0050 033		
a = 6 m	33 01 241 0060 033		
a = 7 m	33 01 241 0070 033		
a = 8 m	33 01 241 0080 033		
a = 9 m	33 01 241 0090 033		
a = 10 m	33 01 241 0100 033		

Other cable lengths on request

HARTING PushPull

Features

- Connector types: PushPull V4, LC duplex
- Type of core: Single and multi mode
- Number of cores: 2
- Wiring: Crossed
- Sheath material: PUR

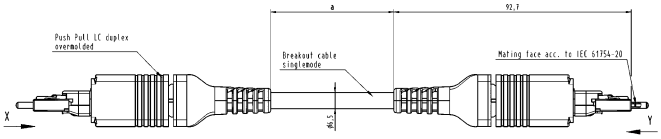
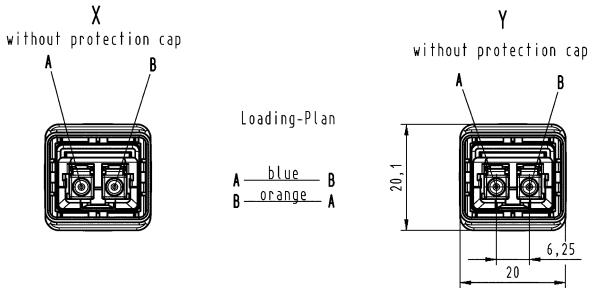
Advantages

- Transmission of up to 10 Gbit/s
- Flexible, space saving
- Simple handling by HARTING PushPull
- Suitable for outdoor application

Applications

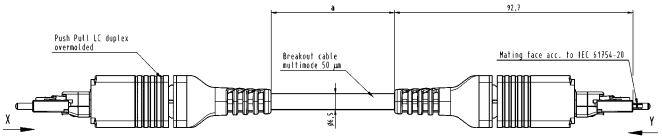
- Industrial cabling
- Outdoor installation
- Antenna cabling

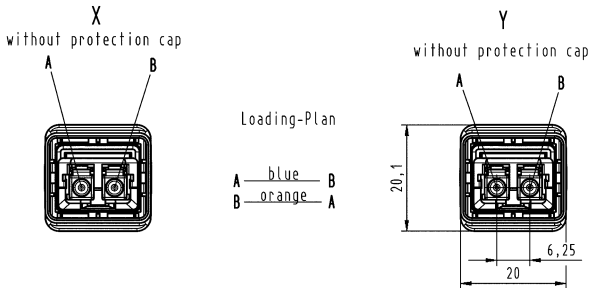
Other cable lengths on request

Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, single mode overmoulded		double ended	
Length: a = 1 m	33 58 231 0010 015		
a = 3 m	33 58 231 0030 015		
a = 5 m	33 58 231 0050 015	a = length	
a = 10 m	33 58 231 0100 015		
a = 20 m	33 58 231 0200 015		
a = 30 m	33 58 231 0300 015		
a = 40 m	33 58 231 0400 015		
a = 50 m	33 58 231 0500 015		
a = 60 m	33 58 231 0600 015		
a = 70 m	33 58 231 0700 015		
a = 80 m	33 58 231 0800 015		
a = 90 m	33 58 231 0900 015		
a = 100 m	33 58 231 1000 015		
a = 300 m	33 58 231 3000 015		
Fibre optic breakout cable, single mode			
Length: 10 m	33 58 751 0100 002	PUR jacket 2-fibre single mode Outer diameter: 6.5 mm Min. bending radius: Installation: 10.4 cm Operating: 5.2 cm	
Length: 20 m	33 58 751 0200 002		
Length: 100 m	33 58 751 1000 002		

Other cable lengths on request

Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, multi mode, 50 µm overmoulded		double ended	
Length: a = 1 m	33 58 231 0010 017		
a = 3 m	33 58 231 0030 017		
a = 5 m	33 58 231 0050 017	a = length	
a = 10 m	33 58 231 0100 017		
a = 20 m	33 58 231 0200 017		
a = 30 m	33 58 231 0300 017		
a = 40 m	33 58 231 0400 017		
a = 50 m	33 58 231 0500 017		
a = 60 m	33 58 231 0600 017		
a = 70 m	33 58 231 0700 017		
a = 80 m	33 58 231 0800 017		
a = 90 m	33 58 231 0900 017		
a = 100 m	33 58 231 1000 017		
a = 300 m	33 58 231 3000 017		
Fibre optic breakout cable, multi mode			
Length: 10 m	33 58 751 0100 003		
Length: 20 m	33 58 751 0200 003		
Length: 100 m	33 58 751 1000 003		

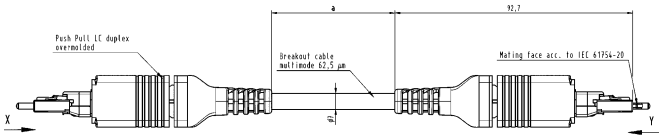
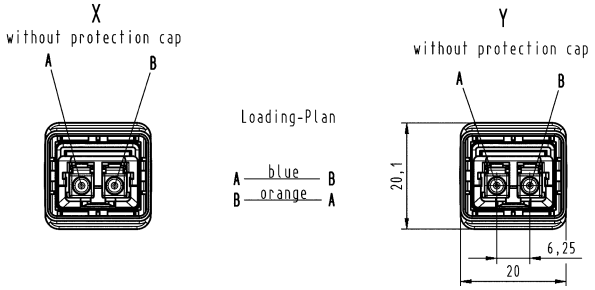




PUR jacket

2-fibre multi mode	50 µm
Outer diameter:	6.5 mm
Min. bending radius:	
Installation:	10.4 cm
Operating:	5.2 cm

Other cable lengths on request

Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, multi mode, 62.5 µm overmoulded		double ended	
Length: a = 1 m	33 58 231 0010 016		
a = 3 m	33 58 231 0030 016		
a = 5 m	33 58 231 0050 016	a = length	
a = 10 m	33 58 231 0100 016		
a = 20 m	33 58 231 0200 016		
a = 30 m	33 58 231 0300 016		
a = 40 m	33 58 231 0400 016		
a = 50 m	33 58 231 0500 016		
a = 60 m	33 58 231 0600 016		
a = 70 m	33 58 231 0700 016		
a = 80 m	33 58 231 0800 016		
a = 90 m	33 58 231 0900 016		
a = 100 m	33 58 231 1000 016		
a = 300 m	33 58 231 3000 016		
Fibre optic breakout cable, multi mode, 62.5 µm			PUR jacket 2-fibre multi mode 62.5 µm Outer diameter: 7 mm Min. bending radius: Installation: 10.5 cm Operating: 7.0 cm
Length: 10 m	33 58 751 0100 001		
Length: 20 m	33 58 751 0200 001		
Length: 100 m	33 58 751 1000 001		

Other cable lengths on request

Han® 3 A

Features

- Connector types: 2 x Han® 3 A, 2 x LC duplex
- Type of core: Single and multi mode
- Sheath material: PVC, FRNC

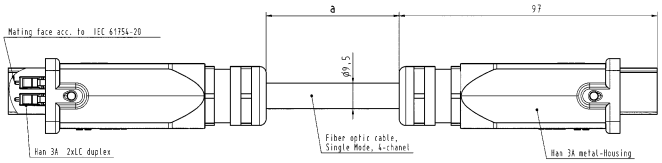
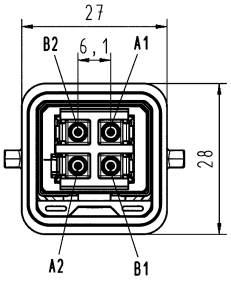
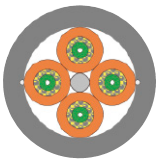
Advantages

- Transmission of up to 10 Gbit/s
- Extremely robust
- Secured locking by Han® 3 A housing
- Suitable for outdoor application

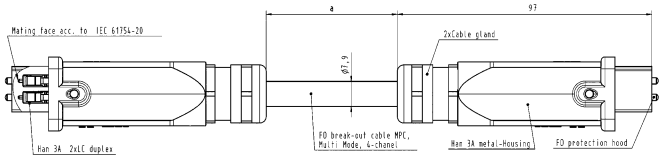
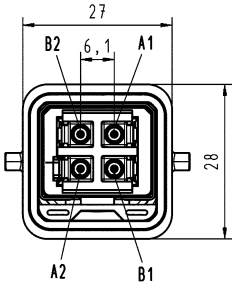
Applications

- Industrial cabling
- Outdoor installation
- Antenna cabling
- Mining industry

Other cable lengths on request

Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, single mode, metal **2 x Han® 3 A, 2 x LC duplex**		double ended	
Length: a = 1 m	33 54 211 0010 001		
a = 5 m	33 54 211 0050 001		
a = 10 m	33 54 211 0100 001	a = length	
a = 20 m	33 54 211 0200 001		
a = 40 m	33 54 211 0400 001		
a = 50 m	33 54 211 0500 001		
a = 100 m	33 54 211 1000 001		
		Protection level: IP65 / IP67	
Fibre optic breakout cable, single mode			
Length: 10 m	33 54 751 0100 001		PVC jacket 4-fibre single mode Outer diameter: 9.5 mm Min. bending radius: Installation: 15 x OD Operating: 10 x OD
Length: 20 m	33 54 751 0200 001		
Length: 100 m	33 54 751 1000 001		

Other cable lengths on request

Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable, double ended, multi mode, metal, 50 µm 2 x Han® 3 A, 2 x LC duplex		double ended	
Length: a = 1 m	33 54 211 0010 002		
a = 5 m	33 54 211 0050 002		
a = 10 m	33 54 211 0100 002	a = length	
a = 20 m	33 54 211 0200 002		
a = 40 m	33 54 211 0400 002		
a = 50 m	33 54 211 0500 002		
a = 100 m	33 54 211 1000 002		
		Protection level: IP65 / IP67	
Fibre optic breakout cable, multi mode, 50 µm			
Length: 10 m	33 54 751 0100 002	FRNC jacket	
Length: 20 m	33 54 751 0200 002	4-fibre multi mode 50 µm Outer diameter: 7.9 mm Min. bending radius: Installation: 9.8 cm Operating: 7.9 cm	
Length: 100 m	33 54 751 1000 002		

Other cable lengths on request

Notes

Han® 3 A

Features

- Connector types: Han® 3 A, LC duplex, Hybrid
- Type of core: Single and multi mode
- Number of cores: 2 + 3 x power
- Wiring: Crossed (power 1:1)
- Sheath material: PVC

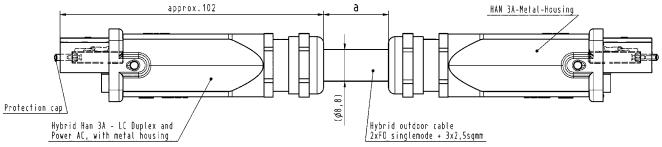
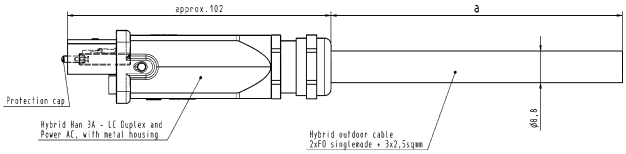
Advantages

- Transmission of up to 10 Gbit/s
- Extremely robust
- Secured locking by Han® 3 A housing
- Suitable for outdoor application

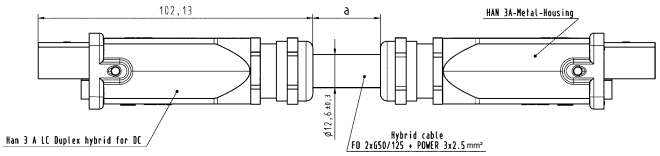
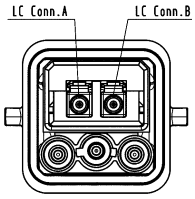
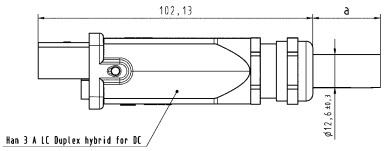
Applications

- Industrial cabling
- Outdoor installation
- Antenna cabling
- Mining industry

Other cable lengths on request

Identification			Part number	Drawing	Dimensions in mm
Hybrid fibre optic cable, single mode, double ended 2 x FO + 3 x 2.5 mm², 2 x Han® 3 A				double ended	
Length:	a = 1 m	AC version	33 57 211 0015 003		
		DC version	33 57 211 0015 004		
	a = 5 m	AC version	33 57 211 0055 003		
		DC version	33 57 211 0055 004	a = length	
	a = 10 m	AC version	33 57 211 0105 003		
		DC version	33 57 211 0105 004		
	a = 20 m	AC version	33 57 211 0205 003		
		DC version	33 57 211 0205 004		
	a = 40 m	AC version	33 57 211 0405 003		
		DC version	33 57 211 0405 004		
	a = 50 m	AC version	33 57 211 0505 003		
		DC version	33 57 211 0505 004	Protection level: IP65 / IP67	
	a = 100 m	AC version	33 57 211 1005 003		
		DC version	33 57 211 1005 004		
Hybrid fibre optic cable, single mode, single ended 2 x FO + 3 x 2.5 mm², 1 x Han® 3 A				single ended	
Length:	a = 1 m	AC version	33 57 111 0015 003		
		DC version	33 57 111 0015 004		
	a = 5 m	AC version	33 57 111 0055 003		
		DC version	33 57 111 0055 004	a = length	
	a = 10 m	AC version	33 57 111 0105 003		
		DC version	33 57 111 0105 004		
	a = 20 m	AC version	33 57 111 0205 003		
		DC version	33 57 111 0205 004		
	a = 40 m	AC version	33 57 111 0405 003		
		DC version	33 57 111 0405 004		
	a = 50 m	AC version	33 57 111 0505 003		
		DC version	33 57 111 0505 004		
	a = 100 m	AC version	33 57 111 1005 003		
		DC version	33 57 111 1005 004		
Hybrid fibre optic cable, single mode					PVC jacket 2 x 9/125 + 3 x 2.5 mm² Outer diameter: 12.6 mm Min. bending radius: single: 5 x OD repeated: 10 x OD
	Length: 10 m		33 57 851 0100 004		
	Length: 20 m		33 57 851 0200 004		
	Length: 500 m		33 57 851 5000 004		

Other cable lengths on request

Identification			Part number	Drawing	Dimensions in mm
Hybrid fibre optic cable, multi mode, double ended 2 x G50/125 + 3 x 2.5 mm²				double ended	
Length:	a = 1 m	AC version	33 57 211 0015 001		
		DC version	33 57 211 0015 002		
	a = 5 m	AC version	33 57 211 0055 001		
		DC version	33 57 211 0055 002	a = length	
	a = 10 m	AC version	33 57 211 0105 001		
		DC version	33 57 211 0105 002		
	a = 20 m	AC version	33 57 211 0205 001		
		DC version	33 57 211 0205 002		
	a = 40 m	AC version	33 57 211 0405 001		
		DC version	33 57 211 0405 002		
	a = 50 m	AC version	33 57 211 0505 001		
		DC version	33 57 211 0505 002	Protection level: IP65 / IP67	
	a = 100 m	AC version	33 57 211 1005 001		
		DC version	33 57 211 1005 002		
Hybrid fibre optic cable, multi mode, single ended 2 x G50/125 + 3 x 2.5 mm²				single ended	
Length:	a = 1 m	AC version	33 57 111 0015 001		
		DC version	33 57 111 0015 002		
	a = 5 m	AC version	33 57 111 0055 001		
		DC version	33 57 111 0055 002	a = length	
	a = 10 m	AC version	33 57 111 0105 001		
		DC version	33 57 111 0105 002		
	a = 20 m	AC version	33 57 111 0205 001		
		DC version	33 57 111 0205 002		
	a = 40 m	AC version	33 57 111 0405 001		
		DC version	33 57 111 0405 002		
	a = 50 m	AC version	33 57 111 0505 001		
		DC version	33 57 111 0505 002		
	a = 100 m	AC version	33 57 111 1005 001		
		DC version	33 57 111 1005 002		
Hybrid fibre optic cable, multi mode, 50 µm					
	Length: 10 m		33 57 851 0100 002	PVC jacket	
	Length: 20 m		33 57 851 0200 002	2 x G50/125 + 3 x 2.5 mm²	
	Length: 500 m		33 57 851 5000 002	Outer diameter: 12.6 mm	
				Min. bending radius: single: 5 x OD repeated: 10 x OD	

Other cable lengths on request

Notes

System cable fibre optics

Features

- Connector types SCRJ
- Type of core POF, 980/1000 µm
- Number of cores 2
- Wiring Crossed
- Sheath material PUR

Advantages

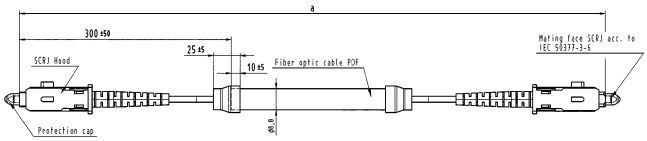
- Transmission of up to 100 Mbit/s
- Flexible, space saving
- Simple connection to switches and SPS/controller
- PROFINET compliant

Applications

- Industrial cabling
- Industrial automation
- Switchboard cabling

Other cable lengths on request

System cable fibre optics

Identification	Part number	Drawing	Dimensions in mm
SCRJ double ended Hood: plastic hood with top entry Cable: POF, multi mode, 980/1000 µm, PROFINET type C			
Length: a = 1 m	33 02 211 0010 001		
a = 2 m	33 02 211 0020 001		
a = 5 m	33 02 211 0050 001		
a = 10 m	33 02 211 0100 001		
a = 20 m	33 02 211 0200 001		

Other cable lengths on request

Han® PushPull SCRJ

Features

- Connector types: PushPull V14, SCRJ
- Type of core: POF, 980/1000 µm
- Number of cores: 2
- Wiring: Crossed
- Sheath material: PUR

Advantages

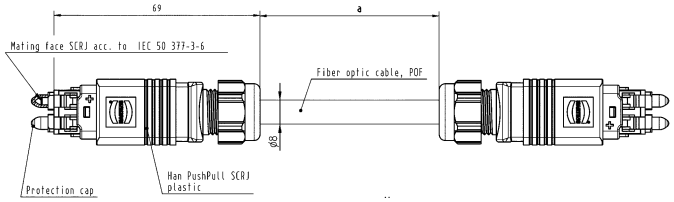
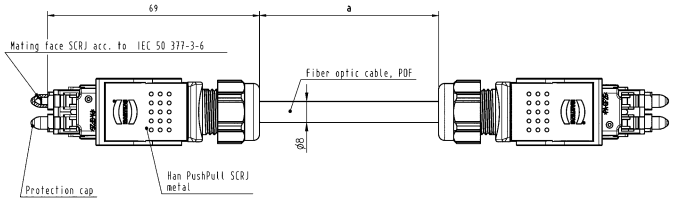
- Transmission of up to 100 Mbit/s
- Flexible, space saving
- Simple handling by HAN® PushPull
- PROFINET compliant

Applications

- Industrial cabling
- Industrial automation
- Outdoor installation

Other cable lengths on request

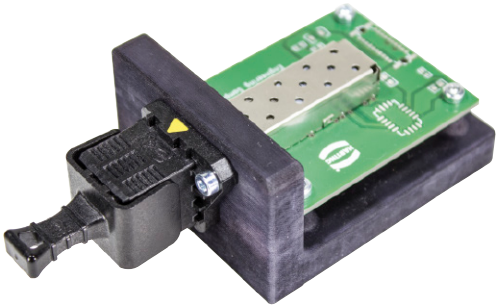
Han® PushPull SCRJ

Identification	Part number	Drawing	Dimensions in mm
Han® PushPull SCRJ double ended Hood: plastic with top entry Cable: POF, multi mode, 980/1000 µm, PROFINET type C Length: a = 1 m a = 2 m a = 5 m a = 10 m a = 20 m	33 53 211 0010 001 33 53 211 0020 001 33 53 211 0050 001 33 53 211 0100 001 33 53 211 0200 001		
Han® PushPull SCRJ double ended Hood: metal with top entry Cable: POF, multi mode, 980/1000 µm, PROFINET type C Length: a = 1 m a = 2 m a = 5 m a = 10 m a = 20 m	33 53 211 0010 002 33 53 211 0020 002 33 53 211 0050 002 33 53 211 0100 002 33 53 211 0200 002		

Other cable lengths on request

Notes

PushPull XS SFP



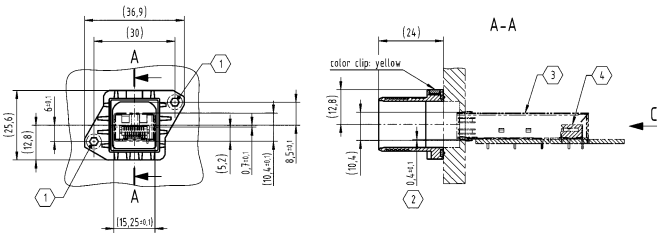
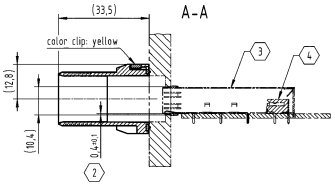
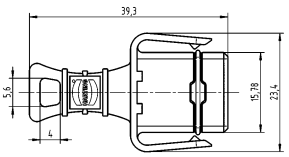
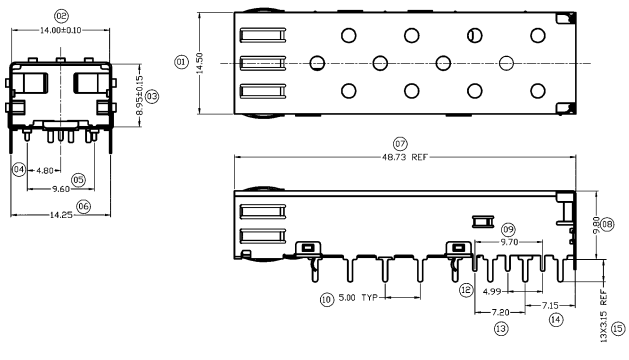
PushPull XS SFP
Device integration and system cable

Advantages

- Optical PushPull connector based on LC with small form factor (requires 50 % compared to SC and ST)
- Shortest, most compact cable solution equipped with SFP transceiver directly pluggable into the device (length of mated pair appr. 60 mm)
- Small installation pitch: 30 mm
- Multiple transceivers for LC and RJ45 can be used in the same port
- Blind mating capability

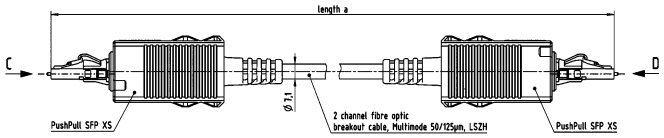
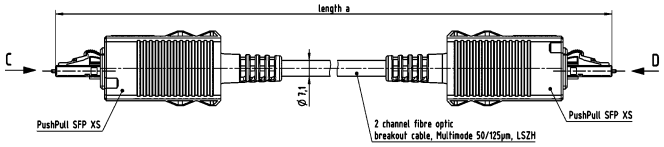
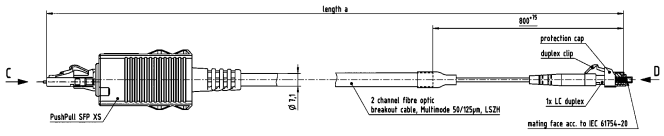
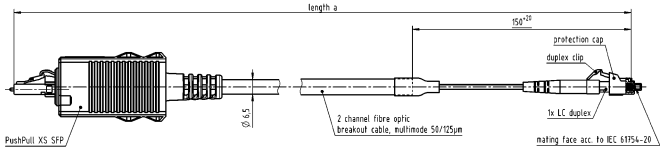
Technical characteristics

Locking	PushPull Technology
Degree of protection	IP65 / IP67
Mating face	LC acc. to IEC 61754-20
Mating cycles	Min. 50
Temperature range	-40 °C … +85 °C
Housing material	Plastic, black
Flammability acc. to UL 94	V0
XXX = length	001 = 1 m, 002 = 2 m … 010 = 10 m, 100 = 100 m
Available length 1 up to 15 m: in 1 m steps	20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100 m

Identification	Part number	Drawing	Dimensions in mm
Housing bulkhead mounting, short	09 57 411 0501 200[1]		
Housing bulkhead mounting, long	09 57 411 0501 201[2]		
Protection cover device side	09 57 411 0501 202		
SFP cage solder termination press in termination	33 11 000 0180 000 33 11 000 0179 000		

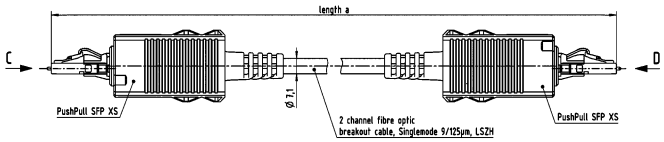
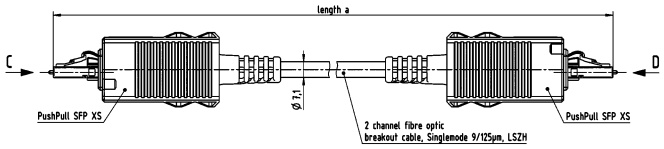
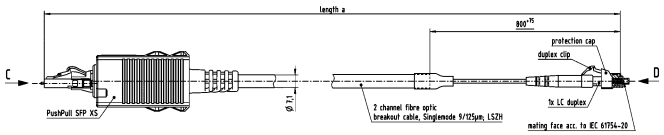
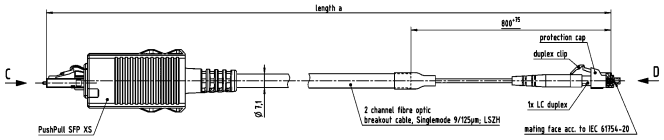
[1] Only for LC transceiver
[2] For LC and RJ45 transceiver

PushPull XS SFP
Device integration and system cable

Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable PUR jacket, multi mode, 50 µm, overmoulded 2 x PushPull XS	33 26 231 xxx0 012[1]		
Fibre optic cable PUR jacket, multi mode, 50 µm, overmoulded 2 x PushPull XS	33 26 231 xxx0 014[2]		
Fibre optic cable PUR jacket, multi mode, 50 µm, overmoulded 1 x PushPull XS 1 x LC duplex	33 26 231 xxx0 013[1]		
Fibre optic cable PUR jacket, multi mode, 50 µm, overmoulded 1 x PushPull XS 1 x LC duplex	33 26 231 xxx0 018[2]		

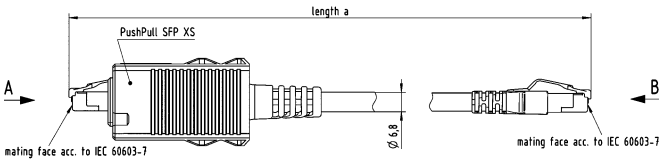
[1] For housing 09 57 411 0501 201
[2] For housing 09 57 411 0501 200

PushPull XS SFP
Device integration and system cable

Identification	Part number	Drawing	Dimensions in mm
Fibre optic cable PUR jacket, single mode, 9/125 µm, overmoulded 2 x PushPull XS	33 26 231 xxx0 011[1]		
Fibre optic cable PUR jacket, single mode, 9/125 µm, overmoulded 2 x PushPull XS	33 26 231 xxx0 015[2]		
Fibre optic cable PUR jacket, single mode, 9/125 µm, overmoulded 1 x PushPull XS 1 x LC duplex	33 26 231 xxx0 016[1]		
Fibre optic cable PUR jacket, single mode, 9/125 µm, overmoulded 1 x PushPull XS 1 x LC duplex	33 26 231 xxx0 017[2]		

[1] For housing 09 57 411 0501 201
[2] For housing 09 57 411 0501 200

PushPull XS SFP
Device integration and system cables

Identification	Part number	Drawing	Dimensions in mm
Cat. 6_A cable PVC jacket, overmoulded 1 x PushPull XS 1 x RJ45	33 25 231 xxx0 001		

List of part numbers

List of part numbers

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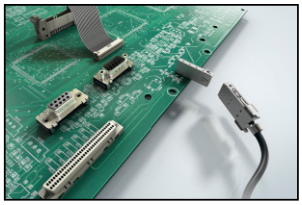
List of part numbers

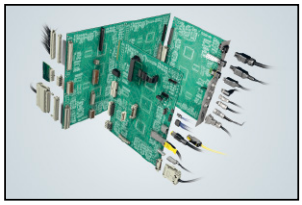
Notes

Catalogue order information

Please send me further information:

☐ 

Interface Connectors

☐ 

Device Connectivity

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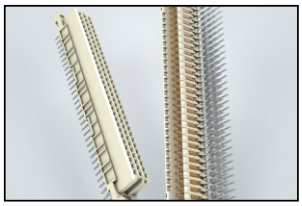
Industrial Connectors Han®

☐ 

Connectors DIN 41 612

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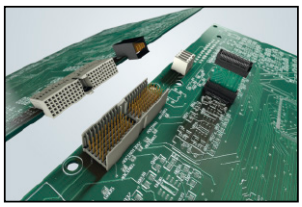
☐ 

Coaxial and Metric Connectors

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Application brochure

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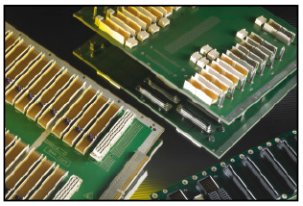
TCA Connectors

☐ 

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