

# 03. Circular Connectors



Circular connectors represent a widespread industrial standard for wiring sensors and actuators installed in the field. HARTING offers a portfolio of circular connectors with M8, M12, M 23, 7/8" thread and Han-Max® which are attuned to meet the requirements of industrial applications. In addition to the ready-to-use system cables, HARTING offers connectors equipped with HARAX® quick connection technology for in situ field assembly. In addition, HARTING is continuing the development of enhanced circular connectors for new applications. HARTING is offering the M12 connector for the electrical and optical cabling for Fast Ethernet applications.

### Application profile:

CONNECTION TYPE		ENVIRONMENT		APPLICATION						
Board to Board	Cable/Wire to Board	IP20	IP65 / IP67	Data	Signal	Power	high performance			
							Data transfer rate	Shielding	Number of contacts, contact density	Voltage, working current
Cable termination			PCB termination			Application standard				
Han-Quick Lock®	IDC HARAX®	Crimp	THT	SMC	SMT					
Screw			Press-in			Housing integration				
Cage clamp						Separate housing		Integrated housing		
Axial screw										

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Standardized circular connectors with M8, M12, M 23, 7/8“ thread and Han-Max® are in widespread use in the installation of machines and systems.

HARTING offers a portfolio of angled and straight M8, M12, Han® R 23 and 7/8” connectors which are attuned to meet all relevant automation requirements. The housings are available as plastic and as metal variant. In addition to the standard circular connectors for sensors/actuators, HARTING is offering standardized circular connectors such as the M12 and Han-Max® variants to meet the special requirements of communication technology (Ethernet, Ethernet/IP, PROFINET, PROFIBUS, Devicenet and CAN).

The HARTING product range comprises connectors, ready-to-use patch cables and corresponding accessories.

The easy-to-handle HARAX® quick connection technology is available for the in situ assembly of M8 and M12 connectors and does not require the use of special tools. The portfolio of circular connectors is rounded off by the Han® R 23 connector family. HARTING’s comprehensive and user-friendly circular connector range enables cost-effective and quick realization of all wiring and communication tasks in automation projects.

### APPLIANCE INTEGRATION:

In order to support the implementation of appliances with degree of protection IP65 / IP67, HARTING offers panel feed-through devices with ready-to use patch cables and female contact modules for direct mounting on PCBs.



## QUICK CONNECTION WITH HARAX®:

The HARTING HARAX® quick connection technology is an ideal solution for the in situ assembly of M8/M12 connectors. Users only have to strip the cable insulation, insert the conductors, and screw the connector together in order to produce a gas-proof and vibration resistant connection. HARAX® is a universal technology deployed in diverse connector series to wire data, signal and power lines and represents the current standard connection for Fieldbus and Fast Ethernet.



## ASSEMBLED SYSTEM CABLES:

HARTING offers a comprehensive range of ready-to-use M8/M12 system cables for the quick wiring of sensors and actuators. HARTING also offers ready-to-use and tested system cables for special Ethernet communication such as PROFINET and Ethernet/IP. HARTING also provides custom patch cables which are also available as overmoulded versions. The range of solutions comprises shielded and non-shielded cables with diverse structures, as required in drag chain applications, for example.



## M12 FEMALE SOCKETS FOR PCB MOUNTING:

Straight and angled contact inserts are available for direct soldering on PCBs. HARTING has developed special shielded contact inserts category 5 to ISO/IEC 11801 for Ethernet technology which meet the stringent requirements for railway applications.



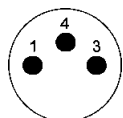


## Specifications

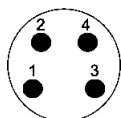
IEC 60352-4, IEC 61076-2-104, IEC 61076-2-101, IEC 61076-2-109,



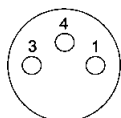
### M8 circular connectors, mating face acc. to IEC 61076-2-104



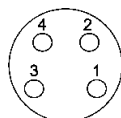
Male, 3 poles



Male, 4 poles



Female, 3 poles



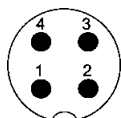
Female, 4 poles

### M12 circular connectors, mating face acc. to IEC 61076-2-101

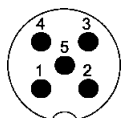
#### A-coding



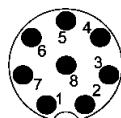
Male, 3 poles



Male, 4 poles



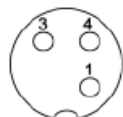
Male, 5 poles



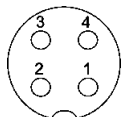
Male, 8 poles



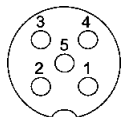
Male, 12 poles



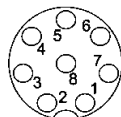
Female, 3 poles



Female, 4 poles



Female, 5 poles



Female, 8 poles

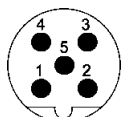


Female, 12 poles

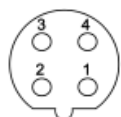
#### B-coding



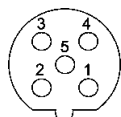
Male, 4 poles



Male, 5 poles

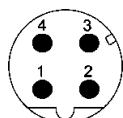


Female, 4 poles

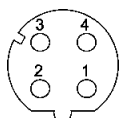


Female, 5 poles

#### D-coding

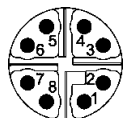


Male, 4 poles



Female, 4 poles

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

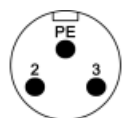


Male, 8 poles

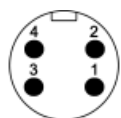


Female, 8 poles

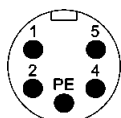
### 7/8"



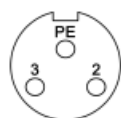
Male, 2 + PE



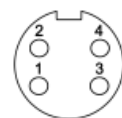
Male, 4 poles



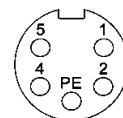
Male, 4 + PE



Female, 2 + PE

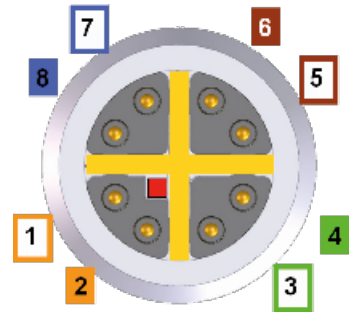


Female, 4 poles



Female, 4 + PE

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



8 poles pin assignment

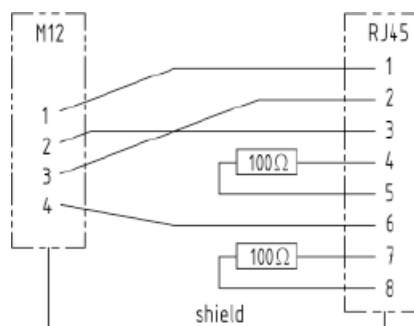
Signals		Pin assignment			Cable		
1/10Gbit	10/100 Mbit	RJ45	M12 D-coded	M12 X-coded	4-wire	568A	568B
BI_DA+	TxData+	1	1	1	yellow	white/green	white/orange
BI_DA-	TxData-	2	3	2	orange	green	orange
BI_DB+	RxData+	3	2	3	white	white/orange	white/green
BI_DC+	-	4	-	8		blue	blue
BI_DC-	-	5	-	7		white/blue	white/blue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

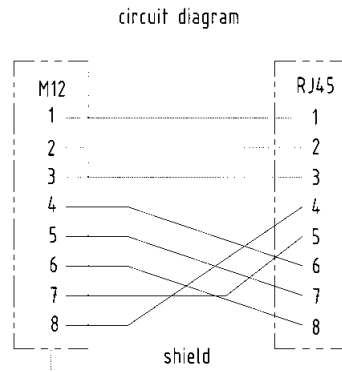
Stromlaufplan  
circuit diagram



## 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

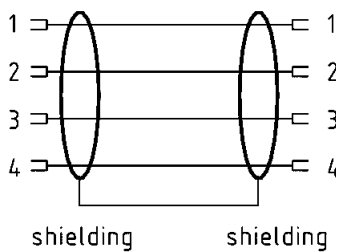


## Gender changer

4 poles



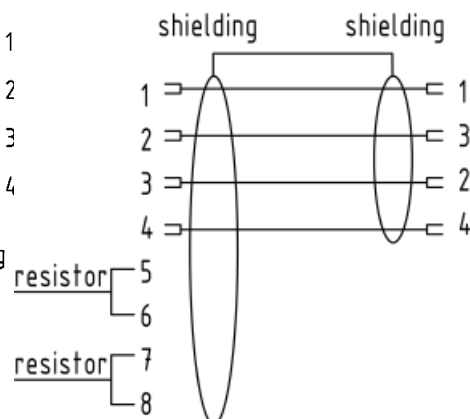
schematic diagram



4 poles / 8 poles



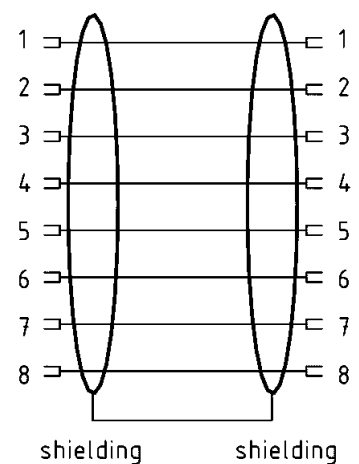
schematic diagram



8 poles



schematic diagram





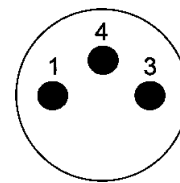
# M8 HARAX<sup>®</sup> cable connector



**Specifications** IEC 60352-4

**Approval** 

Mating face



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



## Technical characteristics M8 HARAX<sup>®</sup>

Type M8	HARAX <sup>®</sup> M8-XS	HARAX <sup>®</sup> M8-S
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### General data

Conductor cross section	0.1 - 0.14 mm <sup>2</sup> AWG 27-26	0.14 - 0.34 mm <sup>2</sup> AWG 26-22
Diameter of individual strands	≥ 0.05 mm	≥ 0.1 mm
Conductor insulation material	PVC / PP / TPE	PVC / PP / TPE
Conductor diameter	0.6 - 1.0 mm	1.0 - 1.6 mm
Cable diameter	1.9 - 2.5 mm 2.5 - 3.5 mm	2.5 - 5.1 mm
Temperature range	-40 °C ... +85 °C	-40 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C	-5 °C ... +50 °C
Degree of protection	IP67	IP67
Mating cycles	100	100
Recommended tightening torque / Hexagonal wrench	0.4 Nm / SW 9	0.4 Nm / SW 9

### Electrical characteristics

Rated current	2 A	4 A
Rated voltage	32 V	32 V
Rated impulse voltage	1.5 kV	1.5 kV
Contact resistance	10 mΩ	10 mΩ
Insulation resistance	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω
Pollution degree	3	3
Overvoltage category	3	3
Isolation group	1	1

### Materials

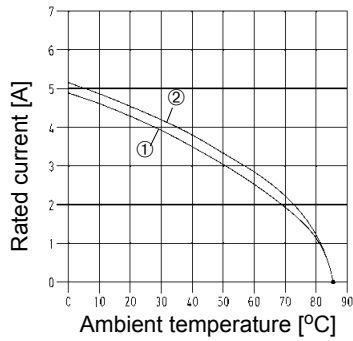
Contact material	Copper alloy	Copper alloy
Contact plating	Gold	Gold
Contact carrier material	PA	PA
Housing material	PA, zinc die-cast	PA, zinc die-cast

## Technical characteristics M8

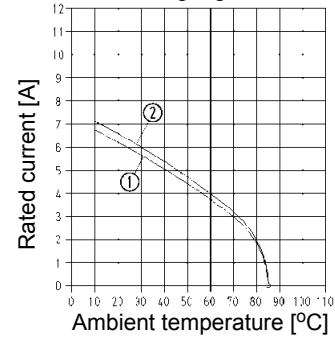
**Current carrying capacity** The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is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

Control and test procedures according to DIN IEC 60512-5.

M8-XS, 3 poles 1 = Wire gauge 0.1 mm<sup>2</sup>  
 M8-S, 3 poles 2 = Wire gauge 0.14 mm<sup>2</sup>



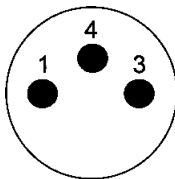
M8-S, 4 poles 1 = Wire gauge 0.25 mm<sup>2</sup>  
 2 = Wire gauge 0.34 mm<sup>2</sup>







Mating face



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



### Applications / Advantages

- Actor and sensor applications
- Unshielded versions
- HARAX® rapid termination
- Overmoulded system cables in various lengths
- Robust design, quick assembly

Identification

Part number

Drawing

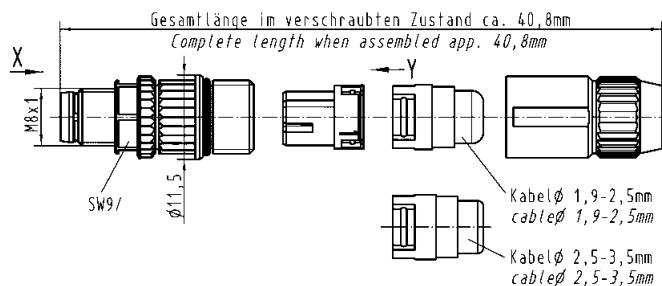
Dimensions in mm

HARAX® M8-XS



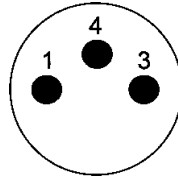
Male  
straight version, 3 poles  
for 0.1 - 0.14 mm<sup>2</sup>

21 02 159 1305





Mating face



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



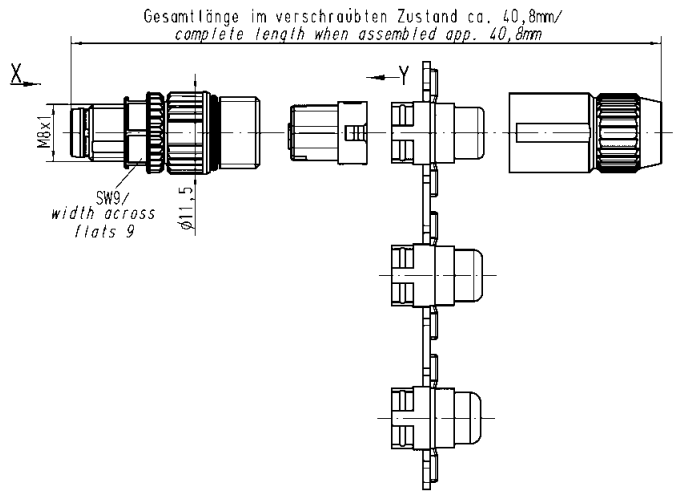
Identification	Part number	Drawing	Dimensions in mm
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**HARAX® M8-S**



Male  
straight version, 3 poles  
for 0.14 - 0.34 mm<sup>2</sup>

21 02 151 1305



Male  
straight version, 4 poles  
for 0.14 - 0.34 mm<sup>2</sup>

21 02 151 1405

View mating side:  
3 poles, male

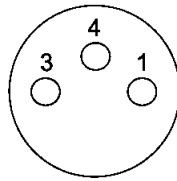


View mating side:  
4 poles, male





Mating face



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



Identification

Part number

Drawing

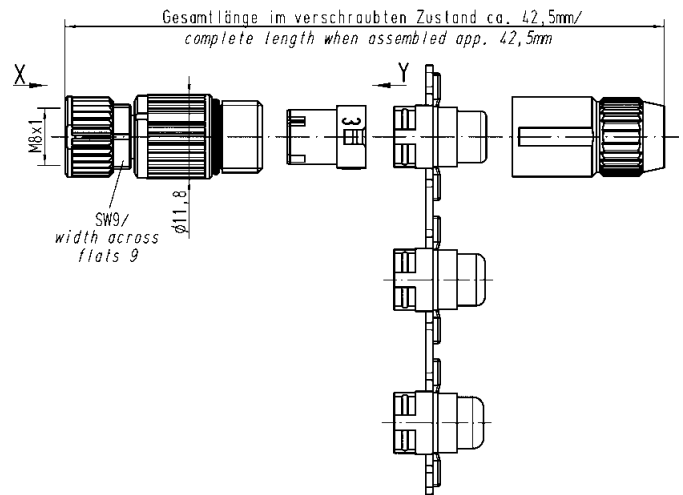
Dimensions in mm

HARAX® M8-S



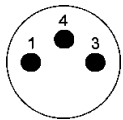
Female  
straight version, 3 poles  
for 0.14 - 0.34 mm<sup>2</sup>

21 02 151 2305

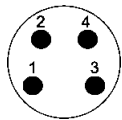


Female  
straight version, 4 poles  
for 0.14 - 0.34 mm<sup>2</sup>

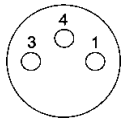
21 02 151 2405



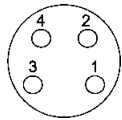
Male, 3 poles



Male, 4 poles



Female, 3 poles



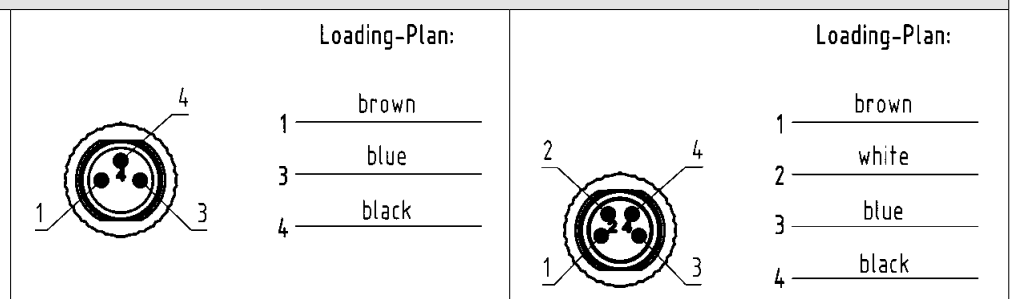
Female, 4 poles



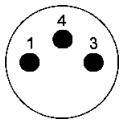
## Technical characteristics

System cables with M8 circular connectors without PE

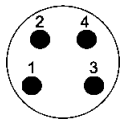
	3 poles		4 poles	
	PVC	PUR	PVC	PUR
Rated voltage	max. 60 V AC/DC	max. 60 V AC/DC	max. 30 V AC/DC	max. 30 V AC/DC
Rated current / contact	max. 3 A at +40 °C	max. 3 A at +40 °C	max. 3 A at +40 °C	max. 3 A at +40 °C
Screw locking	M8x1, self securing	M8x1, self securing	M8x1, self securing	M8x1, self securing
Recommended torque	0.4 Nm	0.4 Nm	0.4 Nm	0.4 Nm
Temperature range (working and storage)	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C
Degree of protection	IP67	IP67	IP67	IP67
Number of wires / wire gauge	3 x 0.25 mm <sup>2</sup>	3 x 0.25 mm <sup>2</sup>	3 x 0.25 mm <sup>2</sup>	3 x 0.25 mm <sup>2</sup>
Conductor insulation	PVC (bn, bu, bk)	PVC (bn, bu, bk)	PVC (bn, wh, bu, bk)	PVC (bn, wh, bu, bk)
Arrangement of insulated strands	32 x Ø 0.1 mm	32 x Ø 0.1 mm	32 x Ø 0.1 mm	32 x Ø 0.1 mm
Sheath	PVC	PUR (UL, CSA)	PVC	PUR (UL, CSA)
Sheath colour	grey	black	grey	black
Outer diameter	Ø 4.40 ± 0.15 mm	Ø 4.40 ± 0.15 mm	Ø 4.70 ± 0.15 mm	Ø 4.40 ± 0.15 mm
Useable as trailing cable	no	yes	no	yes
Halogen free acc. to	–	DIN VDE 0472 part 815	–	DIN VDE 0472 part 815
Flame retardant acc. to	DIN EN 60 332-2-2	cUL20549	DIN EN 60 332-2-2	cUL20549
Oil-resistant	–	–	–	–



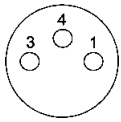
# M8 System cables 3 and 4 poles



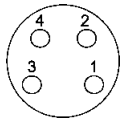
Male, 3 poles



Male, 4 poles



Female, 3 poles



Female, 4 poles



Circular Connectors

## Part number definition



### Connector 1

- 80 Male straight
- 81 Female straight
- 82 Male angled
- 83 Female angled

### Connector 2

- 00 No connector
- 80 Male straight
- 81 Female straight
- 82 Male angled
- 83 Female angled

### Number of contacts

- 3 3 poles
- 4 4 poles

### Cable material

- 80 PVC (3 poles)
- 81 PVC (4 poles)
- 88 PUR (3 poles)
- 89 PUR (4 poles)

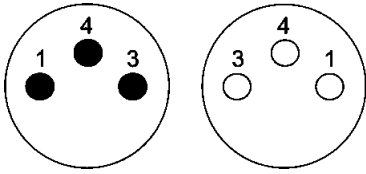
### Preferred length\*

- 005 0.5 m
- 010 1.0 m
- 015 1.5 m
- 020 2.0 m
- 050 5.0 m
- 075 7.5 m
- 100 10.0 m

\* Other length on request



Mating face



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



Identification

Part number

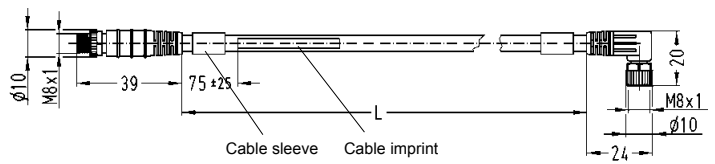
Drawing

Dimensions in mm

M8 Circular connectors

Female angled, with LED  
Male straight

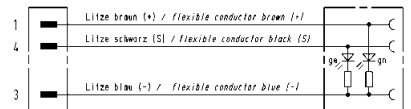
Length:	Part number
0.3 m	21 02 454 7301
0.6 m	21 02 454 7302
1.0 m	21 02 454 7303
1.5 m	21 02 454 7304
2.0 m	21 02 454 7305



View mating side



Schematic diagram

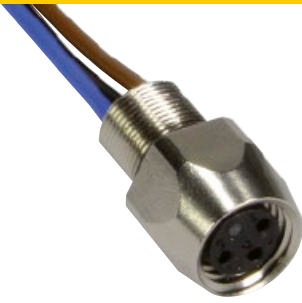




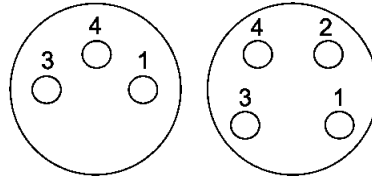
# M8 Panel feed-through



Circular Connectors



Mating face



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



Identification	Part number	Drawing	Dimensions in mm
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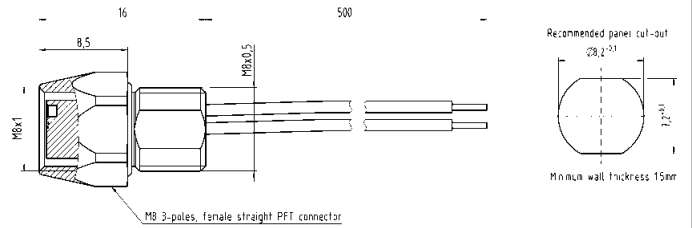
## M8 Panel feed-through



Female  
A-coding,  
50 cm conductors, 0.5 mm<sup>2</sup>, 3 poles

Panel thickness  
min. 1.5 mm

21 02 357 6305



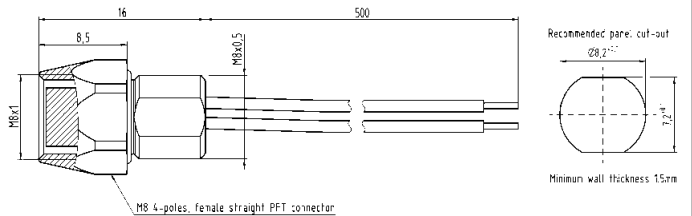
## M8 Panel feed-through


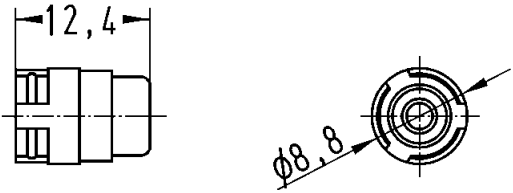

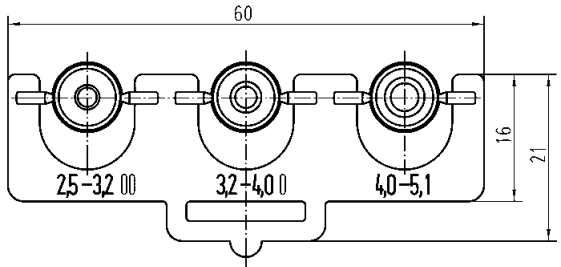



Female  
A-coding,  
50 cm conductors, 0.5 mm<sup>2</sup>, 4 poles

Panel thickness  
min. 1.5 mm

21 02 357 6405



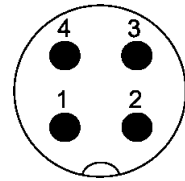
Identification	Part number	Drawing	Dimensions in mm
<p><b>Seal M8</b></p> <p>for 1.9 - 2.5 mm cable Ø for 2.5 - 3.5 mm cable Ø for 4.2 - 5.4 mm cable Ø</p> 	<p>21 01 010 2016 21 01 010 2008 21 01 010 2005</p>		
<p><b>Set of seals for HARAX® M8-S</b></p> <p>for 2.5 - 3.2 mm cable Ø for 3.2 - 4.0 mm cable Ø for 4.0 - 5.1 mm cable Ø</p> 	<p>21 01 010 2013</p>		
<p><b>M8 dynamometric screwdriver</b></p> <p>Tightening torque 0.4 Nm</p>	<p>SW 9      09 99 000 0380</p>		

**Specifications** IEC 60352-4

**Approval**



Mating face



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



## Technical characteristics M12 – A-coding

Type M12 A-coded	HARAX® M12-S	HARAX® M12 angled	HARAX® M12 L 3 poles, 4 poles
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### General data

Conductor cross section	0.14 - 0.34 mm <sup>2</sup> AWG 26-22	0.25 - 0.5 mm <sup>2</sup> AWG 24/7-20	0.34 - 0.75 mm <sup>2</sup> AWG 22-18
Diameter of individual strands	≥ 0.1 mm	≥ 0.1 mm	≥ 0.1 mm
Conductor insulation material	PVC / PP / TPE	PVC	PVC
Conductor diameter	1.0 - 1.6 mm	1.2 - 1.6 mm	1.6 - 2.0 mm 2.0 - 2.6 mm
Cable diameter	2.9 - 4.0 mm 4.0 - 5.1 mm	4 - 5.1 mm	6 - 8 mm
Temperature range	-40 °C ... +85 °C	-40 °C ... +85 °C	-40 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C	-5 °C ... +50 °C	-5 °C ... +50 °C
Degree of protection	IP67	IP67	IP65 / 67
Mating cycles	100	100	100
Tightening torque connector / hexagonal wrench	0.6 Nm / SW 13	0.6 Nm / SW 13	0.6 Nm / SW 17

### Electrical characteristics

Rated current	4 A	4 A	6 A
Rated voltage	32 V	32 V	50 V
Rated impulse voltage	1.5 kV	1.5 kV	1.5 kV
Contact resistance	10 mΩ	10 mΩ	10 mΩ
Insulation resistance	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω
Pollution degree	3	3	3
Overvoltage category	3	3	3
Isolation group	1	1	1

### Materials

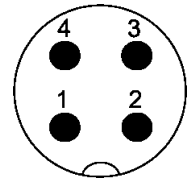
Contact material	Brass	Brass	Brass
Contact plating	Gold	Gold	Gold
Contact carrier material	PA reinforced	PA	PA unreinforced
Housing material	PA reinforced	PA	PA unreinforced

**Specifications** IEC 60352-4

**Approval**



Mating face



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

Circular Connectors

## Technical characteristics M12 – A-coding

Type M12 A-coded	HARAX® M12-L 5 poles	HARAX® M12 L shielded	M12 Crimp
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### General data

Conductor cross section	0.34 - 0.5 mm <sup>2</sup> AWG 22-20	0.14 - 0.34 mm <sup>2</sup> AWG 26-22	0.14 - 0.75 mm <sup>2</sup> AWG 26-18
Diameter of individual strands	≥ 0.1 mm	≥ 0.1 mm	X
Conductor insulation material	PVC	PVC	X
Conductor diameter	1.2 - 2.0 mm	1.2 - 1.6 mm	2.0 - 2.3 mm
Cable diameter	6 - 8 mm	4.5 - 8.8 mm	4.5 - 8.8 mm
Temperature range	-40 °C ... +85 °C	-40 °C ... +85 °C	-40 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C	-5 °C ... +50 °C	-5 °C ... +50 °C
Degree of protection	IP65 / 67	IP65 / 67	IP67
Mating cycles	100	100	500
Tightening torque connector / hexagonal wrench	0.6 Nm / SW 17	0.6 Nm / SW 17	0.5 Nm / SW 17

### Electrical characteristics

Rated current	4 A	4 A	4 A
Rated voltage	50 V	50 V	250 V
Rated impulse voltage	1.5 kV	1.5 kV	1.5 kV
Contact resistance	10 mΩ	10 mΩ	10 mΩ
Insulation resistance	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω
Pollution degree	3	3	3
Overvoltage category	3	3	3
Isolation group	1	1	1

### Materials

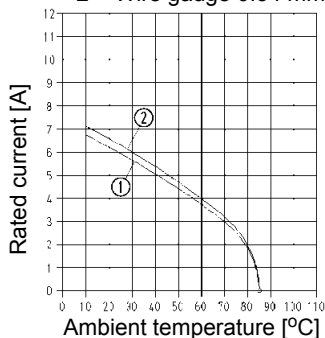
Contact material	Brass	Brass	Brass
Contact plating	Gold	Gold	Gold
Contact carrier material	PA unreinforced	PA unreinforced	PA
Housing material	PA unreinforced	PA unreinforced	PA

## Technical characteristics M12 – A-coding

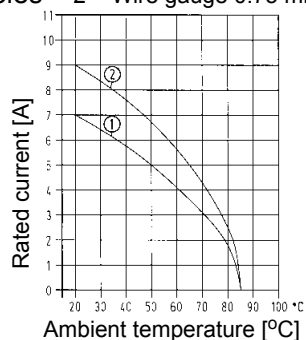
**Current carrying capacity** The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is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

Control and test procedures according to DIN IEC 60512-5.

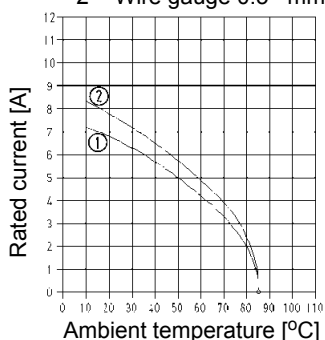
**M12-S, 4 poles** 1 = Wire gauge 0.25 mm<sup>2</sup>  
2 = Wire gauge 0.34 mm<sup>2</sup>



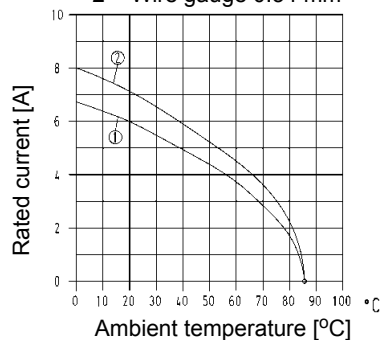
**M12-L** 3 poles, 4 poles 1 = Wire gauge 0.34 mm<sup>2</sup>  
2 = Wire gauge 0.75 mm<sup>2</sup>



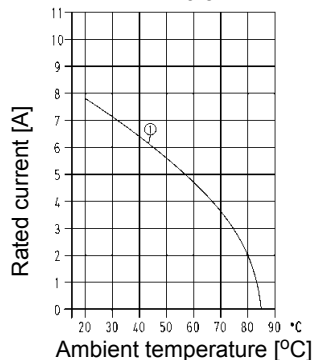
**M12, 4 poles, angled** 1 = Wire gauge 0.25 mm<sup>2</sup>  
2 = Wire gauge 0.5 mm<sup>2</sup>



**M12L, 5 poles** 1 = Wire gauge 0.25 mm<sup>2</sup>  
2 = Wire gauge 0.34 mm<sup>2</sup>

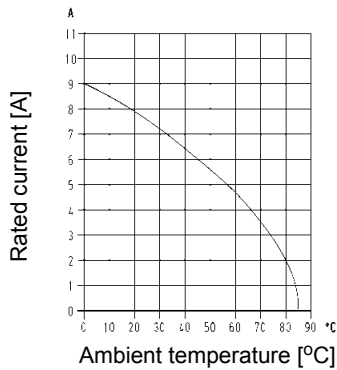


**M12, Crimp** 1 = Wire gauge 0.34 mm<sup>2</sup> /  
0.5 mm<sup>2</sup>

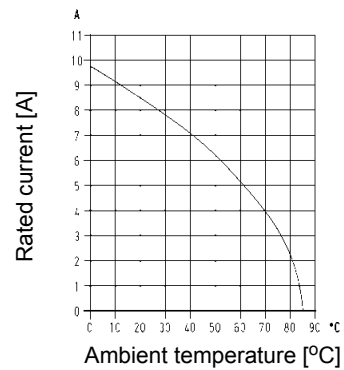


## Technical characteristics M12 – A-coding, PCB adapter

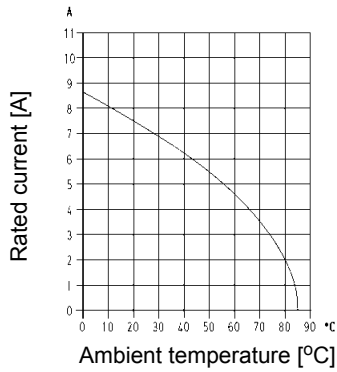
M12, A-coding, straight, male, 4 poles  
Wire gauge 0.5 mm<sup>2</sup>



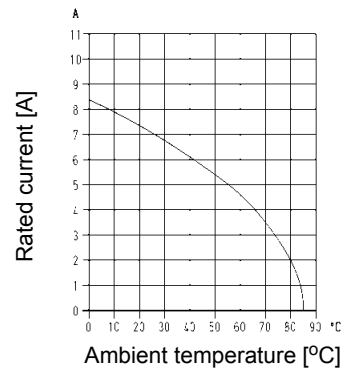
M12, A-coding, straight, female, 4 poles  
Wire gauge 0.75 mm<sup>2</sup>



M12, A-coding, straight, female, 5 poles  
Wire gauge 0.5 mm<sup>2</sup>



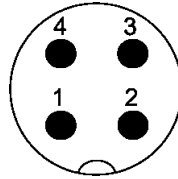
M12, A-coding, straight, male, 5 poles  
Wire gauge 0.5 mm<sup>2</sup>







Mating face


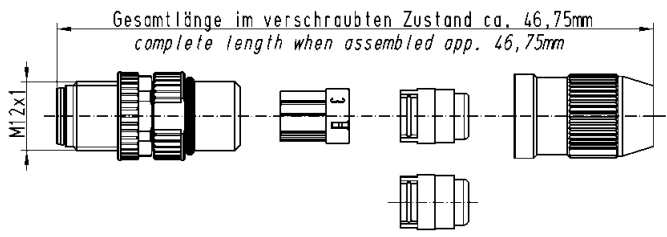
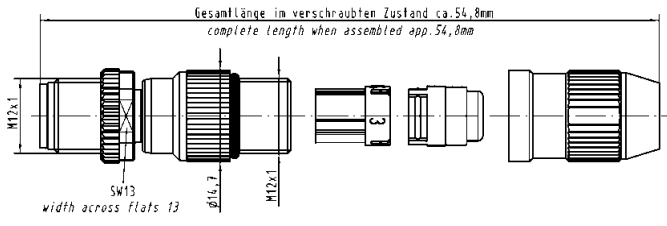


A-coding  
Mating face  
acc. to IEC 61076-2-101



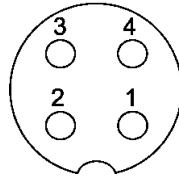
## Applications / Advantages

- Actor and sensor applications
- Shielded and unshielded versions
- Available with crimp resp. HARAX® rapid termination, or as overmoulded system cable in various lengths
- Robust design, quick assembly

Identification	Part number	Drawing	Dimensions in mm
<p><b>HARAX® M12-S</b></p>  <p>Male straight version 4 poles, 0.14 - 0.34 mm<sup>2</sup></p>	21 03 111 1405	 <p>Gesamtlänge im verschraubten Zustand ca. 46,75mm complete length when assembled app. 46,75mm</p>	
<p>Male straight version 4 poles, 0.25 - 0.5 mm<sup>2</sup></p>	21 03 112 1405	 <p>Gesamtlänge im verschraubten Zustand ca. 56,8mm complete length when assembled app. 56,8mm</p> <p>SW13 width across flats 13</p> <p>Ø16,7</p>	



Mating face



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



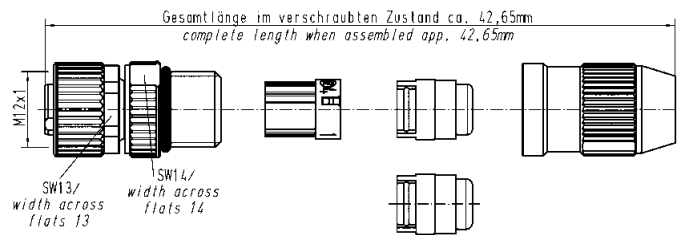
Identification	Part number	Drawing	Dimensions in mm
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**HARAX® M12-S**



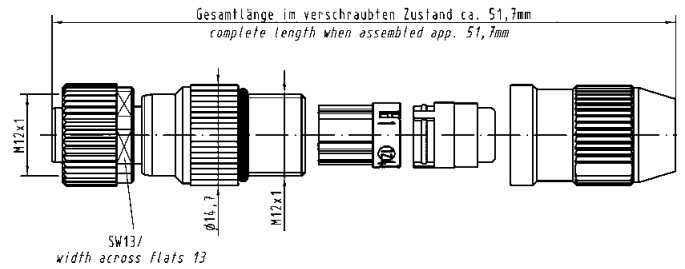
Female  
straight version  
4 poles, 0.14 - 0.34 mm<sup>2</sup>

21 03 111 2405



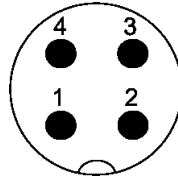
Female  
straight version  
4 poles, 0.25 - 0.5 mm<sup>2</sup>

21 03 112 2405





Mating face



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



Identification

Part number

Drawing

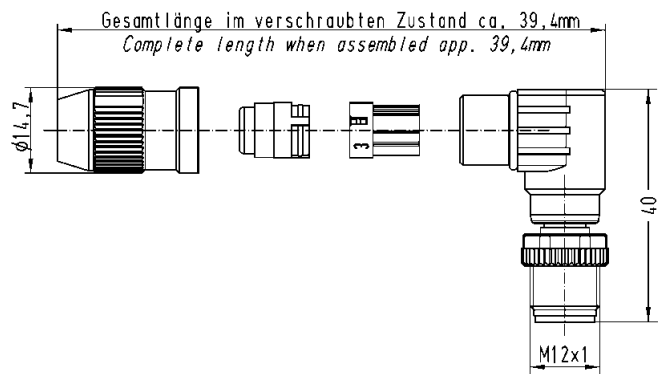
Dimensions in mm

HARAX® M12



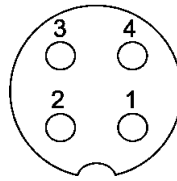
Male  
angled version  
4 poles

21 01 140 5081





Mating face



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



Identification

Part number

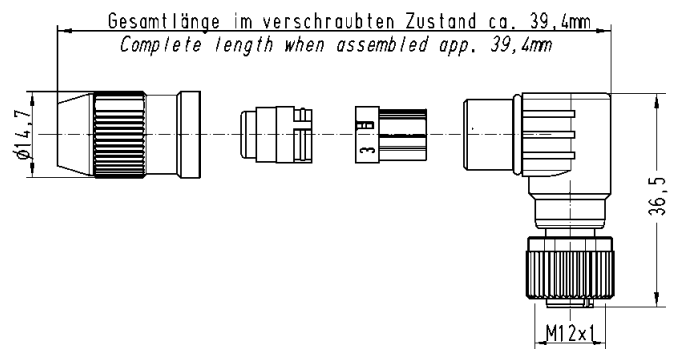
Drawing

Dimensions in mm

HARAX® M12



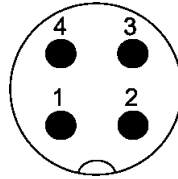
21 01 140 5091



Female  
angled version  
4 poles



Mating face



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



Circular Connectors

Identification	Part number	Drawing	Dimensions in mm
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## HARAX® M12-L, unshielded



Male  
3 poles, A-coding,  
with pre-leading contact  
(assignment 3, 4, 5)

21 03 212 1400

3 poles, A-coding  
(assignment 1, 3, 4)

21 03 212 1306

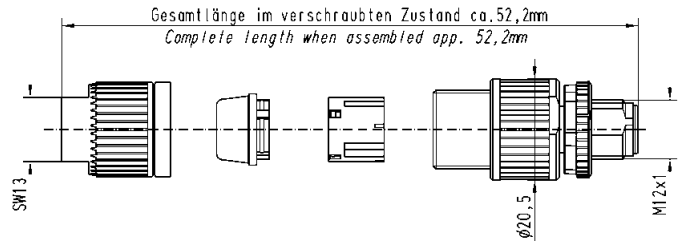
4 poles, A-coding  
(assignment 1, 2, 3, 4)

21 03 212 1305

4 poles, A-coding,  
to 2.6 mm core diameter  
(assignment 1, 2, 3, 4)

21 03 212 1407

0.34 - 0.75 mm<sup>2</sup>  
AWG 22 - 18  
Cable diameter: 6 - 8 mm



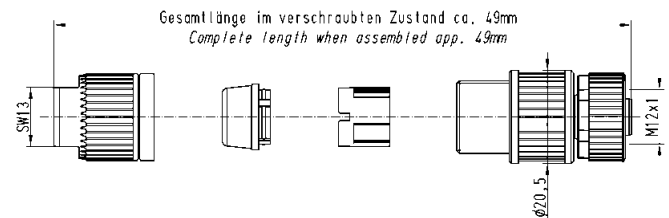
## HARAX® M12-L, unshielded



Male  
5 poles, A-coding

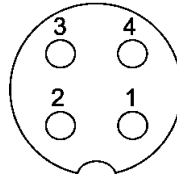
21 03 272 1505

0.34 - 0.5 mm<sup>2</sup>  
AWG 22 - 20  
Cable diameter: 6 - 8 mm





Mating face



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



Identification	Part number	Drawing	Dimensions in mm
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**HARAX® M12-L, unshielded**



Female  
3 poles, A-coding  
(assignment 3, 4, 5)

21 03 212 2400

3 poles, A-coding  
(assignment 1, 3, 4)

21 03 212 2306

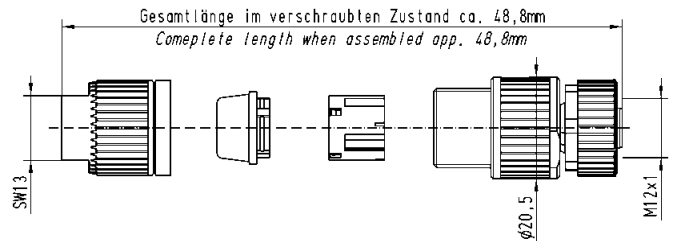
4 poles, A-coding  
(assignment 1, 2, 3, 4)

21 03 212 2305

4 poles, A-coding,  
to 2.6 mm core diameter  
(assignment 1, 2, 3, 4)

21 03 212 2407

0.34 - 0.75 mm<sup>2</sup>  
AWG 22 - 18  
Cable diameter: 6 - 8 mm



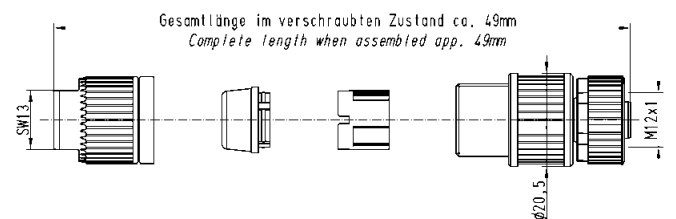
**HARAX® M12-L, unshielded**



Female  
5 poles, A-coding

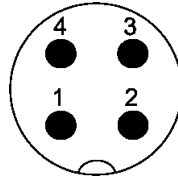
21 03 272 2505

0.34 - 0.5 mm<sup>2</sup>  
AWG 22 - 20  
Cable diameter: 6 - 8 mm





Mating face



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



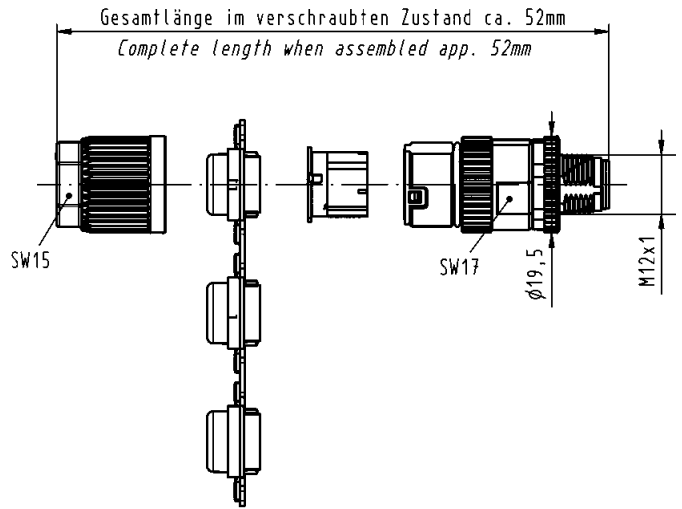
Identification	Part number	Drawing	Dimensions in mm
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**HARAX® M12-L, shielded**



Male  
4 poles, A-coding  
0.14 - 0.34 mm<sup>2</sup> / AWG 26 - 22

21 03 221 1405

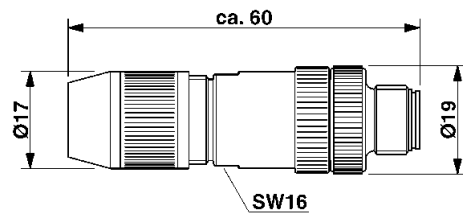


**M12 Circular connector**



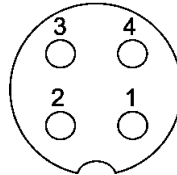
Male  
with IDC termination technology,  
8 poles  
0.14 - 0.34 mm<sup>2</sup> / AWG 26 - 22

21 03 121 1801





Mating face



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



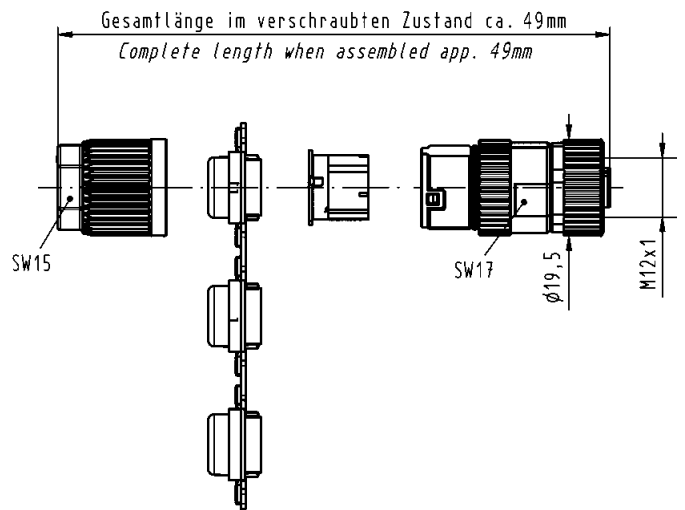
Identification	Part number	Drawing	Dimensions in mm
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**HARAX® M12-L, shielded**



Female  
4 poles, A-coding  
0.14 - 0.34 mm<sup>2</sup> / AWG 26 - 22

21 03 221 2405

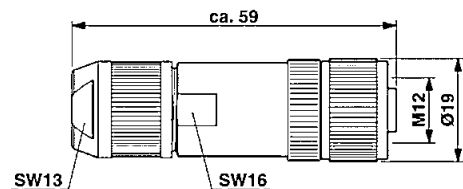


**M12 Circular connectors**



Female  
with IDC termination technology,  
8 poles  
0.14 - 0.34 mm<sup>2</sup> / AWG 26 - 22

21 03 121 2801



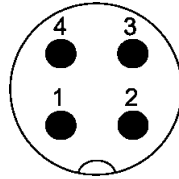




# M12 Crimp A-coded



Mating face



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



Circular  
Connectors

Identification

Part number

Drawing

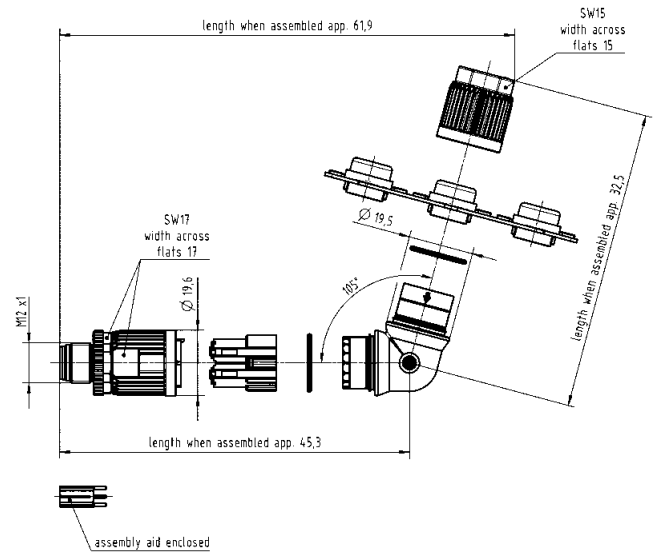
Dimensions in mm

M12 Crimp, angled



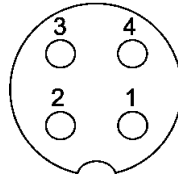
Male  
5 poles, A-coding

21 03 822 3505\*





Mating face



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



Identification

Part number

Drawing

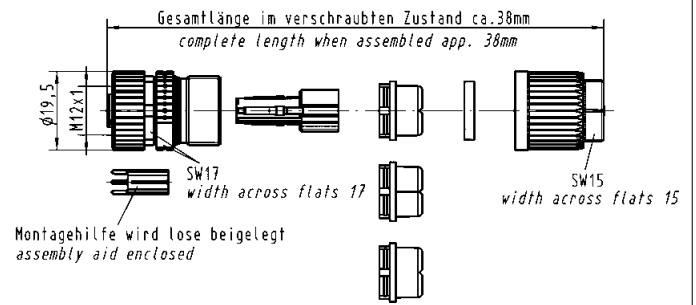
Dimensions in mm

M12 Crimp



Female  
4 poles, A-coding

21 03 812 2405

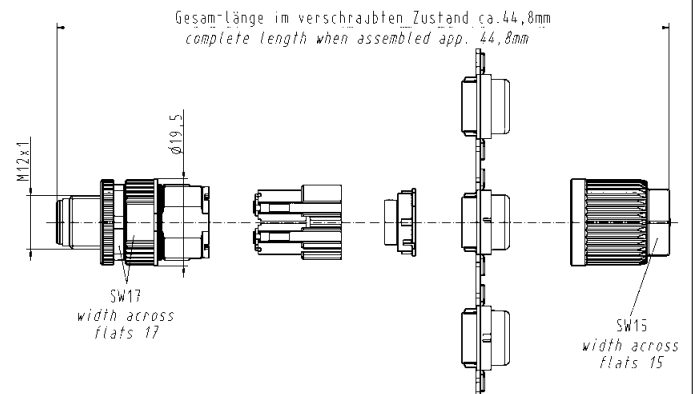


M12 Crimp



Female  
5 poles, A-coding

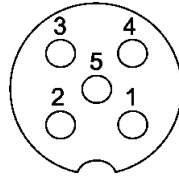
21 03 812 2505\*



# M12 Crimp A-coded



Mating face



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



Circular  
Connectors

Identification

Part number

Drawing

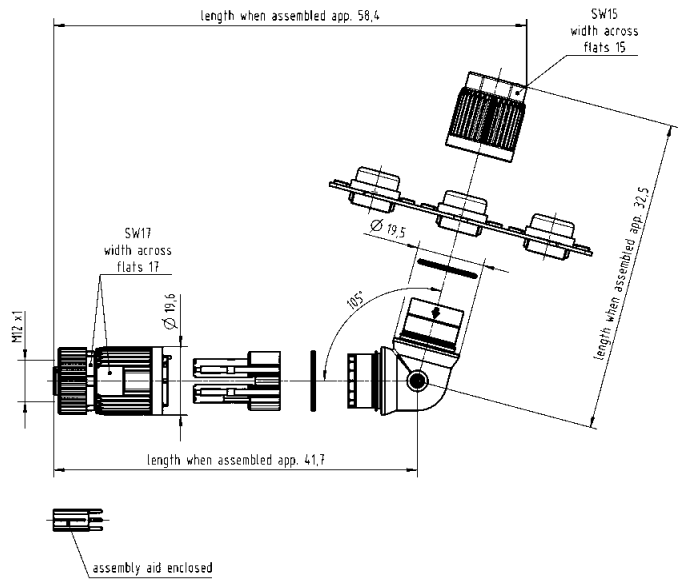
Dimensions in mm

M12 Crimp, angled



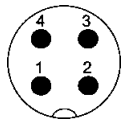
Female  
5 poles, A-coding

21 03 822 4505\*





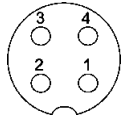
Male, 3 poles



Male, 4 poles



Female, 3 poles



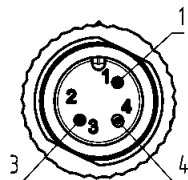
Female, 4 poles



## Technical characteristics

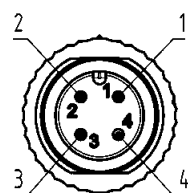
System cables with M12 circular connectors without PE, A-coding

	3 poles		4 poles	
	PVC	PUR	PVC	PUR
Rated voltage	max. 250 V AC/DC	max. 250 V AC/DC	max. 250 V AC/DC	max. 250 V AC/DC
Rated current / contact	max. 4 A at +40 °C	max. 4 A at +40 °C	max. 4 A at +40 °C	max. 4 A at +40 °C
Screw locking	M12x1, self securing	M12x1, self securing	M12x1, self securing	M12x1, self securing
Recommended torque	0.6 Nm	0.6 Nm	0.6 Nm	0.6 Nm
Temperature range (working and storage)	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C
Degree of protection	IP67	IP67	IP67	IP67
Number of wires / wire gauge	3 x 0.34 mm <sup>2</sup>	3 x 0.34 mm <sup>2</sup>	4 x 0.34 mm <sup>2</sup>	4 x 0.34 mm <sup>2</sup>
Conductor insulation	PVC (bn, bu, bk)	PP (bn, bu, bk)	PVC (bn, wh, bu, bk)	PP (bn, wh, bu, bk)
Arrangement of insulated strands	42 x Ø 0.1 mm	42 x Ø 0.1 mm	42 x Ø 0.1 mm	42 x Ø 0.1 mm
Sheath	PVC	PUR (UL, CSA)	PVC	PUR (UL, CSA)
Sheath colour	grey	black	grey	black
Outer diameter	Ø 4.4 ± 0.15 mm	Ø 4.4 ± 0.15 mm	Ø 4.7 ± 0.15 mm	Ø 4.7 ± 0.15 mm
Useable as trailing cable	no	yes	no	yes
Halogen free acc. to	–	DIN VDE 0472 part 815	–	DIN VDE 0472 part 815
Flame retardant acc. to	DIN EN 60332-2-2	cUL20549	DIN EN 60332-2-2	cUL20549
Oil-resistant	–	–	–	DIN EN 60811-2-1



Loading-Plan:

- 1 brown
- 2 blue
- 3 black



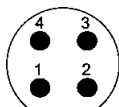
Loading-Plan:

- 1 brown
- 2 white
- 3 blue
- 4 black

# M12 System cables, A-coding, 3 and 4 poles



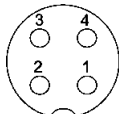
Male, 3 poles



Male, 4 poles



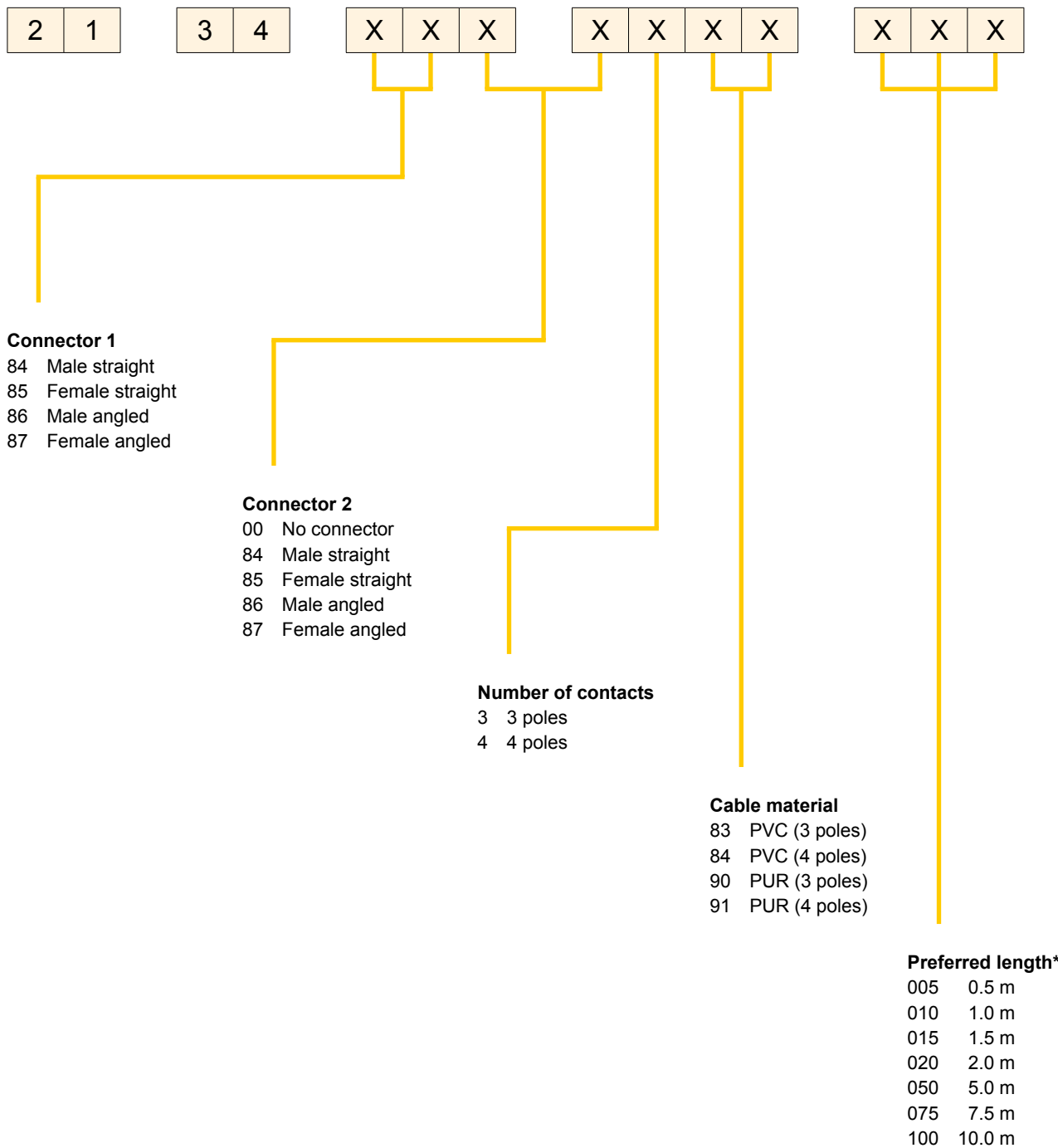
Female, 3 poles



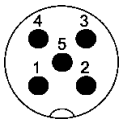
Female, 4 poles



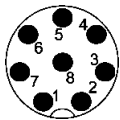
## Part number definition



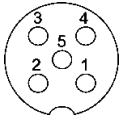
\* Other length on request



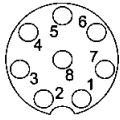
Male, 5 poles



Male, 8 poles



Female, 5 poles



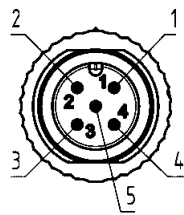
Female, 8 poles



## Technical characteristics

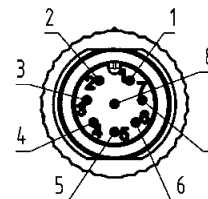
System cables with M12 circular connectors without PE, A-coding

	5 poles	8 poles
	PVC	PVC
Rated voltage	max. 60 V AC/DC	max. 30 V AC/DC
Rated current / contact	max. 4 A at +40 °C	max. 2 A at +40 °C
Screw locking	M12x1, self securing	M12x1, self securing
Recommended torque	0.6 Nm	0.6 Nm
Temperature range (working and storage)	-30 °C ... +80 °C	-30 °C ... +80 °C
Degree of protection	IP67	IP67
Number of wires / wire gauge	5 x 0.34 mm <sup>2</sup>	8 x 0.25 mm <sup>2</sup>
Conductor insulation	PVC (bn, wh, bu, bk, gn/ye)	PVC (wh, bn, gn, ye, gy, pk, bu, rd)
Arrangement of insulated strands	42 x Ø 0.1 mm	32 x Ø 0.1 mm
Sheath	PVC	PVC
Sheath colour	grey	grey
Outer diameter	Ø 5.2 ± 0.15 mm	Ø 6.2 ± 0.2 mm
Useable as trailing cable	no	no
Halogen free acc. to	-	-
Flame retardant acc. to	DIN EN 60332-2-2	DIN EN 60332-2-2
Oil-resistant	-	-



Loading-Plan:

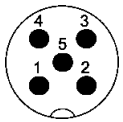
- 1 — brown
- 2 — white
- 3 — blue
- 4 — black
- 5 — green-yellow



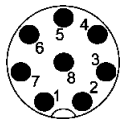
Loading-Plan:

- 1 — white
- 2 — brown
- 3 — green
- 4 — yellow
- 5 — grey
- 6 — pink
- 7 — blue
- 8 — red

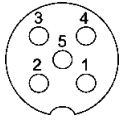
# M12 System cables, A-coding, 5 and 8 poles



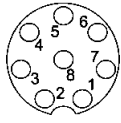
Male, 5 poles



Male, 8 poles



Female, 5 poles



Female, 8 poles



Circular Connectors

## Part number definition



- Connector 1**
- 84 Male straight
  - 85 Female straight
  - 86 Male angled
  - 87 Female angled

- Connector 2**
- 00 No connector
  - 84 Male straight
  - 85 Female straight
  - 86 Male angled
  - 87 Female angled

- Number of contacts**
- 5 5 poles
  - 8 8 poles

- Cable material**
- 82 PVC (8 poles)
  - 85 PVC (5 poles)

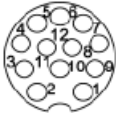
- Preferred length\***
- 005 0.5 m
  - 010 1.0 m
  - 015 1.5 m
  - 020 2.0 m
  - 050 5.0 m
  - 075 7.5 m
  - 100 10.0 m

\* Other length on request





Male, 12 poles



Female, 12 poles

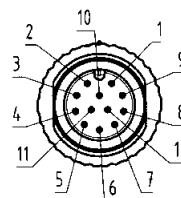


## Technical characteristics

System cables with M12 circular connectors without PE, A-coding

	12 poles	
	PVC	PUR
Rated voltage	max. 30 V AC/DC	max. 30 V AC/DC
Rated current / contact	max. 1.5 A at +40 °C	max. 1.5 A at +40 °C
Screw locking	M12x1, self securing	M12x1, self securing
Recommended torque	0.6 Nm	0.6 Nm
Temperature range (working and storage)	-30 °C ... +80 °C	-30 °C ... +80 °C
Degree of protection	IP67	IP67
Number of wires / wire gauge	12 x 0.14 mm <sup>2</sup>	12 x 0.14 mm <sup>2</sup>
Conductor insulation	PVC (core: vt, rd/bu, gy/pk outer: bn, rd, gy, bk, ye, pk, gn, wh, bu)	PP (core: vt, rd/bu, gy/pk outer: bn, rd, gy, bk, ye, pk, gn, wh, bu)
Arrangement of insulated strands	18 x Ø 0.1 mm	18 x Ø 0.1 mm
Sheath	PVC	PUR (UL, CSA)
Sheath colour	grey	black
Outer diameter	Ø 6.2 ± 0.2 mm	Ø 6.1 ± 0.2 mm
Useable as trailing cable	no	yes
Halogen free acc. to	-	DIN VDE 0472 part 815
Flame retardant acc. to	DIN EN 60332-1-2	cUL20549
Oil-resistant	DIN EN 60811-2-1	-

Loading-Plan:

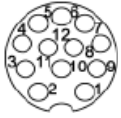


- 1 brown
- 2 blue
- 3 white
- 4 green
- 5 pink
- 6 yellow
- 7 black
- 8 grey
- 9 red
- 10 violet
- 11 grey-pink
- 12 red-blue

# M12 System cables, A-coding, 12 poles



Male, 12 poles



Female, 12 poles



## Part number definition



- Connector 1**
- 84 Male straight
  - 85 Female straight
  - 86 Male angled
  - 87 Female angled

- Connector 2**
- 00 No connector
  - 84 Male straight
  - 85 Female straight
  - 86 Male angled
  - 87 Female angled

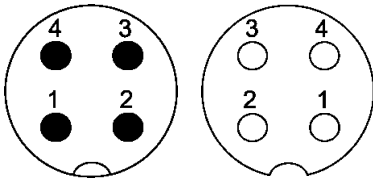
**Number of contacts**  
C 12 poles

- Cable material**
- 78 PUR
  - 79 PVC

- Preferred length\***
- 005 0.5 m
  - 010 1.0 m
  - 015 1.5 m
  - 020 2.0 m
  - 050 5.0 m
  - 075 7.5 m
  - 100 10.0 m

\* Other length on request

Mating face



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



Identification

Part number

Drawing

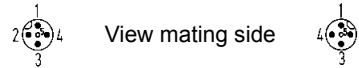
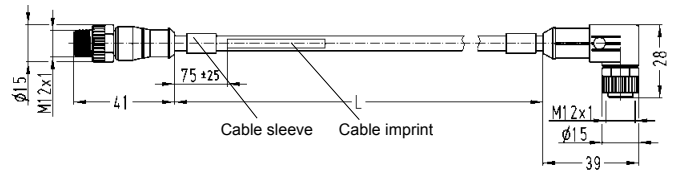
Dimensions in mm

M12 Circular connectors

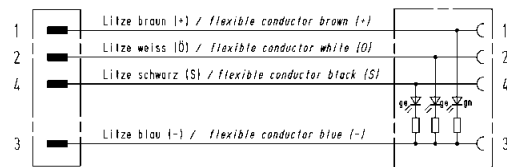
Female angled, with LED,  
Male straight

Length: 0.3 m  
0.6 m  
1.0 m  
1.5 m  
2.0 m

21 03 415 7401  
21 03 415 7402  
21 03 415 7403  
21 03 415 7404  
21 03 415 7405



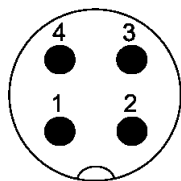
Schematic diagram







Mating face


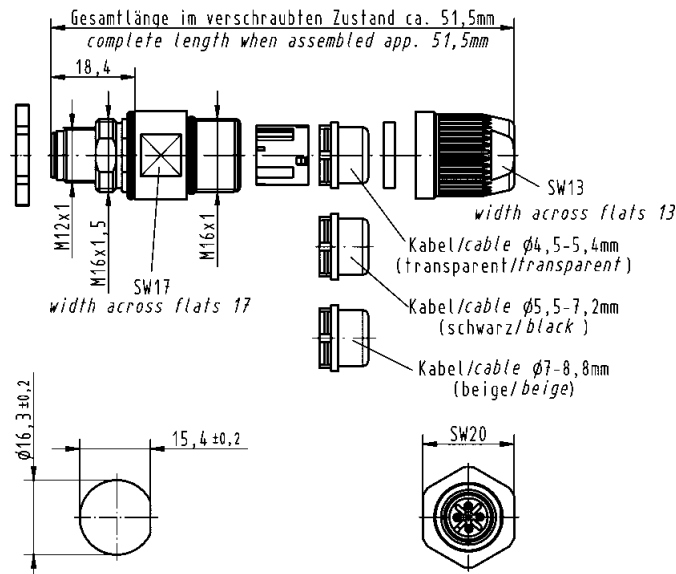


A-coding  
Mating face  
acc. to IEC 61076-2-101



## Applications / Advantages

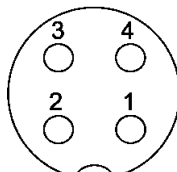
- Actor and sensor applications
- For panel feed-through or PCB, straight version in IP20 or IP67, with or without assembled pigtail
- Available with crimp resp. HARAX® rapid termination
- Quick and easy assembly

Identification	Part number	Drawing	Dimensions in mm
<p><b>HARAX® Panel feed-through</b></p>  <p>Male 4 poles, A-coding 0.14 - 0.34 mm<sup>2</sup> / AWG 26 - 22</p> <p>Panel thickness min. 2.5 mm max. 4.5 mm</p>	<p>21 03 321 1425</p>	 <p>Gesamtlänge im verschraubten Zustand ca. 51,5mm complete length when assembled app. 51,5mm</p> <p>18,4</p> <p>M12x1 M16x1,5 M16x1</p> <p>SW17 width across flats 17</p> <p>SW13 width across flats 13</p> <p>Kabel/cable <math>\phi</math>4,5-5,4mm (transparent/transparent)</p> <p>Kabel/cable <math>\phi</math>5,5-7,2mm (schwarz/black)</p> <p>Kabel/cable <math>\phi</math>7-8,8mm (beige/beige)</p> <p>SW20</p> <p><math>\phi</math>16,3 <math>\pm</math>0,2</p> <p>15,4 <math>\pm</math>0,2</p>	

# M12 Panel feed-through HARAX® A-coded



Mating face



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



Circular  
Connectors

Identification

Part number

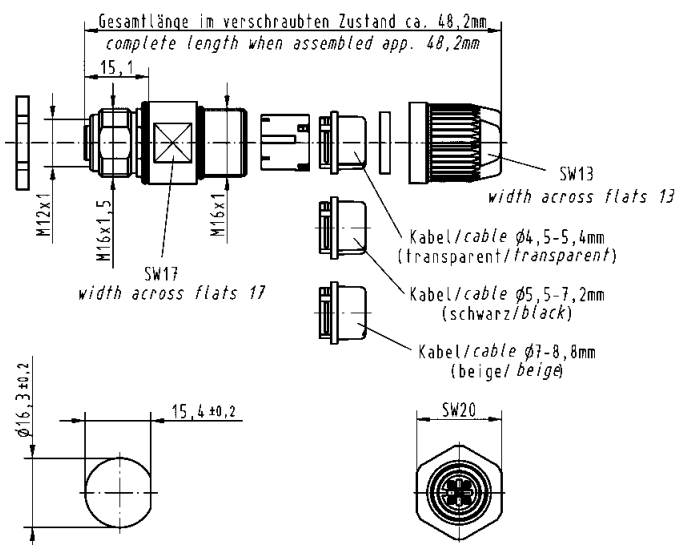
Drawing

Dimensions in mm

HARAX® Panel feed-through



21 03 321 2425



Female  
4 poles, A-coding  
0.14 - 0.34 mm<sup>2</sup> / AWG 26 - 22

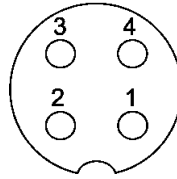
Panel thickness  
min. 2.5 mm  
max. 4.5 mm



# M12 Panel feed-through Crimp A-coded



Mating face



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



Circular  
Connectors

Identification

Part number

Drawing

Dimensions in mm

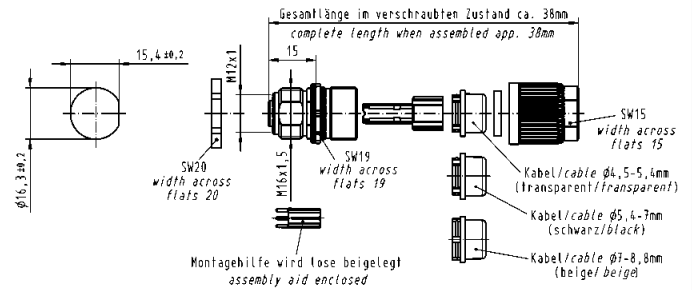
M12 Panel feed-through Crimp



Female  
4 poles, A-coding

Panel thickness  
min. 2.5 mm  
max. 4.5 mm

21 03 822 2425



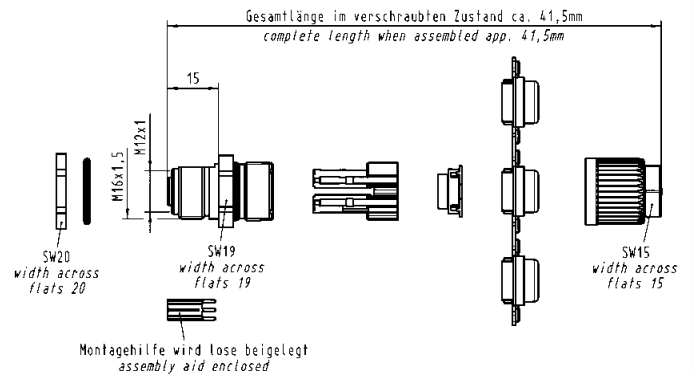
M12 Panel feed-through Crimp



Female  
5 poles, A-coding

Panel thickness  
min. 2.5 mm  
max. 4.5 mm

21 03 822 2525\*



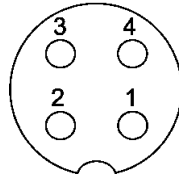




# M12 Panel feed-through A-coded




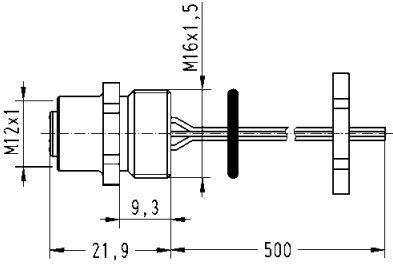
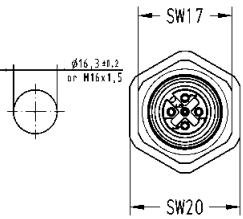

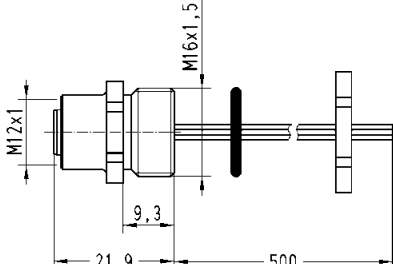
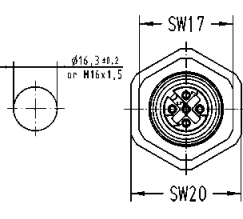
Mating face



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



Circular  
Connectors

Identification	Part number	Drawing	Dimensions in mm
<p>M12 Panel feed-through</p>  <p>Female A-coding, 50 cm conductors, 0.5 mm<sup>2</sup>, 4 poles</p> <p>Panel thickness min. 2.0 mm max. 5.0 mm</p>	<p>21 03 311 2400</p>		
<p>M12 Panel feed-through</p>  <p>Female A-coding, 50 cm conductors, 0.5 mm<sup>2</sup>, 5 poles</p> <p>Panel thickness min. 2.0 mm max. 5.0 mm</p>	<p>21 03 311 2501</p>		






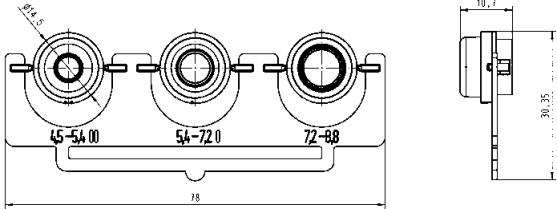

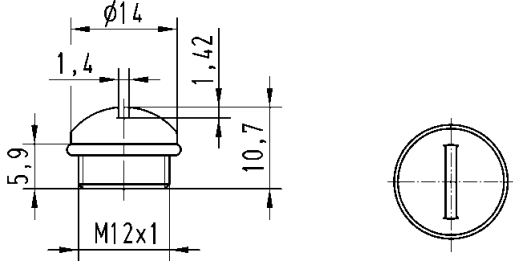






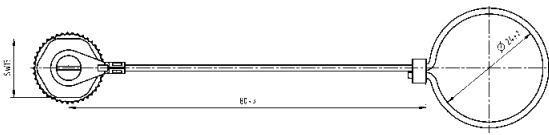

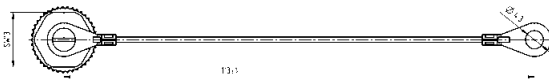

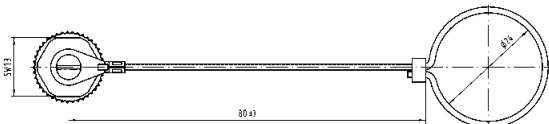

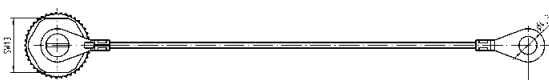






Identification	Part number	Drawing	Dimensions in mm
<p><b>Seal M12-S</b> for 2.9 - 4.0 mm cable Ø for 4 - 5.1 mm cable Ø</p> 	<p>21 01 010 2011 21 01 010 2001</p>		
<p><b>Seal M12-L unshielded</b> for 4.7 - 6 mm cable Ø for 6 - 8 mm cable Ø</p> 	<p>21 01 010 2015 21 01 010 2007</p>		
<p><b>Set of seals M12-L shielded</b> for 4.5 - 5.4 mm cable Ø for 5.4 - 7.2 mm cable Ø for 7.2 - 8.8 mm cable Ø</p> 	<p>21 01 010 2017</p>		
<p><b>Cap M12</b> for IP65 / 67 Seals material Viton Plastic cap for female</p> 	<p>21 01 000 0003</p>		
<p><b>Accessories M12</b></p> <p><b>Lock nut</b></p>	<p>21 01 000 0018</p>		



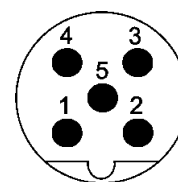
Identification	Part number	Drawing	Dimensions in mm
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for male side with cord</p> 	<p>21 01 000 0033</p>		
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for male side with cable clip</p> 	<p>21 01 000 0038</p>		
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for female side with cord</p> 	<p>21 01 000 0030</p>		
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for female side with cable clip</p> 	<p>21 01 000 0031</p>		



**Specifications** IEC 60352-4

**Approval**

Mating face



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



## Technical characteristics M12 – B-coding

Type M12 B-coded	HARAX® M12 L shielded	M12 Crimp
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### General data

Conductor cross section	0.25 - 0.34 mm <sup>2</sup> AWG 24-22	0.13 - 0.75 mm <sup>2</sup> AWG 26-18
Diameter of individual strands	≥ 0.1 mm	X
Conductor insulation material	PVC, Zell-PE	X
Conductor diameter	2 - 2.6 mm	2.0 - 2.3 mm
Cable diameter	7.0 - 8.8 mm	4 poles: 4.5 - 8.8 mm 5 poles: 4.5 - 8.8 mm
Temperature range	-40 °C ... +85 °C	-40 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C	-5 °C ... +50 °C
Degree of protection	IP65 / 67	IP67
Mating cycles	100	500
Tightening torque connector / hexagonal wrench	0.6 Nm / SW 17	0.5 Nm / SW 17

### Electrical characteristics

Rated current	4 A	4 A
Rated voltage	32 V	250 V
Rated impulse voltage	1.5 kV	1.5 kV
Contact resistance	10 mΩ	10 mΩ
Insulation resistance	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω
Pollution degree	3	3
Overvoltage category	3	3
Isolation group	1	1

### Materials

Contact material	Brass	Brass
Contact plating	Gold	Gold
Contact carrier material	PA unreinforced	PA
Housing material	PA unreinforced	PA

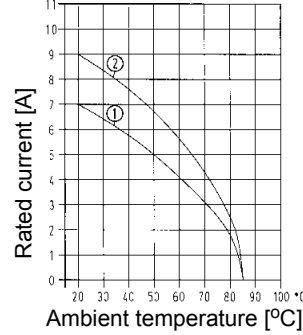
## Technical characteristics M12 – B-coding

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

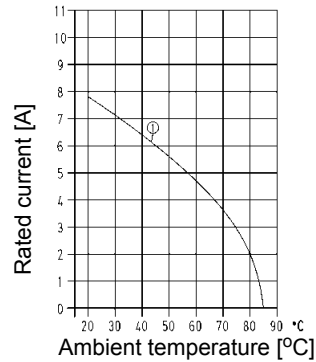
Control and test procedures according to DIN IEC 60512-5.

M12-L  
3 poles, 4 poles

1 = Wire gauge 0.34 mm<sup>2</sup>  
2 = Wire gauge 0.75 mm<sup>2</sup>

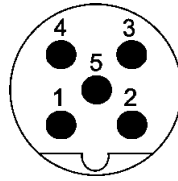


M12, Crimp 1 = Wire gauge 0.34 mm<sup>2</sup> / 0.5 mm<sup>2</sup>





Mating face


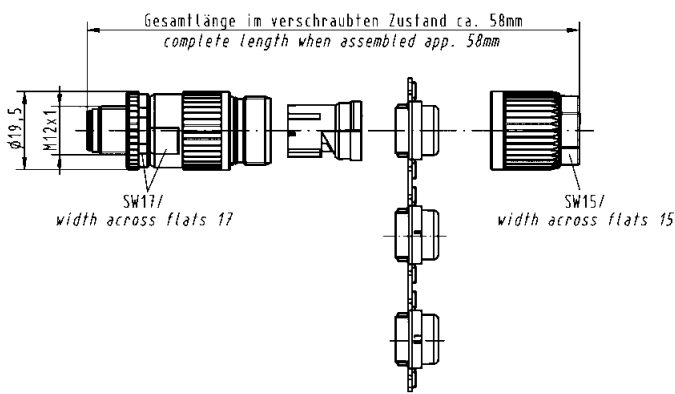


B-coding  
Mating face  
acc. to IEC 61076-2-101



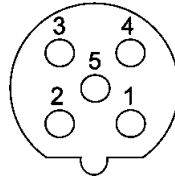
## Applications / Advantages

- B-coding for field bus systems e.g. Profibus, DeviceNet or CANopen
- Available with crimp resp. HARAX® rapid termination, or as overmoulded system cable in various lengths
- Shielding by the hood
- Easy handling, quick assembly

Identification	Part number	Drawing	Dimensions in mm
<p><b>HARAX® M12-L, shielded</b></p>  <p>Male 2 poles, B-coding 0.25 - 0.34 mm<sup>2</sup> / AWG 24 - 22</p>	<p>21 03 241 1301</p>	 <p>Gesamtlänge im verschraubten Zustand ca. 58mm complete length when assembled app. 58mm</p> <p>SW17/ width across flats 17</p> <p>SW15/ width across flats 15</p>	



Mating face



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



Identification

Part number

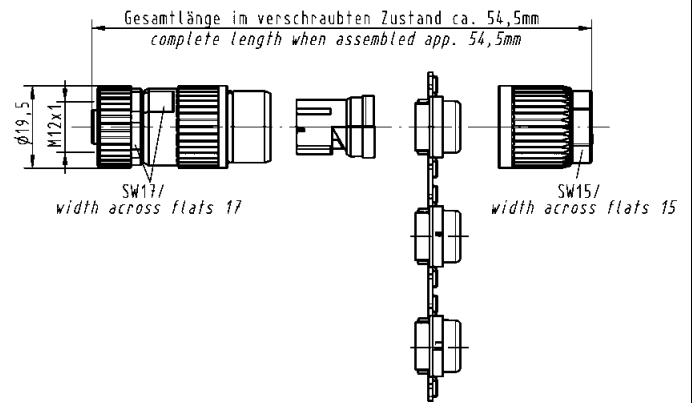
Drawing

Dimensions in mm

HARAX® M12-L, shielded



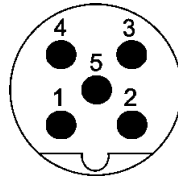
21 03 241 2301



Female  
2 poles, B-coding  
0.25 - 0.34 mm<sup>2</sup> / AWG 24 - 22



Mating face



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



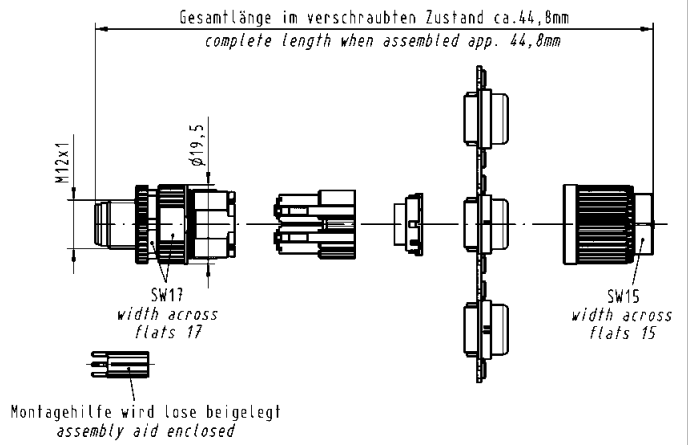
Identification	Part number	Drawing	Dimensions in mm
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M12 Crimp



Male  
5 poles, B-coding

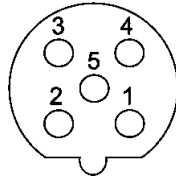
21 03 841 1505



# M12 Crimp B-coded



Mating face



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



Circular  
Connectors

Identification

Part number

Drawing

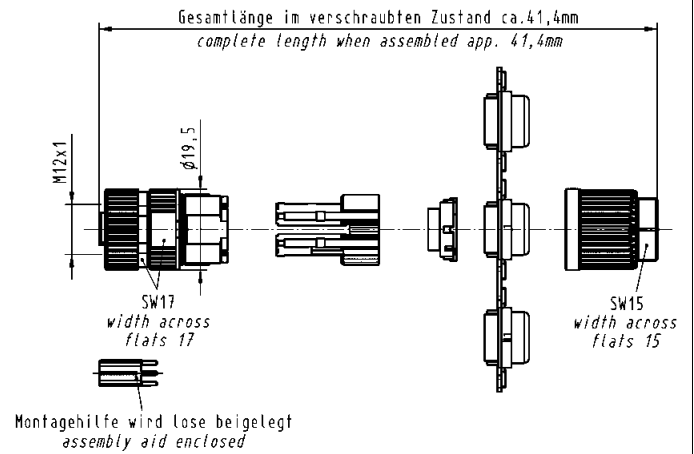
Dimensions in mm

M12 Crimp



Female  
5 poles, B-coding

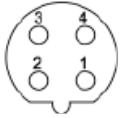
21 03 841 2505







Male, 4 poles



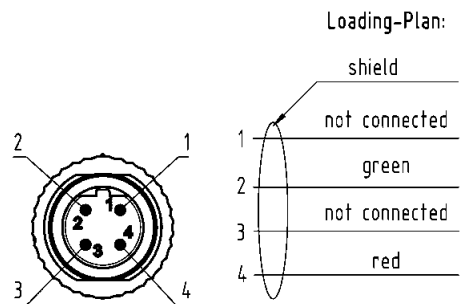
Female, 4 poles



## Technical characteristics

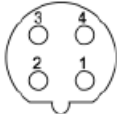
System cables with M12 circular connectors shielded, B-coding

	4-poles	
	PVC	PUR
Rated voltage	max. 160 V AC/DC	max. 160 V AC/DC
Rated current / contact	max. 4 A at +40 °C	max. 4 A at +40 °C
Screw locking	M12x1, self securing	M12x1, self securing
Recommended torque	0.6 Nm	0.6 Nm
Temperature range (working and storage)	-30 °C ... +80 °C	-30 °C ... +80 °C
Degree of protection	IP67	IP67
Number of wires / wire gauge	2 x AWG 22	2 x AWG 24
Conductor insulation	PVC (rd, gn)	PE (rd, gn)
Arrangement of insulated strands	1 x Ø 0.65 mm	19 x Ø 0.14 mm
Sheath	PVC	PUR (UL, CSA)
Sheath colour	violet	violet
Outer diameter	Ø 8.0 ± 0.4 mm	Ø 8.5 ± 0.4 mm
Useable as trailing cable	no	yes
Halogen free acc. to	–	DIN VDE 0472 part 815
Flame retardant acc. to	DIN EN 60332-1-2	DIN EN 60332-1-2
Oil-resistant	IEC 80811-2-1 (4h/60°C)	DIN EN 60811-2-1





Male, 4 poles



Female, 4 poles



## Part number definition



### Connector 1

- 88 Male straight
- 89 Female straight
- 90 Male angled
- 91 Female angled

### Connector 2

- 00 No connector
- 88 Male straight
- 89 Female straight
- 90 Male angled
- 91 Female angled

### Number of contacts

4 4 poles

### Cable material

- 86 PVC
- 87 PUR

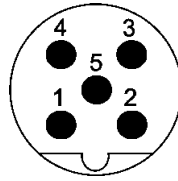
### Preferred length\*

- 005 0.5 m
- 010 1.0 m
- 015 1.5 m
- 020 2.0 m
- 050 5.0 m
- 075 7.5 m
- 100 10.0 m

\* Other length on request



Mating face




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



## Applications / Advantages

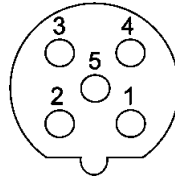
- B-coding for field bus systems e.g. Profibus, DeviceNet or CANopen
- For panel feed-through or PCB, straight version in IP20 or IP67, with or without assembled pigtail
- Available with crimp resp. HARAX® rapid termination
- Quick and easy assembly

Identification	Part number	Drawing	Dimensions in mm
<p><b>HARAX® Panel feed-through</b></p>  <p>Male 2 poles and shielding, B-coding 0.25 - 0.34 mm<sup>2</sup> / AWG 24 - 22</p> <p>Cable diameter: 7 - 8.8 mm</p> <p>Panel thickness min. 2.5 mm max. 4.5 mm</p>	<p>21 03 341 1425</p>	<p>Gesamtlänge in verschraubten Zustand ca. 57mm complete length when assembled app. 57mm</p> <p>18.4</p> <p>M12x1.5</p> <p>M16x1.5</p> <p>SW17 width across flats 17</p> <p>SW13 width across flats 13</p> <p>15.4 ± 0.2</p> <p>20</p>	

# M12 Panel feed-through HARAX® B-coded



Mating face



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



Circular  
Connectors

Identification

Part number

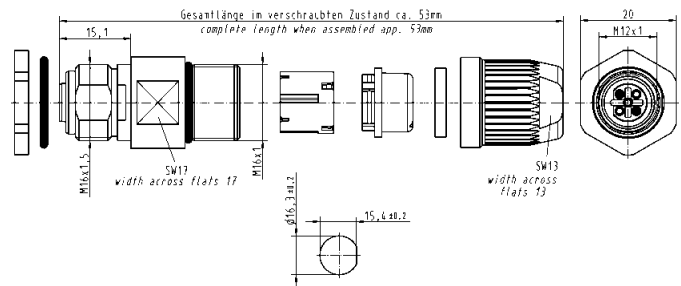
Drawing

Dimensions in mm

HARAX® Panel feed-through



21 03 341 2425



Female  
2 poles and shielding, B-coding  
0.25 - 0.34 mm<sup>2</sup> / AWG 24 - 22

Cable diameter: 7 - 8.8 mm

Panel thickness  
min. 2.5 mm  
max. 4.5 mm

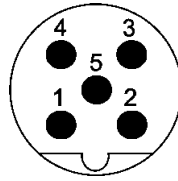
# M12 Panel feed-through Crimp B-coded



Circular Connectors



Mating face



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



Identification	Part number	Drawing	Dimensions in mm
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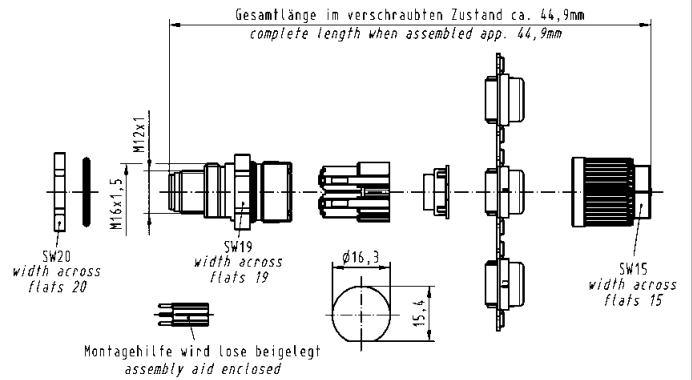
M12 Panel feed-through Crimp



Male  
5 poles, B-coding

Panel thickness  
min. 2.5 mm  
max. 4.5 mm

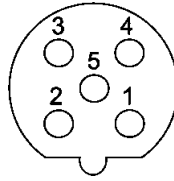
21 03 841 1525



# M12 Panel feed-through Crimp B-coded



Mating face



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



Circular  
Connectors

Identification                      Part number                      Drawing                      Dimensions in mm

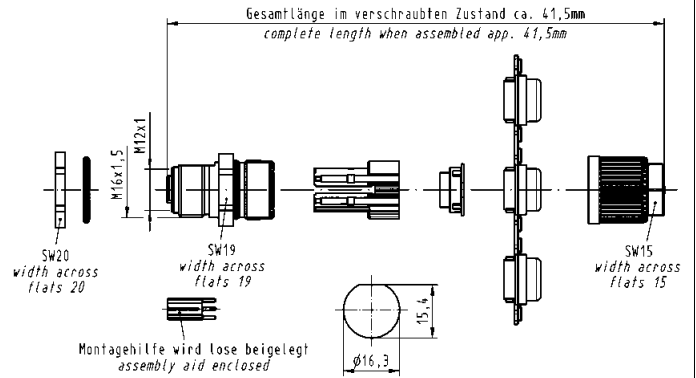
M12 Panel feed-through Crimp



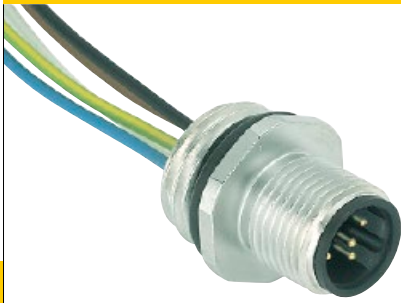
Female  
5 poles, B-coding

Panel thickness  
min. 2.5 mm  
max. 4.5 mm

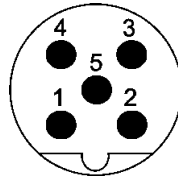
21 03 841 2525



# M12 Panel feed-through B-coded



Mating face



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



Identification	Part number	Drawing	Dimensions in mm
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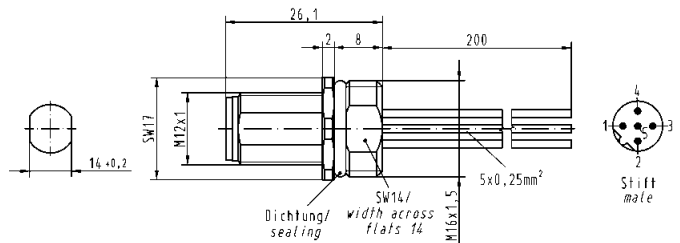
## M12 Panel feed-through



Male  
B-coding, 20 cm conductors,  
0.25 mm<sup>2</sup>

Panel thickness  
min. 2.0 mm  
max. 5.0 mm

21 03 339 1301



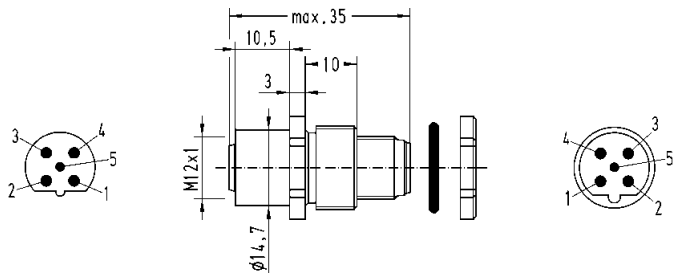
## M12-male/female panel feed-through

B-coding



Panel thickness  
min. 2.0 mm  
max. 5.0 mm

21 03 330 1300

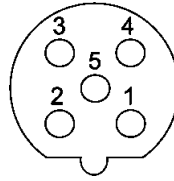


Rated voltage 24 V AC/DC  
Thread M16 x 1.5

# M12 Panel feed-through B-coded



Mating face



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



Circular  
Connectors

Identification

Part number

Drawing

Dimensions in mm

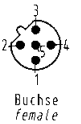
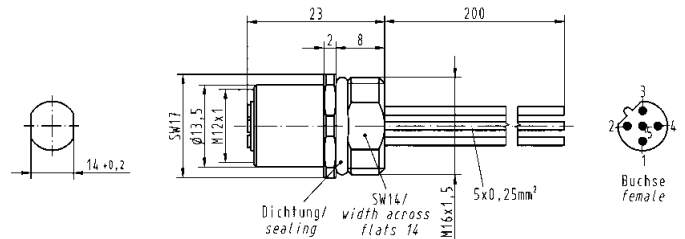
M12 Panel feed-through



Female  
B-coding, 20 cm conductors,  
0.25 mm<sup>2</sup>

Panel thickness  
min. 2.0 mm  
max. 5.0 mm

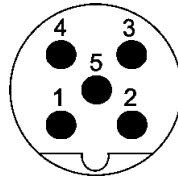
21 03 339 2301







Mating face



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



## Technical characteristics: M12 PCB adapter

Degree of protection	IP20, IP67 (mated and locked)	Temperature during connection	-5 °C ... +50 °C
Rated current	max. 4 A (dependant on PCB layout)	Termination	PIH
Rated voltage	50 V	Contact material	Copper alloy
Mating cycles	max. 100	Contact plating (mating side)	Au over Ni
Limiting temperature	-40 °C ... +85 °C	Insulator material	PA

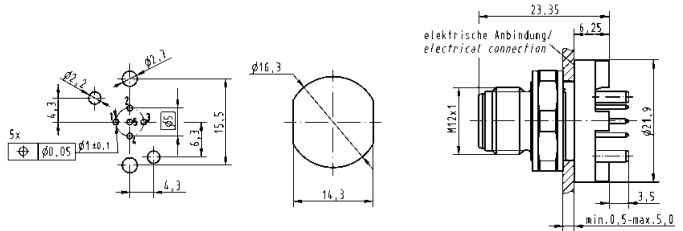
Identification	Part number	Drawing	Dimensions in mm
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M12 PCB adapter  
Male, B-coding,  
straight



5 poles, IP20

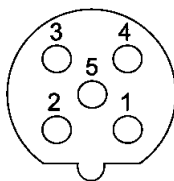
21 03 341 1505



# M12 PCB adapter B-coded



Mating face



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



Circular Connectors

Identification

Part number

Drawing

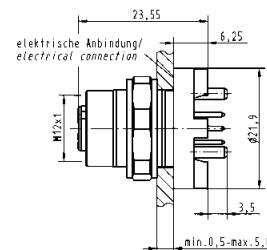
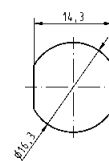
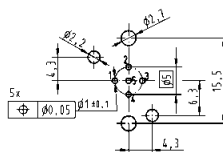
Dimensions in mm

M12 PCB adapter  
Female, B-coding,  
straight



5 poles, IP20

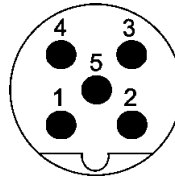
21 03 341 2505



# M12 PCB adapter shielded B-coded



Mating face



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



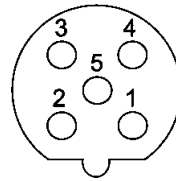
Circular Connectors

Identification	Part number	Drawing	Dimensions in mm
<p>M12 PCB adapter, shielded</p> <p><b>Packaging: 60 pieces in a tray</b> Order housing separately</p> <p>Male 5 poles, B-coding</p> <p><b>Packaging: 1 piece incl. housing</b></p> <p>Male 5 poles, B-coding, rear mounting 5 poles, B-coding, front mounting</p>	<p>21 03 341 1518*</p> <p>21 03 341 1530*</p> <p>21 03 341 1531*</p>		
<p>Housing</p> <p><b>Packaging: 10 pieces in a tube</b></p> <p>for rear mounting</p> <p>for front mounting</p>	<p>21 03 301 1000</p> <p>21 03 301 1001</p>		

# M12 PCB adapter shielded B-coded



Mating face



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



Circular  
Connectors

Identification

Part number

Drawing

Crimping tool  
for M12 Crimp

09 99 000 0501



Accessories M12 Crimp

Locator

09 99 000 0531



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

D-Sub single contacts  
(500 mating cycles)

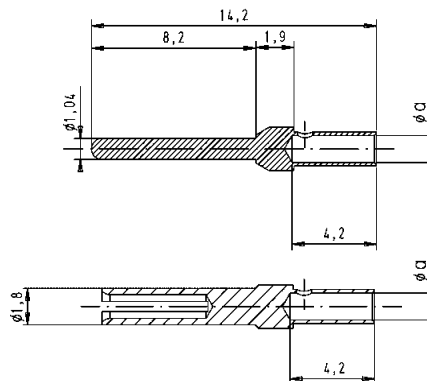
turned male contacts

AWG 22-18 / 0.33-0.82 mm <sup>2</sup>	09 67 000 3576
AWG 24-20 / 0.25-0.52 mm <sup>2</sup>	09 67 000 8576
AWG 26-22 / 0.13-0.33 mm <sup>2</sup>	09 67 000 5576
AWG 28-24 / 0.09-0.25 mm <sup>2</sup>	09 67 000 7576



turned female contacts

AWG 22-18 / 0.33-0.82 mm <sup>2</sup>	09 67 000 3476
AWG 24-20 / 0.25-0.52 mm <sup>2</sup>	09 67 000 8476
AWG 26-22 / 0.13-0.33 mm <sup>2</sup>	09 67 000 5476
AWG 28-24 / 0.09-0.25 mm <sup>2</sup>	09 67 000 7476



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

M12  
dynamometric screwdriver

Tightening torque 0.6 Nm

for M12-S SW 13

09 99 000 0382

for M12-L SW 17

09 99 000 0384



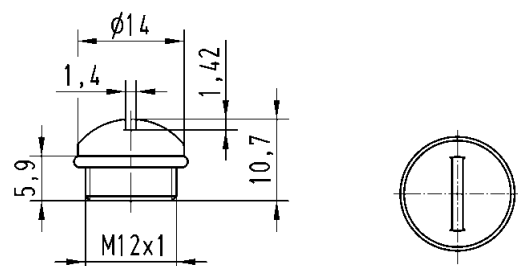
Cap M12


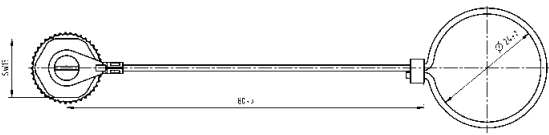



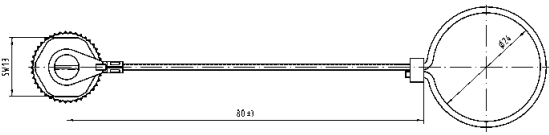

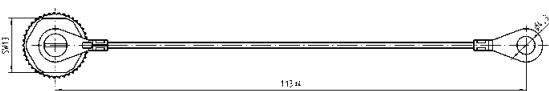
for IP65 / 67


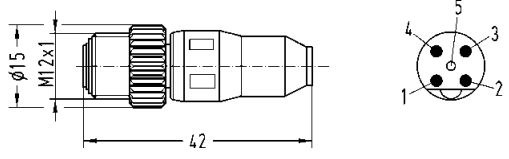




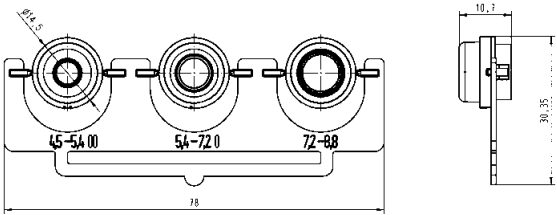

Seals material Viton

Plastic cap for female

21 01 000 0003



Identification	Part number	Drawing	Dimensions in mm
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for male side with cord</p> 	<p>21 01 000 0033</p>		
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for male side with cable clip</p> 	<p>21 01 000 0038</p>		
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for female side with cord</p> 	<p>21 01 000 0030</p>		
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for female side with cable clip</p> 	<p>21 01 000 0031</p>		

Identification	Part number	Drawing	Dimensions in mm
<p>M12-male moving load B-coding</p> 	<p>21 03 030 1300</p>		
<p>HARTING M12 T-Coupler</p>	<p>21 03 341 6401</p>		
<p>Seal M12-L unshielded for 4.7 - 6 mm cable Ø for 6 - 8 mm cable Ø</p> 	<p>21 01 010 2015 21 01 010 2007</p>		
<p>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</p> 	<p>21 01 010 2017</p>		
<p>Accessories M12 Lock nut</p>	<p>21 01 000 0018</p>		

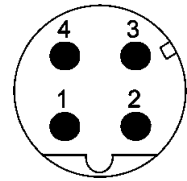




**Specifications** IEC 60352-4

**Approval**

Mating face



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



## Technical characteristics M12 – D-coding

Type M12 D-coded	HARAX® M12 L shielded	M12 Crimp	M12 preLink®
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### General data

Conductor cross section	0.14 - 0.34 mm <sup>2</sup> AWG 26-22 0.34 - 0.5 mm <sup>2</sup> AWG 22-20	0.13 - 0.75 mm <sup>2</sup> AWG 26-18	0.10 - 0.34 mm <sup>2</sup> AWG 27-22
Diameter of individual strands	≥ 0.1 mm	X	≥ 0.1 mm
Conductor insulation material	PVC/PE	X	PVC/PE
Conductor diameter	1.2 - 2.0 mm	2.0 - 2.3 mm	0.8 - 1.6 mm
Cable diameter	4.5 - 8.8 mm	4 poles: 4.5 - 8.8 mm 5 poles: 4.5 - 8.8 mm	6.3 - 6.7 mm
Temperature range	-40 °C ... +85 °C	-40 °C ... +85 °C	-40 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C	-5 °C ... +50 °C	–
Degree of protection	IP65 / 67	IP67	IP65 / IP67
Mating cycles	100	500	250
Tightening torque connector / Hexagonal wrench	0.6 Nm / SW 17	0.6 Nm / SW 17	0.6 Nm / SW 17

### Electrical characteristics

Rated current	4 A	4 A	1 A
Rated voltage	50 V	250 V	48 V
Rated impulse voltage	1.5 kV	1.5 kV	1.5 kV
Contact resistance	10 mΩ	10 mΩ	10 mΩ
Insulation resistance	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω
Pollution degree	3	3	3
Overvoltage category	3	3	3
Isolation group	1	1	–
Transmission performance (Category)	Cat. 5	Cat. 5	Cat. 5

### Materials

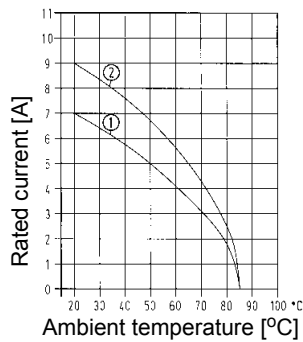
Contact material	Brass	Brass	Brass
Contact plating	Gold	Gold	Gold
Contact carrier material	PA unreinforced	PA	–
Housing material	PA unreinforced	PA	Zinc die-cast

## Technical characteristics M12 – D-coding

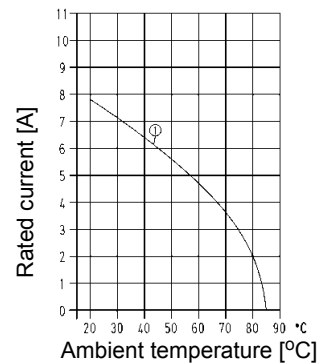
**Current carrying capacity** The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is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

Control and test procedures according to DIN IEC 60512-5.

**M12-L**  
3 poles, 4 poles  
1 = Wire gauge 0.34 mm<sup>2</sup>  
2 = Wire gauge 0.75 mm<sup>2</sup>

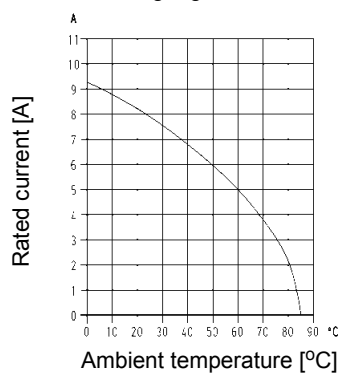


**M12, Crimp** 1 = Wire gauge 0.34 mm<sup>2</sup> / 0.5 mm<sup>2</sup>

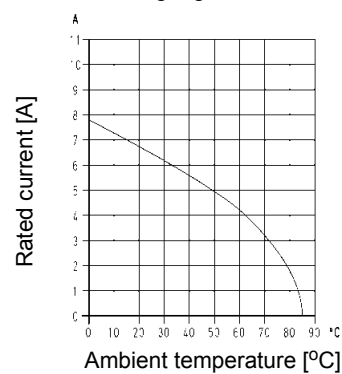


## Technical characteristics M12 – D-coding, PCB adapter

**M12, D-coding, straight, female, 4 poles**  
Wire gauge 0.5 mm<sup>2</sup>

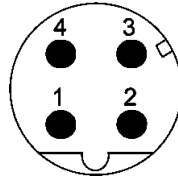


**M12, D-coding, angled, female, 4 poles**  
Wire gauge AWG 22





Mating face


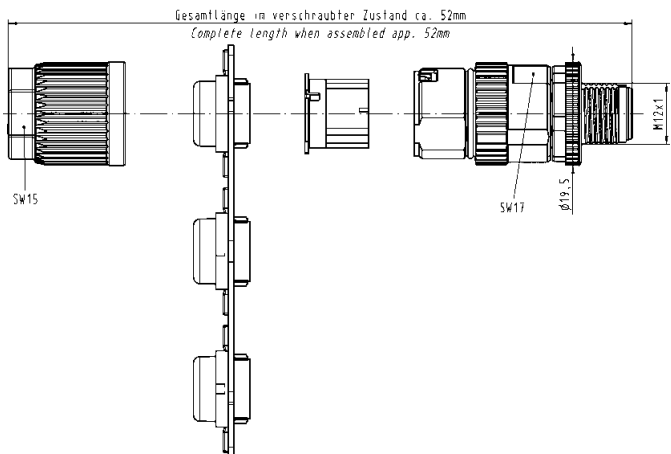


D-coding  
Mating face  
acc. to IEC 61076-2-101



### Applications / Advantages

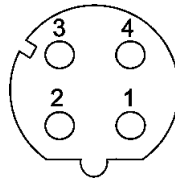
- D-coding for Ethernet/Profinet applications
- Robust design
- 360° shielding termination
- Transmission performance Cat. 5

Identification	Part number	Drawing	Dimensions in mm
<p><b>HARAX® M12-L, shielded</b></p>  <p>Male 4 poles, D-coding 0.14 - 0.34 mm<sup>2</sup>, AWG 26 - 22</p> <p>Male 4 poles, D-coding 0.34 - 0.5 mm<sup>2</sup>, AWG 22 - 20</p>	<p>21 03 281 1405</p> <p>21 03 282 1405</p>	 <p>Gesamtlänge im verschraubter Zustand ca. 52mm Complete length when assembled app. 52mm</p> <p>SW15</p> <p>SW17</p> <p>∅19.5</p> <p>M12x1</p>	

# M12 HARAX® D-coded



Mating face



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



Circular  
Connectors

Identification

Part number

Drawing

Dimensions in mm

**HARAX® M12-L, shielded**

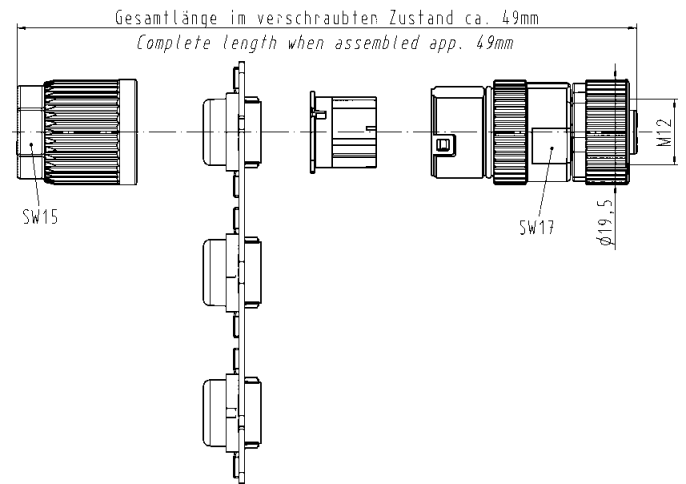


Female  
4 poles, D-coding  
0.14 - 0.34 mm<sup>2</sup>, AWG 26 - 22

21 03 281 2405

Female  
4 poles, D-coding  
0.34 - 0.5 mm<sup>2</sup>, AWG 22 - 20

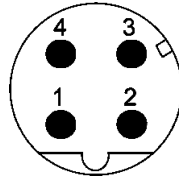
21 03 282 2405







Mating face



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



Identification

Part number

Drawing

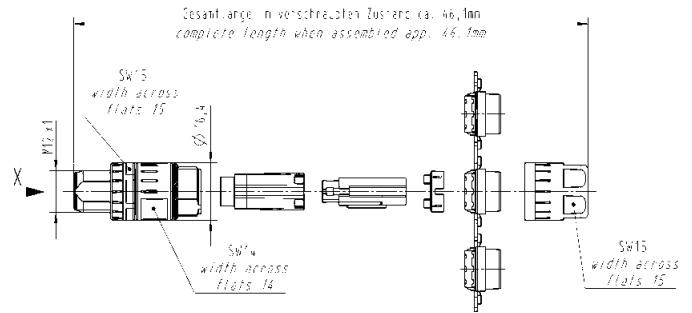
Dimensions in mm

M12 Crimp Slim design, shielded



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

21 03 881 1405\*

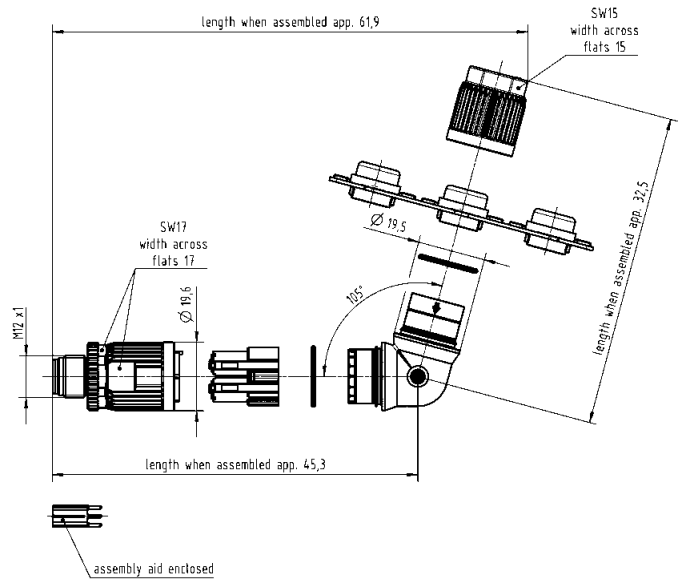


M12 Crimp, shielded



Male  
4 poles, D-coding  
angled

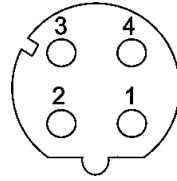
21 03 882 3405\*



# M12 Crimp D-coded



Mating face



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



Identification

Part number

Drawing

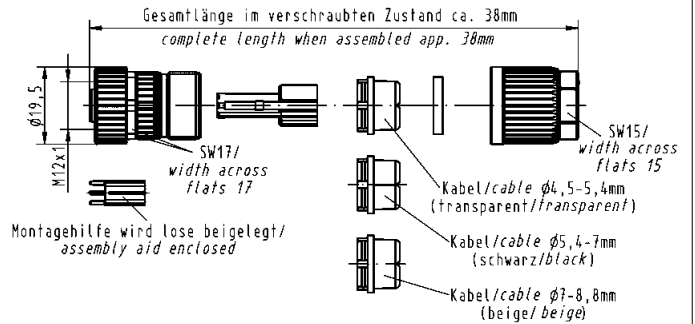
Dimensions in mm

M12 Crimp, shielded



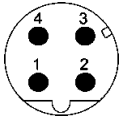
Female  
4 poles, D-coding

21 03 882 2405

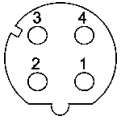








Male, 4 poles



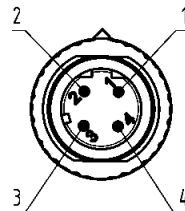
Female, 4 poles



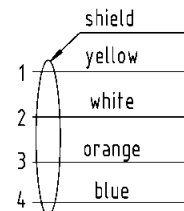
## Technical characteristics

System cables with M12 circular connectors shielded, D-coding

	4 poles	
	PVC	PUR
Rated voltage	max. 160 V AC/DC	max. 160 V AC/DC
Rated current / contact	max. 4 A at +40 °C	max. 4 A at +40 °C
Screw locking	M12x1, self securing	M12x1, self securing
Recommended torque	0.6 Nm	0.6 Nm
Temperature range (working and storage)	-30 °C ... +80 °C	-30 °C ... +80 °C
Degree of protection	IP67	IP67
Number of wires / wire gauge	4 x 0.34 mm <sup>2</sup>	4 x 0.34 mm <sup>2</sup>
Conductor insulation	PE (ye, wh, og, bu)	PE (ye, wh, og, bu)
Arrangement of insulated strands	7 x Ø 0.25 mm (AWG 22)	7 x Ø 0.25 mm (AWG 22)
Sheath	PVC	PUR (UL, CSA)
Sheath colour	green	green
Outer diameter	Ø 6.5 ± 0.2 mm	Ø 6.5 ± 0.2 mm
Useable as trailing cable	no	yes
Halogen free acc. to	–	IEC 60754
Flame retardant acc. to	UL 1685 (CSA FT4)	IEC 60332-1-2 und UL 2556 VW1
Oil-resistant	IEC 80811-2-1 (4h/70°C)	IEC 60811-2-1 und UL13

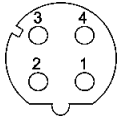


Loading-Plan:





Male, 4 poles



Female, 4 poles



## Part number definition



- Connector 1**
- 92 Male straight
  - 93 Female straight
  - 94 Male angled
  - 95 Female angled

- Connector 2**
- 00 No connector
  - 92 Male straight
  - 93 Female straight
  - 94 Male angled
  - 95 Female angled

**Number of contacts**  
4 4 poles

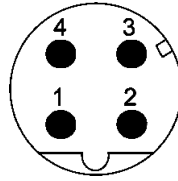
- Cable material**
- 05 PVC
  - 77 PUR

- Preferred length\***
- 005 0.5 m
  - 010 1.0 m
  - 015 1.5 m
  - 020 2.0 m
  - 050 5.0 m
  - 075 7.5 m
  - 100 10.0 m

\* Other length on request



Mating face


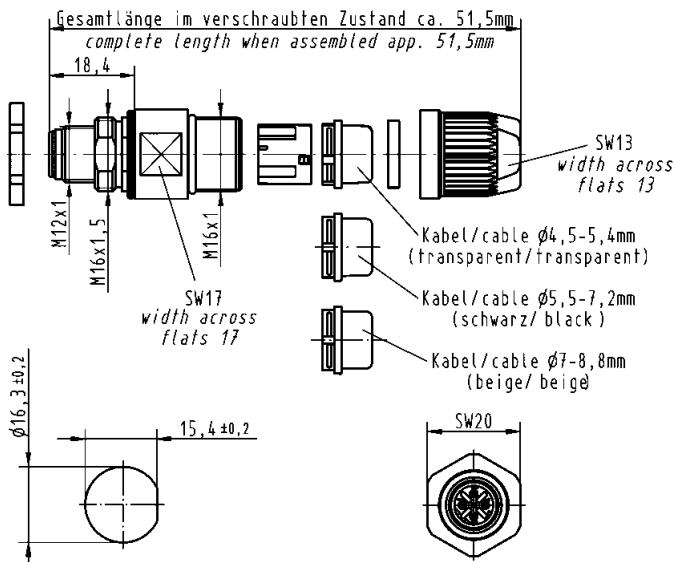


D-coding  
Mating face  
acc. to IEC 61076-2-101



## Applications / Advantages

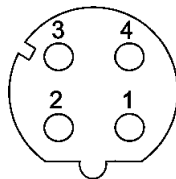
- D-coding for Ethernet/Profinet applications
- Patent HARAX® fast termination
- Robust design
- 360° shielding termination
- Transmission performance Cat. 5

Identification	Part number	Drawing	Dimensions in mm
<p><b>HARAX® Panel feed-through</b></p>  <p>Male 4 poles, D-coding 0.14 - 0.34 mm<sup>2</sup> / AWG 26 - 22</p> <p>Panel thickness min. 2.5 mm max. 4.5 mm</p>	<p>21 03 381 1425</p>	 <p>Gesamtlänge im verschraubten Zustand ca. 51,5mm complete length when assembled app. 51,5mm</p> <p>18,4</p> <p>M12x1</p> <p>M16x1,5</p> <p>M16x1</p> <p>SW17 width across flats 17</p> <p>SW13 width across flats 13</p> <p>Kabel/cable <math>\phi</math>4,5-5,4mm (transparent/transparent)</p> <p>Kabel/cable <math>\phi</math>5,5-7,2mm (schwarz/black)</p> <p>Kabel/cable <math>\phi</math>7-8,8mm (beige/beige)</p> <p><math>\phi</math>16,3<math>\pm</math>0,2</p> <p>15,4<math>\pm</math>0,2</p> <p>SW20</p>	

# M12 Panel feed-through HARAX® D-coded



Mating face



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



Circular  
Connectors

Identification

Part number

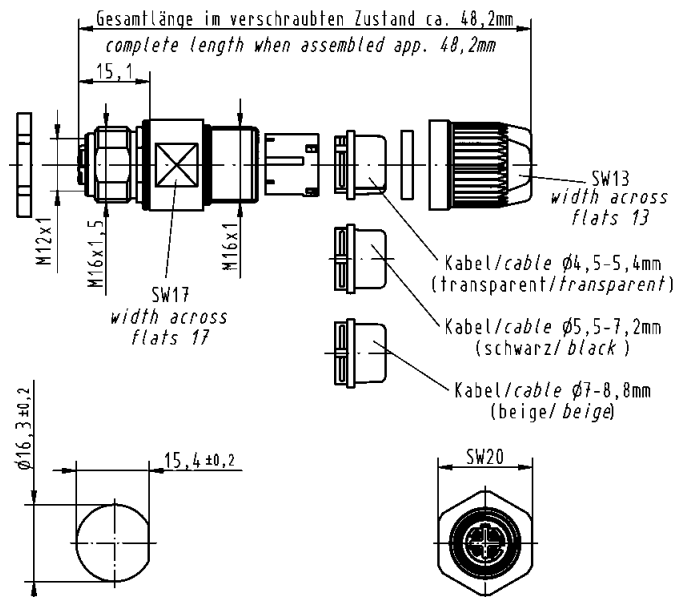
Drawing

Dimensions in mm

HARAX® Panel feed-through



21 03 381 2425



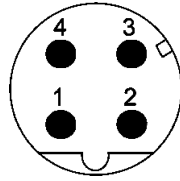
Female  
4 poles, D-coding  
0.14 - 0.34 mm<sup>2</sup> / AWG 26 - 22

Panel thickness  
min. 2.5 mm  
max. 4.5 mm

# M12 Panel feed-through Crimp D-coded



Mating face



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



Identification

Part number

Drawing

Dimensions in mm

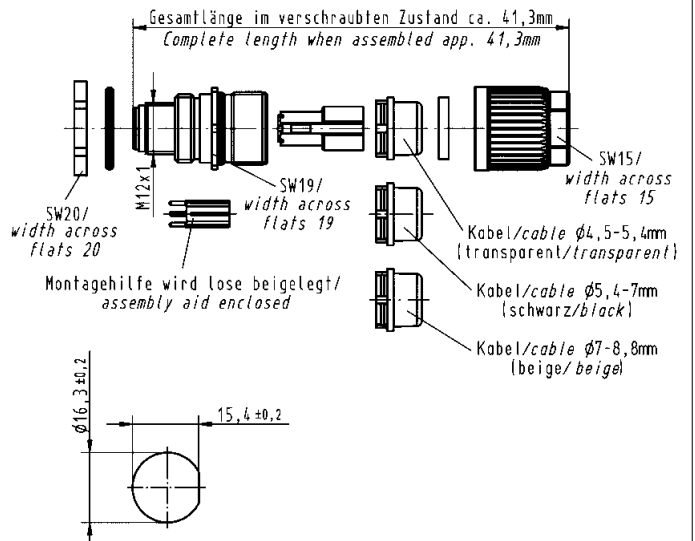
M12 Panel feed-through Crimp



Male  
4 poles, D-coding

Panel thickness  
min. 2.5 mm  
max. 4.5 mm

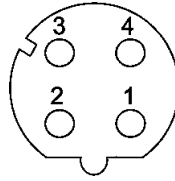
21 03 882 1425



# M12 Panel feed-through Crimp D-coded



Mating face



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



Circular  
Connectors

Identification

Part number

Drawing

Dimensions in mm

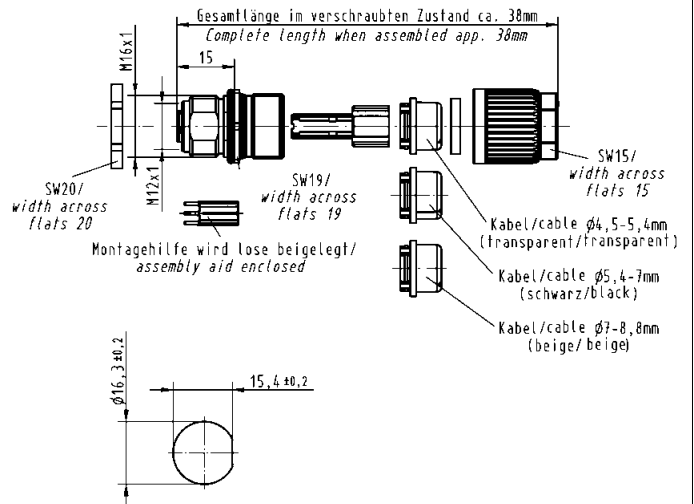
M12 Panel feed-through Crimp



Female  
4 poles, D-coding

Panel thickness  
min. 2.5 mm  
max. 4.5 mm

21 03 882 2425



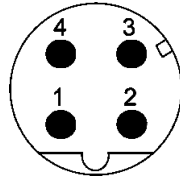
# M12 Panel feed-through D-coded



Circular Connectors



Mating face



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

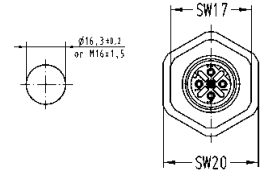
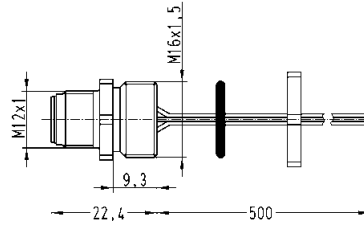


Identification	Part number	Drawing	Dimensions in mm
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M12 Panel feed-through



21 03 371 1403



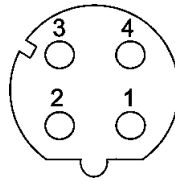
Male  
D-coding  
50 cm conductors, AWG 22, 4 poles

Panel thickness  
min. 2.0 mm  
max. 5.0 mm

# M12 Panel feed-through D-coded



Mating face



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



Circular  
Connectors

Identification

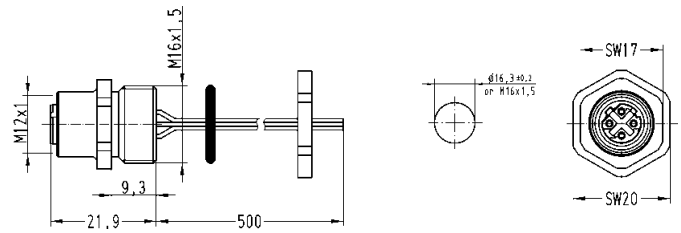
Part number

Drawing

Dimensions in mm

M12 Panel feed-through

21 03 371 2403



Female  
D-coding  
50 cm conductors, AWG 22, 4 poles

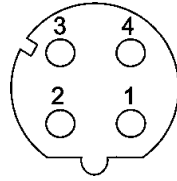
Panel thickness  
min. 2.0 mm  
max. 5.0 mm



# M12 Panel feed-through D-coded



Mating face



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



Circular  
Connectors

Identification	Part number	Drawing	Dimensions in mm
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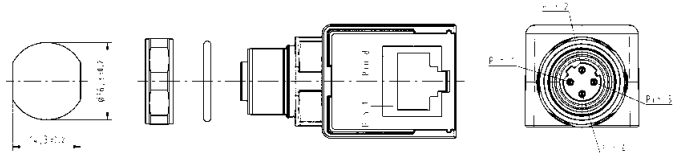
M12 Female-RJ45  
Panel feed-through



4 poles, D-coding  
angled

Panel thickness  
min. 2.1 mm  
max. 4.5 mm

21 03 381 4401\*



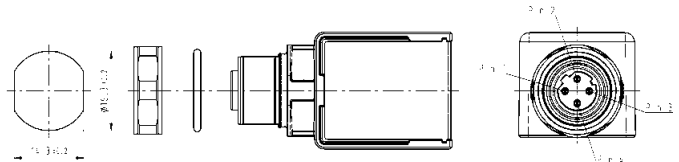
M12 Female-RJ45  
Panel feed-through



4 poles, D-coding  
straight

Panel thickness  
min. 2.1 mm  
max. 4.5 mm

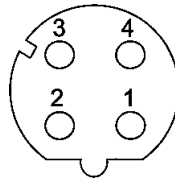
21 03 381 2401\*



# M12 Panel feed-through D-coded



Mating face



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



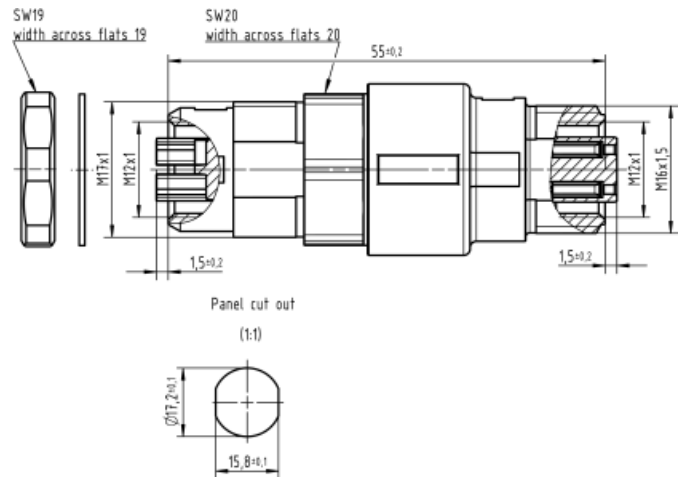
Circular Connectors

Identification      Part number      Drawing      Dimensions in mm

M12 Gender Changer  
Female-Female

4 poles, D-coding  
8 poles, X-coding

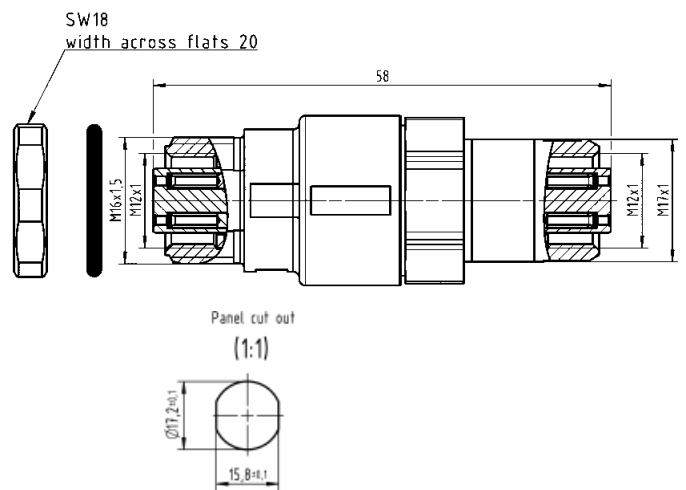
21 03 381 6402\*



M12 Gender Changer  
Female-Female

4 poles, D-coding  
Cat. 5

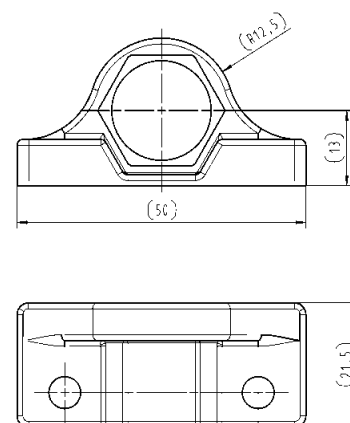
21 03 381 6401\*



Wall bracket



21 01 000 0036








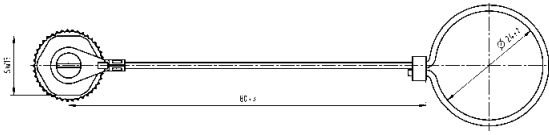

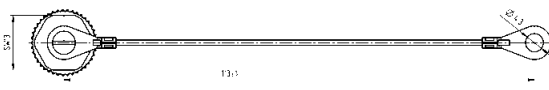

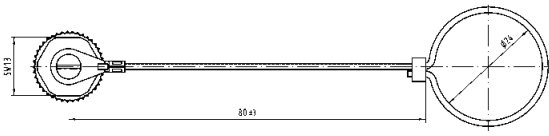

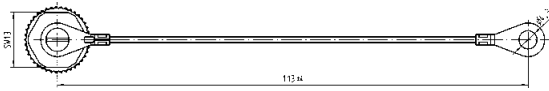

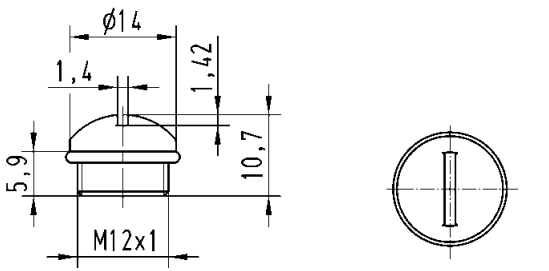






Identification	Part number	Drawing																								
<p>Crimping tool for M12 Crimp</p>	09 99 000 0501																									
<p>Accessories M12 Crimp</p> <p>Locator</p> <p>D-Sub single contacts (500 mating cycles)</p> <p>turned male contacts</p> <p>AWG 22-18 / 0.33-0.82 mm<sup>2</sup>    09 67 000 3576</p> <p>AWG 24-20 / 0.25-0.52 mm<sup>2</sup>    09 67 000 8576</p> <p>AWG 26-22 / 0.13-0.33 mm<sup>2</sup>    09 67 000 5576</p> <p>AWG 28-24 / 0.09-0.25 mm<sup>2</sup>    09 67 000 7576</p> <p>turned female contacts</p> <p>AWG 22-18 / 0.33-0.82 mm<sup>2</sup>    09 67 000 3476</p> <p>AWG 24-20 / 0.25-0.52 mm<sup>2</sup>    09 67 000 8476</p> <p>AWG 26-22 / 0.13-0.33 mm<sup>2</sup>    09 67 000 5476</p> <p>AWG 28-24 / 0.09-0.25 mm<sup>2</sup>    09 67 000 7476</p>	09 99 000 0531	<p>D-Sub contacts</p> <table border="1"> <thead> <tr> <th>Part number</th> <th>AWG</th> <th>Tool settings</th> </tr> </thead> <tbody> <tr> <td rowspan="3">09 67 000 3x76</td> <td>18</td> <td>6</td> </tr> <tr> <td>20</td> <td>6</td> </tr> <tr> <td>22</td> <td>5</td> </tr> <tr> <td>09 67 000 8x76</td> <td>20, 22, 24</td> <td>6</td> </tr> <tr> <td>09 67 000 5x76</td> <td>22, 24, 26</td> <td>6</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th></th> <th>a</th> </tr> </thead> <tbody> <tr> <td>AWG 22-18</td> <td>1.34</td> </tr> <tr> <td>AWG 24-20</td> <td>1.13</td> </tr> <tr> <td>AWG 26-22</td> <td>0.88</td> </tr> </tbody> </table>	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
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																									
<p>M12 dynamometric screwdriver</p> <p>Tightening torque 0.6 Nm</p> <p>for M12 Slim design    SW 15    09 99 000 0646</p> <p>for M12-L    SW 17    09 99 000 0384</p>																										
<p>Set of seals M12-L shielded</p> <p>for 4.5 - 5.4 mm cable Ø</p> <p>for 5.4 - 7.2 mm cable Ø</p> <p>for 7.2 - 8.8 mm cable Ø</p>	21 01 010 2017																									
<p>Accessories M12</p> <p>Lock nut</p>	21 01 000 0018																									



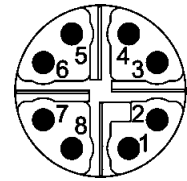
Identification	Part number	Drawing	Dimensions in mm
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for male side with cord</p> 	<p>21 01 000 0033</p>		
<p><b>Cap metal M12</b> for IP65 / 67 M12 metal cap for male side with cable clip</p> 	<p>21 01 000 0038</p>		
<p><b>Cap metal M12</b> for IP65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

**Specifications** IEC 60352-4

**Approval**



Mating face



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

## Technical characteristics M12 – X-coding

<b>Type M12 X-coded</b>	<i>har-speed M12</i> <i>har-speed M12 Slim design</i>
-------------------------	--

### General data

Conductor cross section	0.08 - 0.25 mm <sup>2</sup> AWG 28-23
Diameter of individual strands	–
Conductor insulation material	–
Conductor diameter	0.33 - 0.61 mm
Cable diameter	5.7 - 8.8 mm
Temperature range	-40 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C
Degree of protection	IP65 / 67
Mating cycles	500
Tightening torque connector / hexagonal wrench	0.6 Nm / SW 15

### Electrical characteristics

Rated current	0.5 A
Rated voltage	48 V
Rated impulse voltage	0.8 kV
Contact resistance	15 mΩ
Insulation resistance	10 <sup>8</sup> Ω
Pollution degree	3
Overvoltage category	3
Isolation group	1
Transmission performance (Category)	Cat. 6 <sub>A</sub>

### Materials

Contact material	Brass
Contact plating	Gold
Contact carrier material	LCP
Housing material	ZP410

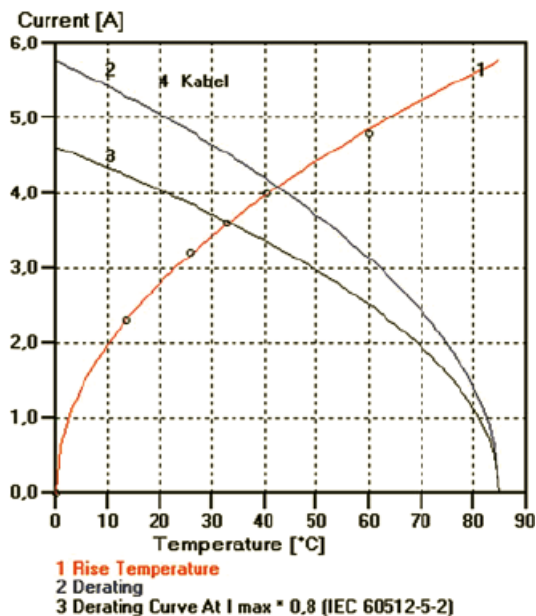
## Technical characteristics M12 – X-coding

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

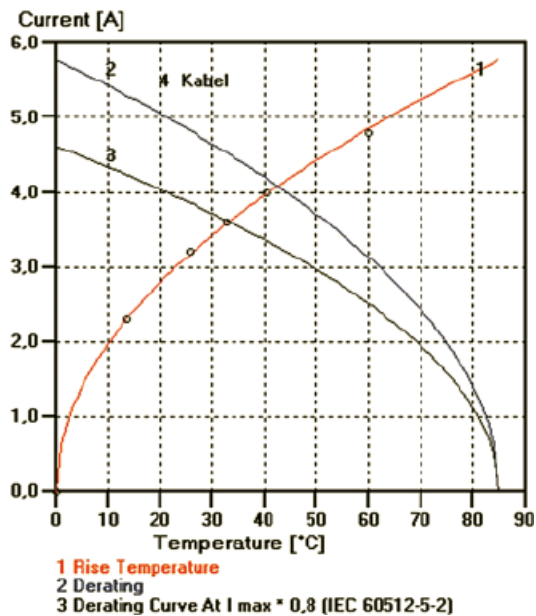
Control and test procedures according to DIN IEC 60512-9-1.

Circular Connectors

har-speed M12  
8 poles

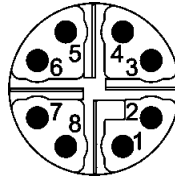


har-speed M12  
PCB adapter





Mating face



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



## Applications / Advantages

- High-Speed Ethernet applications for process automatization, e.g. camera system for process control in the production
- Maximum data rates through the configuration of the contacts in conformance with Ethernet technology. Transfer class E<sub>A</sub> for 1 and 10 Gigabit
- Perfect shielding through paired shielding of the contacts
- Overmoulded system cables in various lengths

Identification

Part number

Drawing

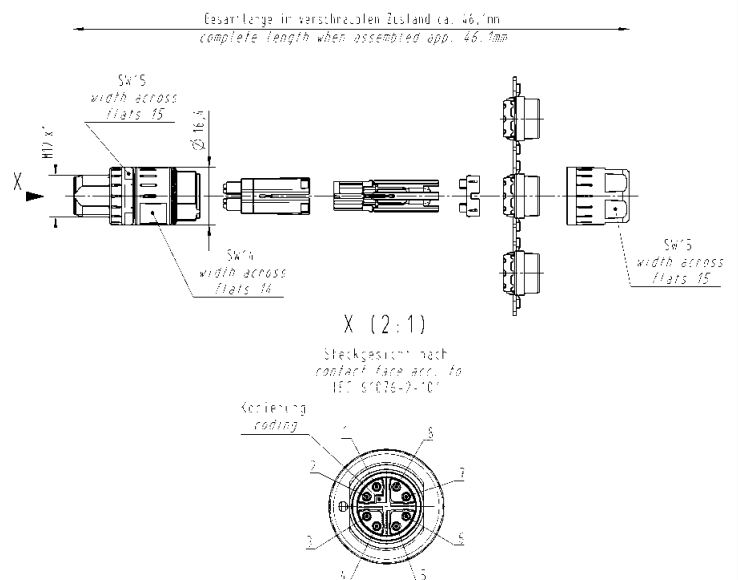
Dimensions in mm

har-speed M12 Slim design



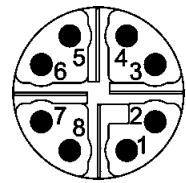
Male  
straight version  
8 poles, Cat. 6<sub>A</sub>  
Cable diameter: 5.7 - 8.8 mm

21 03 881 1805





Mating face



X-coding Mating face acc. to IEC 61 076-2-101


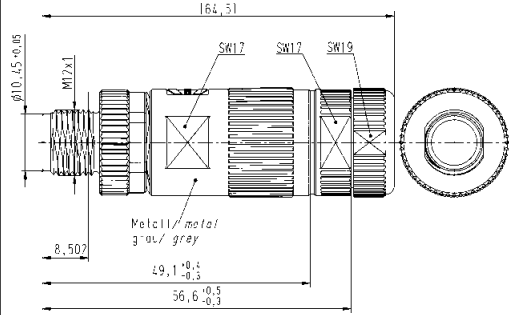

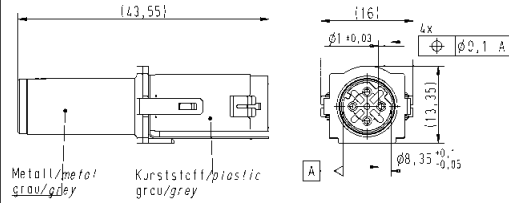
## Ha-VIS preLink® M12 connector X-coding

### Advantages

- M12 Ethernet-Data connector suitable for industry
- Robust design
- 360° shielding
- Category of transmission Cat. 6A
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

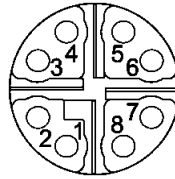
### Technical characteristics

Connector type	M12 X-coding acc. to IEC 61 076-2-101
Number of contacts	8
Transmission category	Category 6A, Class EA, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6A / Class EA 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® Connectable cables	terminal module, yellow, 20 82 000 0001
– Conductor cross section	AWG 23 ... AWG 22 (solid and stranded)
– Conductor diameter	1.3 ... 1.6 mm
Cable termination for preLink® Connectable cables	terminal module, white, 20 82 000 0003
– 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	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		
Ha-VIS preLink® RJ45 terminal module AWG 22/23, yellow <sup>1)</sup> AWG 26/27, white <sup>1)</sup>	20 82 000 0001 20 82 000 0003		
Ha-VIS preLink® assembly tool	20 82 000 9901		



Mating face



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



Identification

Part number

Drawing

Dimensions in mm

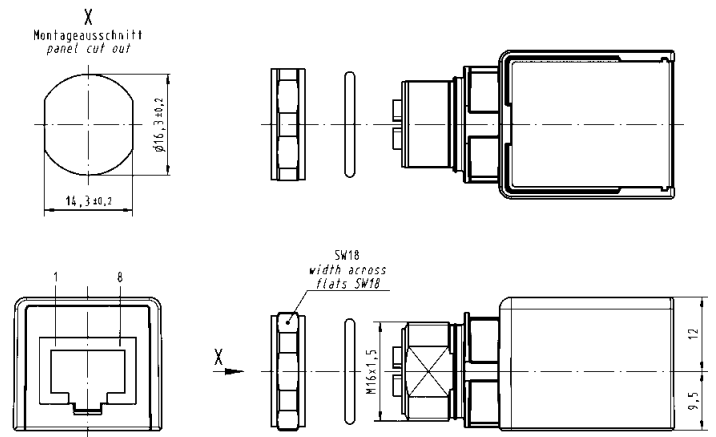
**har-speed M12  
Adapter M12-RJ45**



straight, Cat. 6A

Panel thickness  
min. 2.1 mm  
max. 4.5 mm

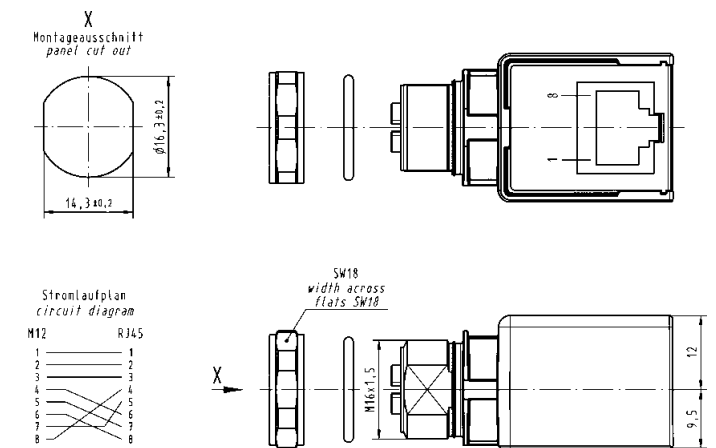
21 03 381 2800



angled, Cat. 6A

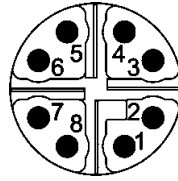
Panel thickness  
min. 2.1 mm  
max. 4.5 mm

21 03 381 4800





Mating face



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



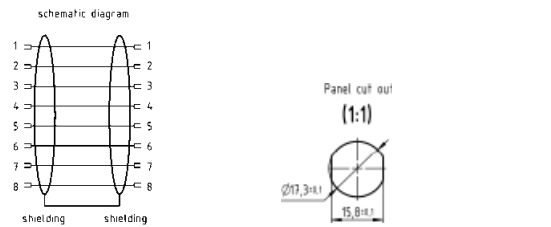
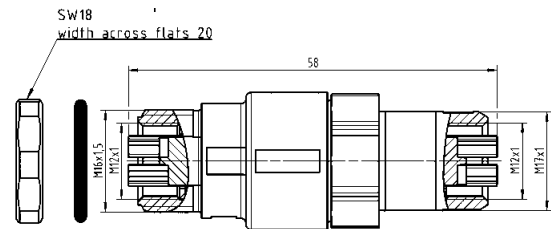
Circular Connectors

Identification      Part number      Drawing      Dimensions in mm

M12 Gender changer, Cat. 6A

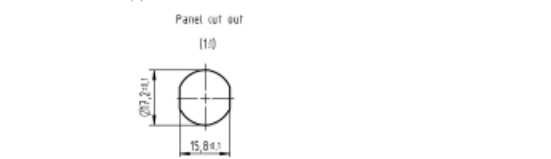
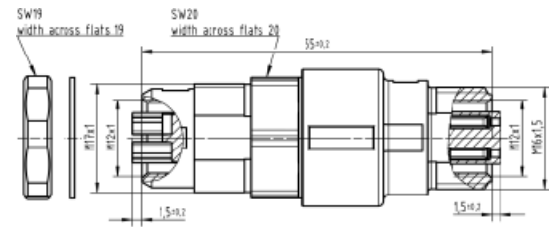


21 03 381 6815



M12 Gender changer, Cat. 5  
Female-Female  
4 poles, D-coding  
8 poles, X-coding

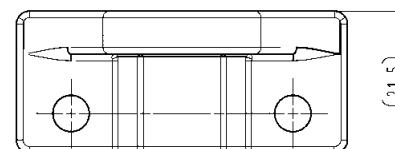
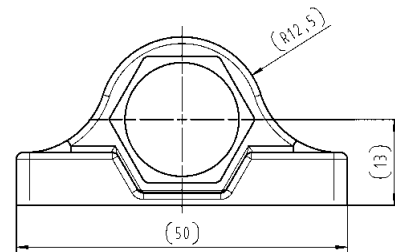
21 03 381 6402



Wall bracket

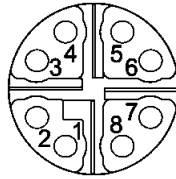


21 01 000 0036





Mating face



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



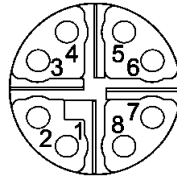
Circular Connectors

Identification	Part number	Drawing	Dimensions in mm
<p><b>har-speed M12 PCB adapter</b> Female, X-coding, straight, Cat. 6<sub>A</sub> for front mounting</p> <p><b>Packaging: 60 pieces incl. housing</b></p> <p><b>Packaging: 1 piece incl. housing</b></p>	<p>21 03 381 2802</p> <p>21 03 381 2813</p>		
<p><b>har-speed M12 PCB adapter</b> Female, X-coding, straight, Cat. 5 for front mounting</p> <p><b>Packaging: 60 pieces incl. housing</b></p> <p><b>Packaging: 1 piece incl. housing</b></p>	<p>21 03 381 2803</p> <p>21 03 381 2814</p>		
<p><b>har-speed M12 PCB adapter</b> Female, X-coding, angled, Cat. 6<sub>A</sub> for front mounting</p> <p><b>Packaging: 30 pieces incl. housing</b></p> <p><b>Packaging: 1 piece incl. housing</b></p>	<p>21 03 381 4802</p> <p>21 03 381 4810</p>		





Mating face



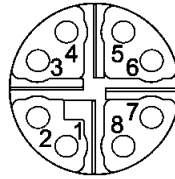
X-coding  
Mating face  
acc. to IEC 61076-2-109



Identification	Part number	Drawing	Dimensions in mm
<p><b>har-speed M12 PCB adapter</b> Female, X-coding, straight, Cat. 6<sub>A</sub> for rear mounting</p> <p><b>Packaging: 60 pieces incl. housing</b></p> <p><b>Packaging: 1 piece incl. housing</b></p>	<p>21 03 381 2804</p> <p>21 03 381 2811</p>		
<p><b>har-speed M12 PCB adapter</b> Female, X-coding, straight, Cat. 5 for rear mounting</p> <p><b>Packaging: 60 pieces incl. housing</b></p> <p><b>Packaging: 1 piece incl. housing</b></p> <p><b>Packaging: 60 piece incl. housing</b></p>	<p>21 03 381 2805</p> <p>21 03 381 2812</p> <p>21 03 381 2809</p>		
<p><b>har-speed M12 PCB adapter</b> Female, X-coding, angled, Cat. 6<sub>A</sub> for rear mounting</p> <p><b>Packaging: 30 pieces incl. housing</b></p> <p><b>Packaging: 1 piece incl. housing</b></p>	<p>21 03 381 4804</p> <p>21 03 381 4809</p>		



Mating face



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



Circular Connectors

Identification      Part number      Drawing      Dimensions in mm

**har-speed M12  
PCB adapter**

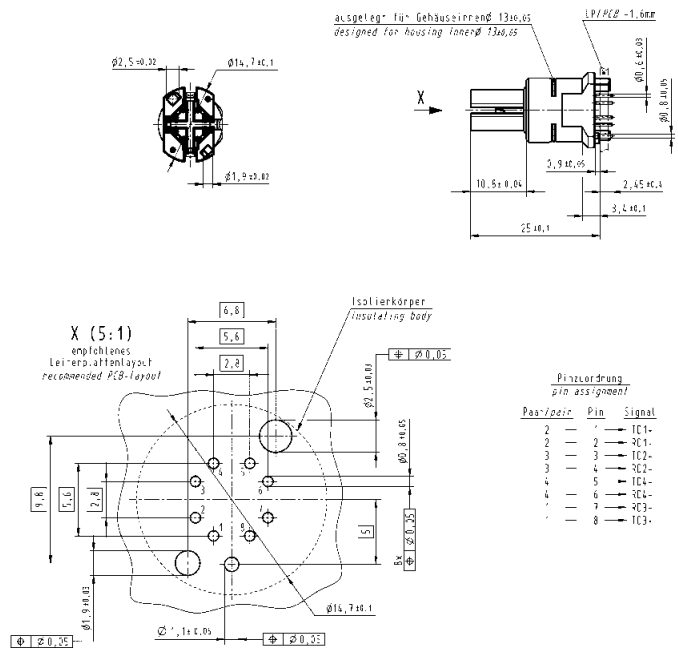
**Packaging: 60 pieces in a tray  
Order housing  
separately**

Female  
8 poles, X-coding  
Cat. 6A

Female  
8 poles, X-coding  
Cat. 5

21 03 381 2806

21 03 381 2807



**Housing**



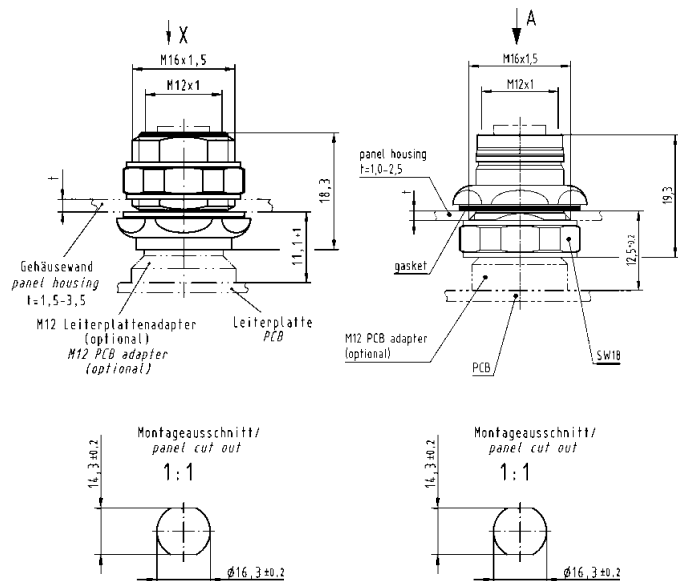
**Packaging: 10 pieces in a tube**

for rear mounting


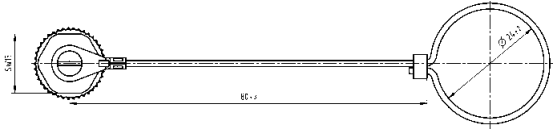

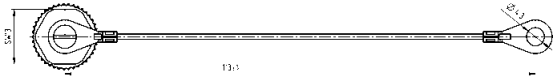

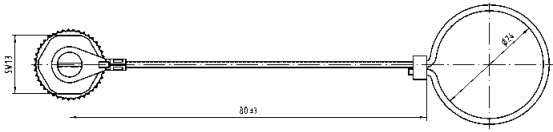



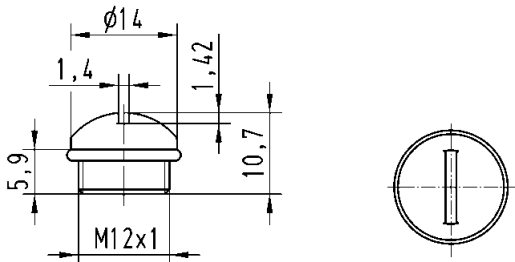
for front mounting

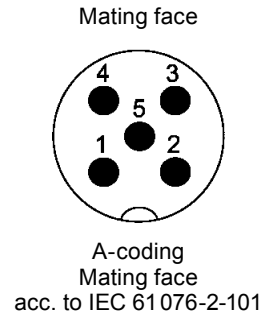
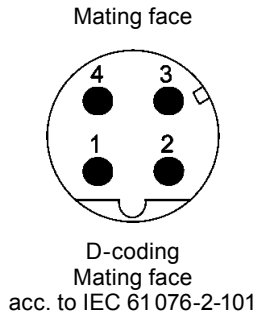
21 03 301 2000

21 03 301 2003



Identification	Part number	Drawing																	
<p>Crimping tool for <i>har-speed</i> M12</p>	09 99 000 0501																		
<p>Accessories <i>har-speed</i> M12</p> <p>Locator</p> <p>Single contacts (500 mating cycles)</p> <p><i>har-speed</i> M12 contacts AWG 28-24 / 0.08-0.22 mm<sup>2</sup></p> <p><i>har-speed</i> M12 contacts AWG 26-23 / 0.13-0.25 mm<sup>2</sup></p>	<p>09 99 000 0525</p> <p>21 01 100 9014</p> <p>21 01 100 9019</p>	<p><i>har-speed</i> contacts</p> <table border="1"> <thead> <tr> <th>Part number</th> <th>AWG</th> <th>Tool settings</th> </tr> </thead> <tbody> <tr> <td rowspan="3">21 01 100 9014</td> <td>28</td> <td>3</td> </tr> <tr> <td>26</td> <td>4</td> </tr> <tr> <td>24</td> <td>5</td> </tr> <tr> <td rowspan="3">21 01 100 9019</td> <td>26</td> <td>4</td> </tr> <tr> <td>24</td> <td>5</td> </tr> <tr> <td>23</td> <td>5</td> </tr> </tbody> </table>	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
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																	
<p>Accessories M12</p> <p>Lock nut</p>	21 01 000 0018																		
<p>M12 dynamometric screwdriver Tightening torque 0.6 Nm</p> <p>for M12 Slim design SW 15</p>	09 99 000 0646																		

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

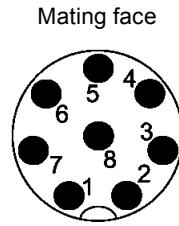


## Applications / Advantages

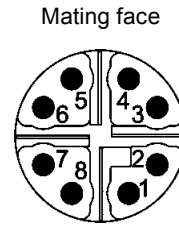
- M12 PushPull for a fast and vibration-free connection
- Simple assembly without tools
- You can hear it click into place
- Suitable for signal and data transmission

Identification	Part number	Drawing	Dimensions in mm
<p>M12 PushPull Slim design</p> <p>Male straight version 4 poles, D-coding, IP54 Cable diameter: 5.7 - 8.8 mm</p>	21 03 881 1430		
<p>M12 PushPull Slim design</p> <p>Male straight version 5 poles, A-coding, IP54 Cable diameter: 5.7 - 8.8 mm</p>	21 03 821 1530		

# M12 PushPull Connector



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



X-coding  
Mating face  
acc. to IEC 61076-2-119



Circular Connectors

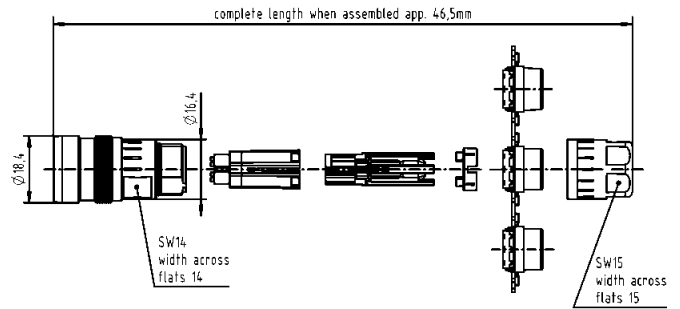
Identification      Part number      Drawing      Dimensions in mm

## M12 PushPull Slim design



Male  
straight version  
8 poles, A-coding, IP54  
Cable diameter: 5.7 - 8.8 mm

21 03 821 1830



## M12 PushPull Slim design

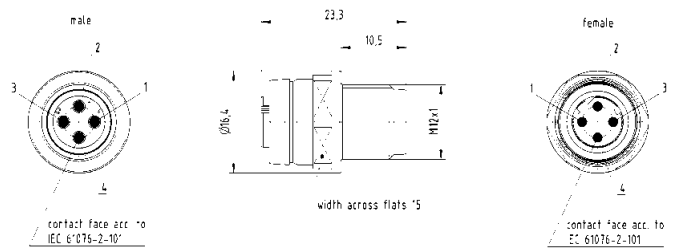


Male  
straight version  
8 poles, X-coding, IP54  
Cable diameter: 5.7 - 8.8 mm

21 03 881 1830

## M12 PushPull adapter

21 03 381 2403

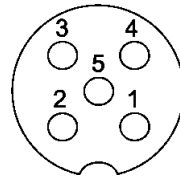


The adapter can be used to bring a PushPull feature on a standard receptacle housing without PushPull feature.

# M12 PushPull PCB connector



Mating face



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



## Identification

## Part number

## Drawing

## Dimensions in mm

M12 PCB adapter, shielded



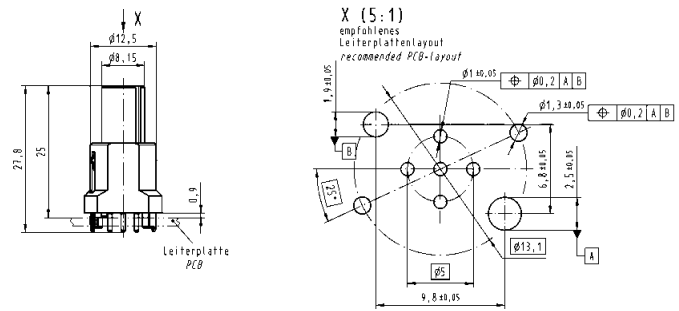
**Packaging: 60 pieces in a tray**  
**Order housing separately**

Female  
5 poles, A-coding

8 poles, A-coding

21 03 321 2518\*

21 03 321 2818\*

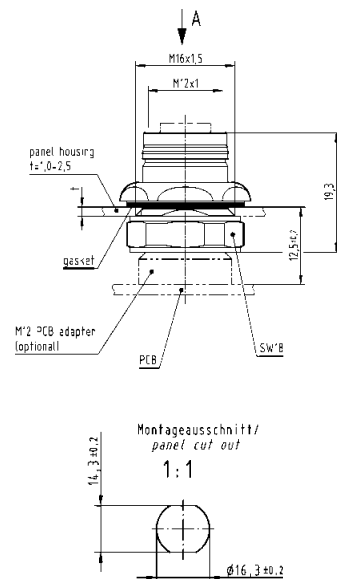


Housing for PushPull locking



for front mounting

21 03 301 2003











Identification                      Part number                      Drawing

Crimping tool  
for M12 PushPull

09 99 000 0501



Accessories M12 PushPull

Locator

for D-Sub contacts

09 99 000 0531

for contact 21 01 100 9020

61 03 600 0023

for *har*-speed contacts

09 99 000 0525



D-Sub single contacts  
(500 mating cycles)

turned male contacts

AWG 22 - 18 / 0.33 - 0.82 mm<sup>2</sup>  
AWG 24 - 20 / 0.25 - 0.52 mm<sup>2</sup>  
AWG 26 - 22 / 0.13 - 0.33 mm<sup>2</sup>  
AWG 28 - 24 / 0.09 - 0.25 mm<sup>2</sup>

09 67 000 3576  
09 67 000 8576  
09 67 000 5576  
09 67 000 7576



turned male contact  
for 8 pole connector,  
A-coding, AWG 26 - 22

21 01 100 9020

Single contacts  
(500 mating cycles)

*har*-speed M12 contacts  
AWG 28-24 / 0.08-0.22 mm<sup>2</sup>

21 01 100 9014



*har*-speed M12 contacts  
AWG 26-23 / 0.13-0.25 mm<sup>2</sup>

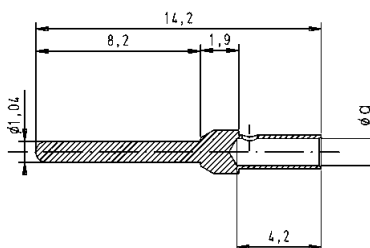
21 01 100 9019

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

*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



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

Identification

Part number

Drawing

M12  
dynamometric screwdriver


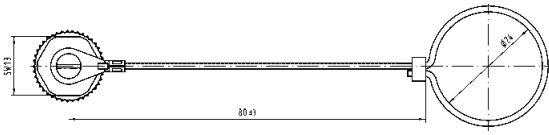

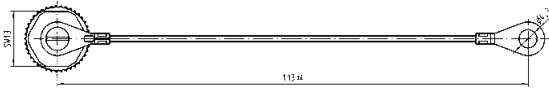

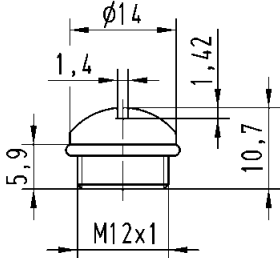
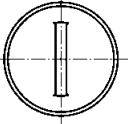
Tightening torque 0.6 Nm

for M12 Slim design

SW 15

09 99 000 0646



Identification	Part number	Drawing	Dimensions in mm
<p><b>Cap metal M12</b> for IP65 / IP67 M12 metal cap for female side with cord</p> 	<p>21 01 000 0030</p>		
<p><b>Cap metal M12</b> for IP65 / IP67 M12 metal cap for female side with cable clip</p> 	<p>21 01 000 0031</p>		
<p><b>Cap M12</b> for IP65 / IP67 Seals material Viton Plastic cap for female</p> 	<p>21 01 000 0003</p>		



**Specifications** IEC 60352-4  
IEC 60068-2-52:1996, severity level 4



## Technical characteristics M12 INOX

Type M12 INOX V4A	<b>HARAX® M12-L</b> 4 poles	M12 Crimp
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### General data

Conductor cross section	0.34 - 0.75 mm <sup>2</sup> AWG 22 - 18	0.14 - 0.75 mm <sup>2</sup> AWG 26 - 18
Diameter of individual strands	≥ 0.1 mm	X
Conductor insulation material	PVC	X
Conductor diameter	1.6 - 2.0 mm 2.0 - 2.6 mm	2.0 - 2.3 mm
Cable diameter	6 - 8 mm	4.5 - 8.8 mm
Temperature range	-40 °C ... +85 °C	-40 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C	-5 °C ... +50 °C
Degree of protection	IP65 / 67	IP65 / IP66 / IP67
Mating cycles	100	500
Tightening torque connector / hexagonal wrench	0.6 Nm / SW 17	0.6 Nm / SW 17

### Electrical characteristics

Rated current	6 A	4 A
Rated voltage	50 V	250 V
Rated impulse voltage	1.5 kV	1.5 kV
Contact resistance	10 mΩ	10 mΩ
Insulation resistance	10 <sup>8</sup> Ω	10 <sup>8</sup> Ω
Pollution degree	3	3
Overvoltage category	3	3
Isolation group	1	1

### Materials

Contact material	Brass	Brass
Contact plating	Gold	Gold
Contact carrier material	PA unreinforced	PA
Housing material	V4A	V4A

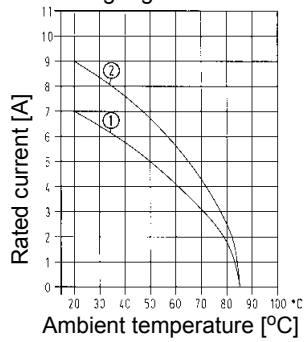
## Technical characteristics M12 INOX

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

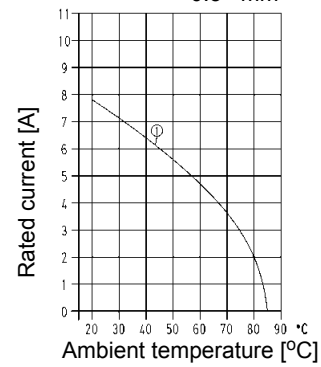
Control and test procedures according to DIN IEC 60512-5.

M12-L  
4 poles

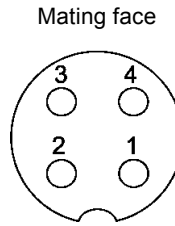
1 = Wire gauge 0.34 mm<sup>2</sup>  
2 = Wire gauge 0.75 mm<sup>2</sup>



M12, Crimp 1 = Wire gauge 0.34 mm<sup>2</sup> /  
0.5 mm<sup>2</sup>







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



## Applications / Advantages

- Designed for rough outdoor applications in harsh environments
- Material V4A
- Available with crimp resp. *HARAX*® rapid termination
- Extreme robust design, quick assembly

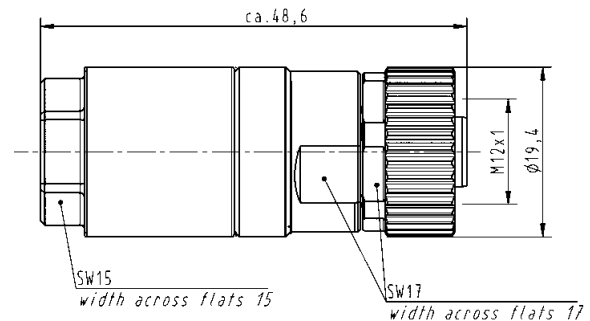
Identification	Part number	Drawing	Dimensions in mm
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*HARAX*® M12-L INOX



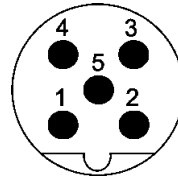
Female, A-coding,  
straight version  
4 poles

21 03 222 2435

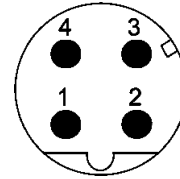




Mating face



B-coding



D-coding

Mating faces acc. to IEC 61076-2-101



Identification

Part number

Drawing

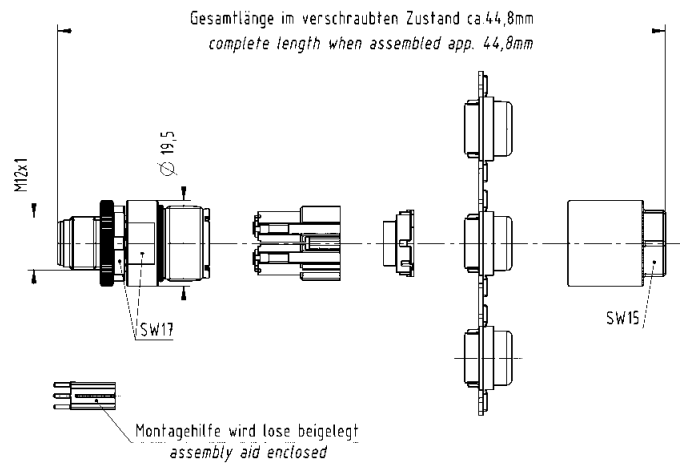
Dimensions in mm

M12-L Crimp INOX



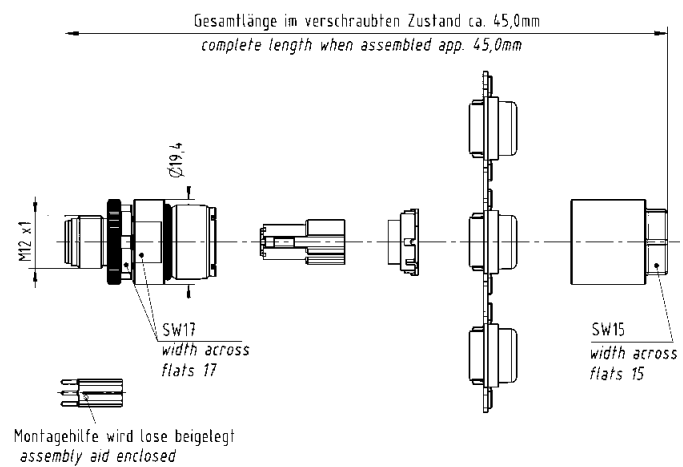
Male, B-coding,  
straight version  
5 poles

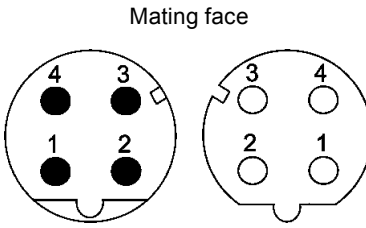
21 03 841 1535



Male, D-coding,  
straight version  
4 poles

21 03 882 1435





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



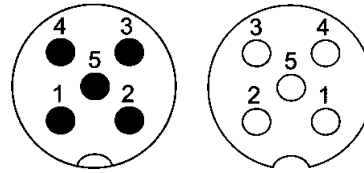
## Applications / Advantages

- 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
<p>M12 connector with PMA connection for PVC tube NW10</p> <p>Male 4 poles, D-coding</p>	21 03 882 1411		
<p>M12 connector with PMA connection for PVC tube NW10</p> <p>Female 4 poles, D-coding</p>	21 03 882 2411		



Mating face



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



Identification

Part number

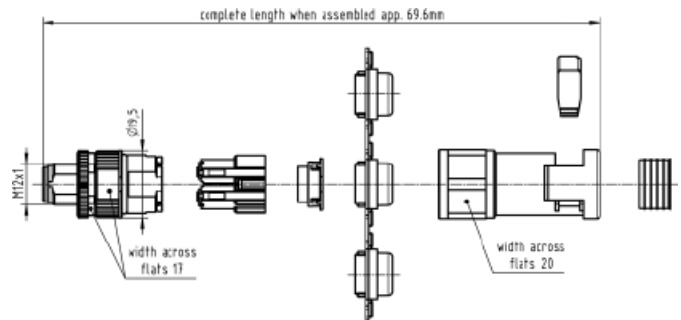
Drawing

Dimensions in mm

M12 connector  
with PMA connection  
for PVC tube NW10



21 03 812 1511

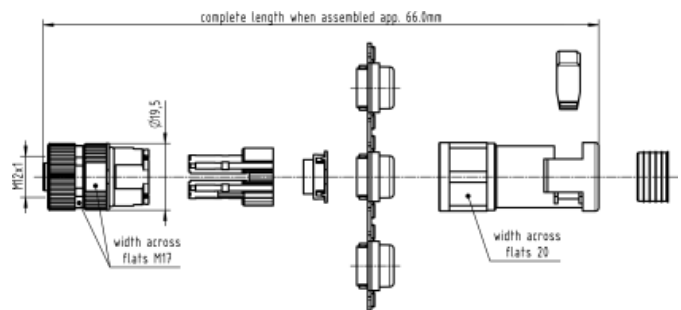


Male  
5 poles, A-coding

M12 connector  
with PMA connection  
for PVC tube NW10



21 03 812 2511



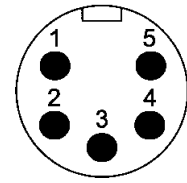
Female  
5 poles, A-coding

**Specifications** IEC 60352-4  
DIN 61984

**Approval** , VDE



Mating face



## Technical characteristics 7/8" HARAX®

Type	7/8" HARAX®
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### General data

Conductor cross section	0.75 - 1.5 mm <sup>2</sup> AWG 18-16
Diameter of individual strands	≥ 0.15 mm
Conductor insulation material	PVC, PP, TPE
Conductor diameter	≤ 2.8 mm
Cable diameter	6.8 - 9.5 mm (black) 9 - 12.5 mm (grey)
Temperature range	-40 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C
Degree of protection	IP65 / IP67
Mating cycles	100
Recommended tightening torque / Hexagonal wrench	1.5 Nm / SW 22

### Electrical characteristics

Rated current	10 A
Rated voltage	230 V / 400 V
Rated impulse voltage	4.8 kV
Contact resistance	10 mΩ
Insulation resistance	10 <sup>8</sup> Ω
Pollution degree	3
Overvoltage category	3
Isolation group	1

### Materials

Contact material	Copper alloy
Contact plating	Gold
Contact carrier material	TPU, PA
Housing material	TPU, zinc die-cast, PA

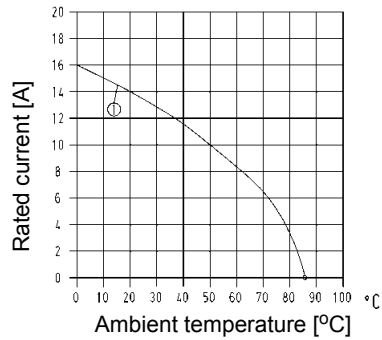
## Technical characteristics 7/8" HARAX®

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

Control and test procedures according to DIN IEC 60512-5.

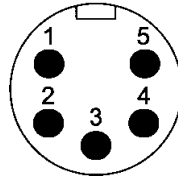
7/8"

1 = Wire gauge 0.75 mm<sup>2</sup> /  
1.5 mm<sup>2</sup>




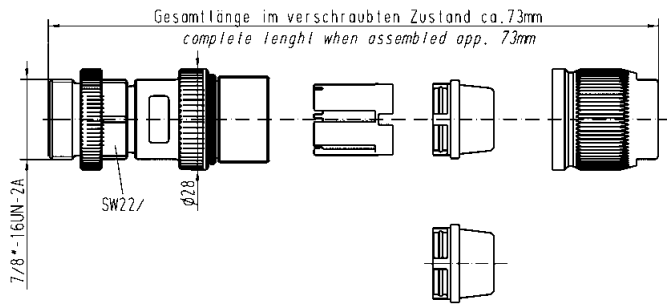


Mating face



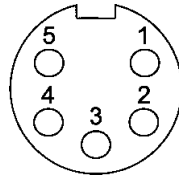
### Applications / Advantages

- The reliable connector for power applications
- Patent HARAX® fast termination
- Overmoulded system cables in various lengths
- Robust design, quick assembly

Identification	Part number	Drawing	Dimensions in mm
<p>7/8" HARAX® Male</p> 	<p>21 04 116 1505</p>	 <p>Gesamtlänge im verschraubten Zustand ca. 73mm complete length when assembled app. 73mm</p> <p>SW22/</p> <p>∅28</p> <p>7/8" - 16UN - 2A</p>	



Mating face



Identification

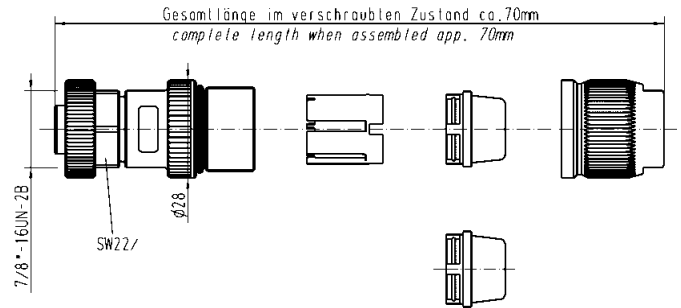
Part number

Drawing

Dimensions in mm

7/8" HARAX® Female

21 04 116 2505



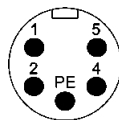




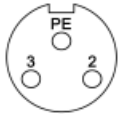
Male, 2 + PE



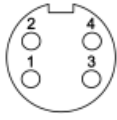
Male, 4 poles



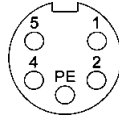
Male, 4 + PE



Female, 2 + PE



Female, 4 poles



Female, 4 + PE



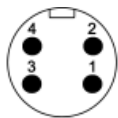
## Technical characteristics

### 7/8" system cables

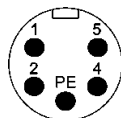
	3 poles (2+PE)		4 poles		5 poles (4+PE)	
	PVC	PUR	PVC	PUR	PVC	PUR
Rated voltage	max. 300 V AC/DC	max. 300 V AC/DC	max. 300 V AC/DC	max. 300 V AC/DC	max. 300 V AC/DC	max. 300 V AC/DC
Rated current / contact	max. 10 A at +40 °C	max. 10 A at +40 °C	max. 10 A at +40 °C	max. 10 A at +40 °C	max. 10 A at +40 °C	max. 10 A at +40 °C
Screw locking	7/8", self securing	7/8", self securing	7/8", self securing	7/8", self securing	7/8", self securing	7/8", self securing
Temperature range (working and storage)	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C	-30 °C ... +80 °C
Degree of protection	IP67	IP67	IP67	IP67	IP67	IP67
Number of wires / wire gauge	3 x 1.5 mm <sup>2</sup>	3 x 1.5 mm <sup>2</sup>	4 x 1.5 mm <sup>2</sup>	4 x 1.5 mm <sup>2</sup>	5 x 1.5 mm <sup>2</sup>	5 x 1.5 mm <sup>2</sup>
Conductor insulation	PVC (bn, bu, gn/ye)	PP (bn, bu, gn/ye)	PVC (bn, wh, bu, bk)	PP (bn, wh, bu, bk)	PVC (bu, bk, wh, bn, gn/ye)	PP (bu, bk, wh, bn, gn/ye)
Arrangement of insulated strands	84 x Ø 0.15 mm	84 x Ø 0.15 mm	84 x Ø 0.15 mm	84 x Ø 0.15 mm	84 x Ø 0.15 mm	84 x Ø 0.15 mm
Sheath	PVC	PUR (UL, CSA)	PVC	PUR (UL, CSA)	PVC	PUR (UL, CSA)
Sheath colour	grey	black	grey	black	grey	black
Outer diameter	Ø 7.0 ± 0.2 mm	Ø 7.0 ± 0.2 mm	Ø 7.8 ± 0.2 mm	Ø 7.1 ± 0.2 mm	Ø 8.5 ± 0.2 mm	Ø 7.8 ± 0.2 mm
Useable as trailing cable	no	yes	no	yes	no	yes
Halogen free acc. to	–	DIN VDE 0472 part 815	–	DIN VDE 0472 part 815	–	DIN VDE 0472 part 815
Flame retardant acc. to	DIN EN 60332-1-2	DIN EN 60332-1-2	DIN EN 60332-1-2	cUL20549	DIN EN 60332-1-2	cUL20549
Oil-resistant	IEC 60811-2-1	DIN EN 60811-2-1	–	–	–	–
	<p>PE Loading-Plan: PE green-yellow 2 brown 3 blue</p>	<p>2 4 1 3 Loading-Plan: 1 brown 2 white 3 blue 4 black</p>	<p>5 1 2 4 3 PE Loading-Plan: 1 black 2 blue PE green-yellow 4 brown 5 white</p>			



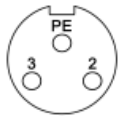
Male, 2 + PE



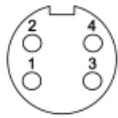
Male, 4 poles



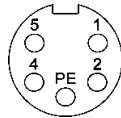
Male, 4 + PE



Female, 2 + PE



Female, 4 poles



Female, 4 + PE



## Part number definition



- Connector 1**
- 96 Male straight
  - 97 Female straight
  - 98 Male angled
  - 99 Female angled

- Connector 2**
- 00 No connector
  - 96 Male straight
  - 97 Female straight
  - 98 Male angled
  - 99 Female angled

- Number of contacts**
- 3 2 + PE
  - 4 4 poles
  - 5 4 + PE

- Cable material**
- 93 PVC (2 + PE)
  - 94 PUR (2 + PE)
  - 95 PVC (4 poles)
  - 96 PUR (4 poles)
  - 97 PVC (4 + PE)
  - 98 PUR (4 + PE)

- Preferred length\***
- 005 0.5 m
  - 010 1.0 m
  - 015 1.5 m
  - 020 2.0 m
  - 050 5.0 m
  - 075 7.5 m
  - 100 10.0 m

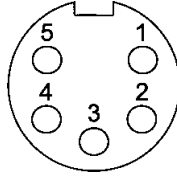
\* Other length on request



# 7/8" Panel feed-through



Mating face



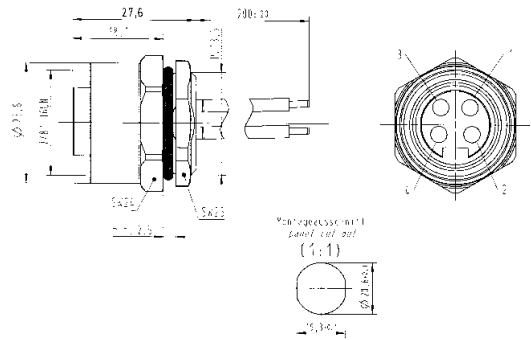
Circular Connectors

Identification	Part number	Drawing	Dimensions in mm
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**7/8" Panel feed-through**  
20 cm conductors, AWG 18, 1 mm<sup>2</sup>, 4 poles

Female

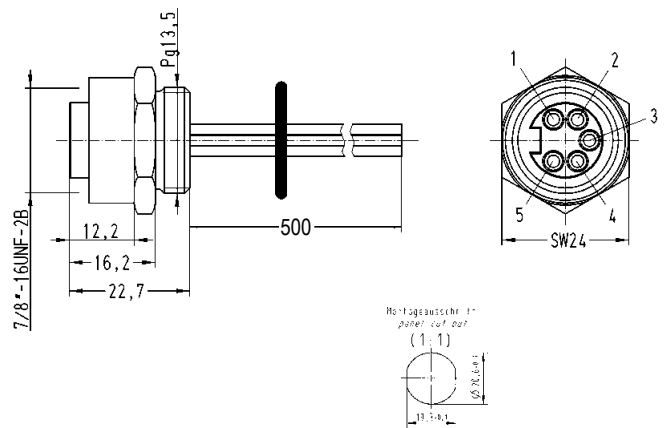
21 04 316 2400



**7/8" Panel feed-through**  
50 cm conductors, AWG 18, 1 mm<sup>2</sup>, 5 poles

Female

21 04 316 2505

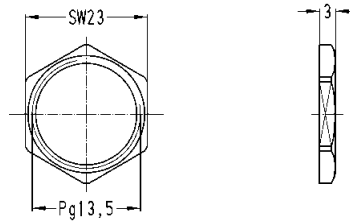


Identification	Part number	Drawing	Dimensions in mm
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Lock nut Pg 13.5  
nickel plated



21 01 000 0020



7/8"  
dynamometric screwdriver  
Tightening torque 1.5 Nm

for 7/8" SW 23

09 99 000 0395





**Specifications** IEC 60352-4  
DIN 61984

**Approval** , VDE



## Technical characteristics Panel feed-through

<b>Type</b>	<b>HARAX® Pg 13.5/M20 Panel feed-through</b>
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### General data

Conductor cross section	0.75 - 1.5 mm <sup>2</sup> AWG 18 - 16
Diameter of individual strands	≥ 0.2 mm
Conductor insulation material	PVC, PP, TPE
Conductor diameter	≤ 2.8 mm
Cable diameter	6 - 9 mm
Temperature range	-25 °C ... +85 °C
Temperature during connection	-5 °C ... +50 °C
Degree of protection	IP67
Mating cycles	100
Recommended tightening torque	8 Nm

### Electrical characteristics

Rated current	16 A
Rated voltage	230 V / 400 V
Rated impulse voltage	4 KV
Contact resistance	10 mΩ
Insulation resistance	10 <sup>8</sup> Ω
Pollution degree	3
Overvoltage category	3
Isolation group	1

### Materials

Contact material	Copper alloy
Contact plating	Gold
Contact carrier material	TPU, PA
Housing material	TPU, PA

## Technical characteristics Panel feed-through

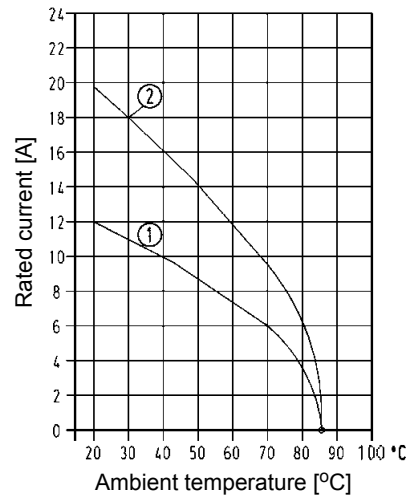
**Current carrying capacity** The current carrying capacity is limited by maximum temperature of materials for inserts and contacts including terminals. The current capacity-curve is valid for continuous, not interrupted current-loaded contacts of connectors when simultaneous power on all contacts is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

Control and test procedures according to DIN IEC 60512-5.

**Pg 13.5**  
3 poles

1 = Wire gauge  
0.75 mm<sup>2</sup>

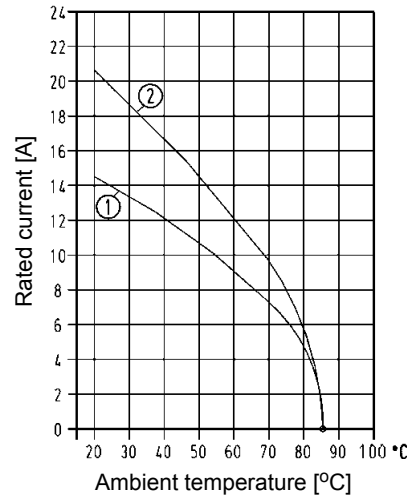
2 = Wire gauge  
1.5 mm<sup>2</sup>



**Pg 13.5 / M20**  
4 poles

1 = Wire gauge  
0.75 mm<sup>2</sup>

2 = Wire gauge  
1.5 mm<sup>2</sup>







Identification	Part number	Drawing	Dimensions in mm
<p>Termination element M12 HARAX® Pg 9 3 contacts Screw cap, splice ring, seal</p>	<p>21 01 010 0001</p>		
<p>Termination element M12 HARAX® Pg 9 4 contacts Screw cap, splice ring, seal</p>	<p>21 01 010 0006</p>		
<p>Lock nut Pg 9</p> <p>Lock nut Pg 13.5, SW 27</p> <p>Lock nut Pg 13.5, SW 24</p>	<p>21 01 000 0008</p> <p>21 01 000 0007</p> <p>21 01 000 0039</p>		



## Advantages

- IP65 / IP67 RJ45 connector with toggle locking acc. to IEC 61 076-3-106 variant 1
- Robust zinc die cast housing, nickel plated
- Vibration and shock resistant
- Min. 500 mating cycles
- Shielded and unshielded versions
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- ODVA approval

## Technical characteristics device side

Han-Max®	
Connector type	RJ45 acc. to IEC 60 603-7
Number of contacts	8
Transmission performance	Category 5 / class D up to 100 MHz acc. to ISO/IEC 11801:2002; EN 50173-1
Transmission rate	10/100/1.000 Mbit/s
Shielding	unshielded / shielded
Mounting	field-assembly
Termination	with IDC contacts
Connectable cables	
- Conductor cross section	AWG 22 ... AWG 24 solid / stranded
Temperature range	-25 °C ... +70 °C

## Technical characteristics cable side

	Han-Max®	Han-Max® RJ Industrial	Han-Max® RJ Industrial 10G
Connector type	RJ45 acc. to IEC 60 603-7	RJ45 acc. to IEC 60 603-7	RJ45 acc. to IEC 60 603-7
Number of contacts	8	4	8
Transmission performance	Category 5 / class D up to 100 MHz acc. to ISO/IEC 11801:2002; EN 50173-1	Category 5 / class D up to 100 MHz acc. to ISO/IEC 11801:2002; EN 50173-1	Category 6 / class E <sub>A</sub> up to 250 MHz acc. to ISO/IEC 11801:2002; EN 50173-1
Transmission rate	10/100/1.000 Mbit/s	10/100 Mbit/s	10/100 Mbit/s resp. 1/10 Gbit/s
Shielding	unshielded / shielded	fully shielded, 360° shielding contact	fully shielded, 360° shielding contact
Mounting	field-assembly	no tools needed, field-assembly	no tools needed, field-assembly
Termination	with piercing contacts	with IDC contacts	with IDC contacts
Connectable cables			
- Conductor cross section	AWG 26/7 ... AWG 24/7 stranded	AWG 24/7 ... AWG 22/7 stranded AWG 23/1 ... AWG 22/1 solid	AWG 27/7 ... AWG 22/7 stranded AWG 24/1 ... AWG 22/1 solid
- Conductor diameter	max. 1.0 mm (including insulation)	max. 1.6 mm (including insulation)	max. 1.6 mm (including insulation)
- Cable diameter	4 ... 8 mm	4 ... 8 mm	4 ... 8 mm
Temperature range	-25 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C



Device side

Identification	Part number	Drawing	Dimensions in mm
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<p><b>Han-Max®</b> RJ45 panel feed-through unshielded version (UTP)</p> 	<p>09 15 300 0301</p>		<p>Panel cut out for max. Panel thickness 2.3 mm</p> 
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<p><b>Han-Max® MS</b> RJ45 panel feed-through unshielded version (UTP)</p> 	<p>09 15 300 0311</p>		<p>panel feed through</p>
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<p><b>Han-Max®</b> Protection cover Device side</p> 	<p>09 15 300 5411</p>		
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Cable side

Identification	Part number	Drawing	Dimensions in mm
<p><b>Han-Max®</b> Connector Cat. 5, 8-poles, piercing termination</p> <p>unshielded version (UTP)</p>  <p>fully shielded version (STP)</p>	<p>09 15 300 0401</p> <p>09 15 300 0402</p>		
<p><b>Han-Max® RJ Industrial</b> Connector Cat. 5, 4-poles, IDC termination</p> 	<p>09 15 300 0412</p>		
<p><b>Han-Max® RJ Industrial 10G</b> Connector Cat. 6, 8-poles, IDC termination</p> 	<p>09 15 300 0431</p>		
<p><b>Han-Max® Protection cover</b> Cable side</p> 	<p>09 15 300 5401</p>		