



Superior Clamping and Gripping



## Product Information

Magnetic gripper EMH RP 084

## Compact. Strong. Fast.

### Magnetic gripper EMH

Electro-permanent magnetic gripper for energy-efficient handling of ferromagnetic workpieces with integrated electronics and feedback function

#### Field of application

Universal compact gripper for large diversity of parts in clean to slightly contaminated work environment

#### Advantages – Your benefits

**High holding forces at lowest space** for reliable part handling in compact machines

**Integrated electronics** Compact design, as no additional controller is required

**Low weight** for high dynamics in challenging applications

**Reliable holding force maintenance** to ensure process reliable operation even in scenarios with emergency stop

**The gripping force can be adjusted in four stages** ensures gripping of various workpieces

**Control via 24 V power supply** saves energy and simplifies the connection and the wiring

**Workpiece accessibility from five sides free from interfering contours** by unnecessary gripper fingers

**Response on magnetization condition and workpiece presence** saves time and simplifies the programming

**NEW:** Sizes EMH-MP and EMH-DP as a solution for special requirements



Sizes  
Quantity: 6



Weight  
1 .. 8 kg



Max. workpiece  
weight  
70 kg



Max. magnetic surface  
81.97 cm<sup>2</sup>

## Functional description

The function of the magnetic gripper bases on the combination of AlNiCo and neodymium magnets. The magnetic flux of the AlNiCo magnets passes the neodymium magnet in the deactivated state, and closes the magnetic circuit

over the gripper base body made of steel. To activate the system, an electric current pulse is conducted through the coil, which reverses the polarity of the AlNiCo magnets accordingly.



- ① **Connecting plug for PLC**  
communication via digital I/O
- ② **Connection plug**  
for power supply
- ③ **Control electronics**  
integrated control and power electronics

- ④ **LED display**
- ⑤ **Copper coil**  
for pole reversal of the AlNiCo-magnets
- ⑥ **Polarity reversible AlNiCo-magnet**  
surrounded by an electromagnetic coil
- ⑦ **Non-pole reversing neodymium permanent magnets**  
lead the magnetic flux via the workpiece

### Detailed functional description

#### Component presence



The presence sensor detects the presence of a component. After magnetization, an internal sensor measures the change in the magnetic field. After exceeding a corresponding threshold value, the presence of the workpiece is output.

- ① Magnetic gripper EMH RP
- ② Workpiece
- ③ Magnetic field lines

#### Process reliability



The EMH magnetic gripper ensures safe and reliable operation. By changing the polarity of the permanent magnets through short current pulse, the magnetic gripper remains in the selected status, even in case of a power failure or emergency stop.

- ① Magnetic gripper EMH RP
- ② Workpiece
- ③ Sheet metal stack
- ④ Emergency stop

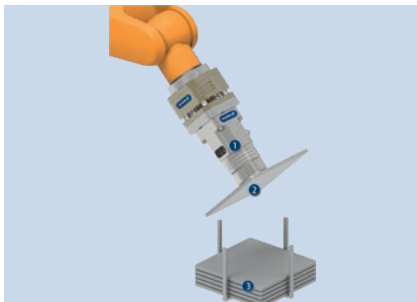
#### Gripping of round components



The EMH magnetic grippers can also be equipped with pole extensions to suit the workpiece. Special pole extensions are available for round components, for example, with prismatic or even with concave contours. The pole extensions are supplied with mounting material.

- ① Magnetic gripper EMH MP
- ② PVL pole extension
- ③ Workpiece

#### Variable holding force control



The gripping force can be adjusted in four stages via digital inputs. These enable the gripping and separation of a wide variety of workpieces. Stage 1: 15% holding force Stage 2: 25% holding force Stage 3: 35% holding force Stage 4: 100% holding force

- ① Magnetic gripper EMH RP
- ② Workpiece
- ③ Sheet metal stack



## General notes about the series

**Operating principle:** Magnetization of permanent magnets

**Housing material:** Aluminum/steel

**Base jaw material:** Steel

**Actuation:** Electrical current pulse for activation and deactivation of the system

**Warranty:** 24 months

**Service life characteristics:** on request

**Scope of delivery:** Assembly and Operating Manual with Declaration of Incorporation, centering sleeves

**Layout or control calculation:** Verifying the sizing of the selected unit is necessary, since otherwise overloading can result. Please contact us for assistance.

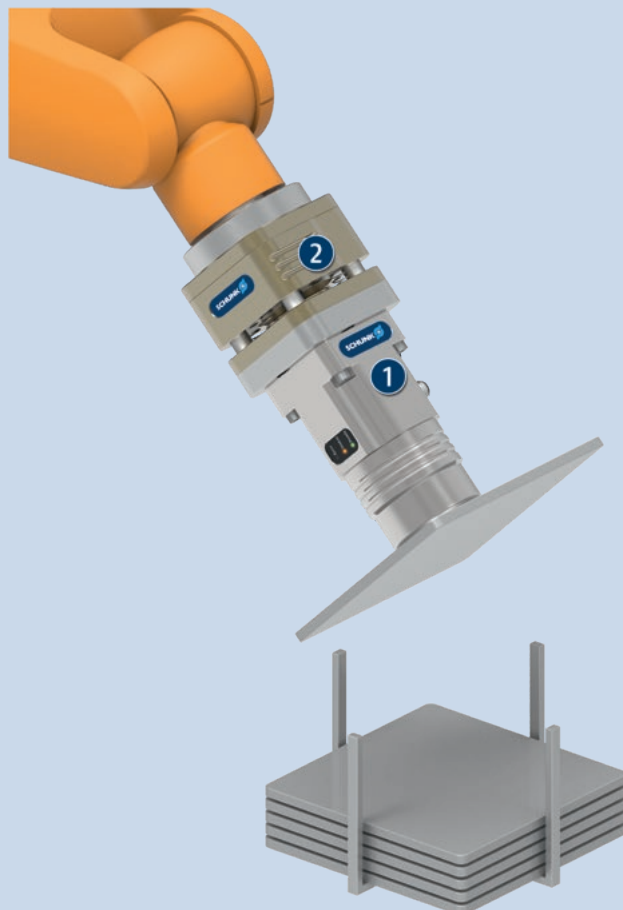
**Activation time:** The activation time is the time required to reverse the polarity of the permanent magnets.

**Ambient conditions:** The modules are primarily designed for the use in clean to slightly contaminated environments. Please note that the life time of the modules can shorten if they are used in harsh ambient conditions, and that SCHUNK cannot assume liability in such cases.

## Application example

Magnetic gripping unit for separating and handling of sheets.

- ① Magnetic gripper EMH
- ② Compensation Unit AGE-Z



## SCHUNK offers more ...

The following components make the product even more productive – the suitable addition for the highest functionality, flexibility, reliability, and controlled production.



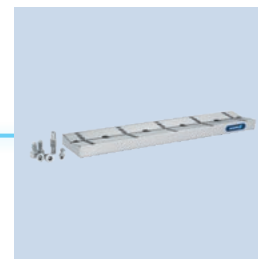
Compensation unit



Tolerance compensation unit



Quick change system



Pole Extensions



Connection cables

① For more information on these products can be found on the following product pages or at [schunk.com](https://www.schunk.com).

## Options and special information

**Pole extension:** The use of pole extensions alters the magnetic flux and can affect the holding force if incorrectly designed. Pole extensions also affect component detection. Workpieces may no longer be detected.

**Heating:** Each activation increases the internal temperature of the product. Overheating reduces the magnetic characteristics and can destroy the product. The number of activations per minute must be adjusted so that the maximum permissible product temperature is not reached.

**Material dependence:** The product is designed to hold almost all ferromagnetic materials. The achievable holding force depends, among other things, on the respective workpiece material. Accordingly, with some ferromagnetic materials a reduction in the nominal holding force can be expected.

**Material efficiency:** Conventional steel (Fe 360) 100%, ferromagnetic crude steel (10-C15) 90%, tool, case-hardened and sectional steels 70 – 80%, magnetic stainless steel 65%, cast iron 50%

**Magnetic field evaluation:** Due to occupational safety and the danger from electromagnetic fields, the EMH was subjected to a magnetic field evaluation. For more information, please contact us.

Ordering example

	EMH	-	RP	-	036	-	B
Description							
EMH							
Magnet type							
RP = Round pole							
MP = Multipole							
DP = dual pole							
Size							
036							
045							
060							
080							
084							
114							
General							
B = Basic							



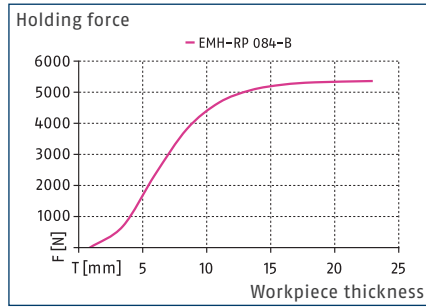


# EMH RP 084

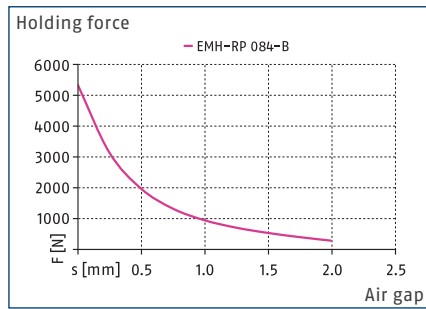
Magnetic gripper



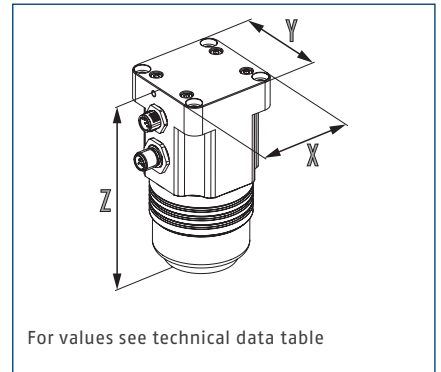
## Workpiece thickness



## Air gap



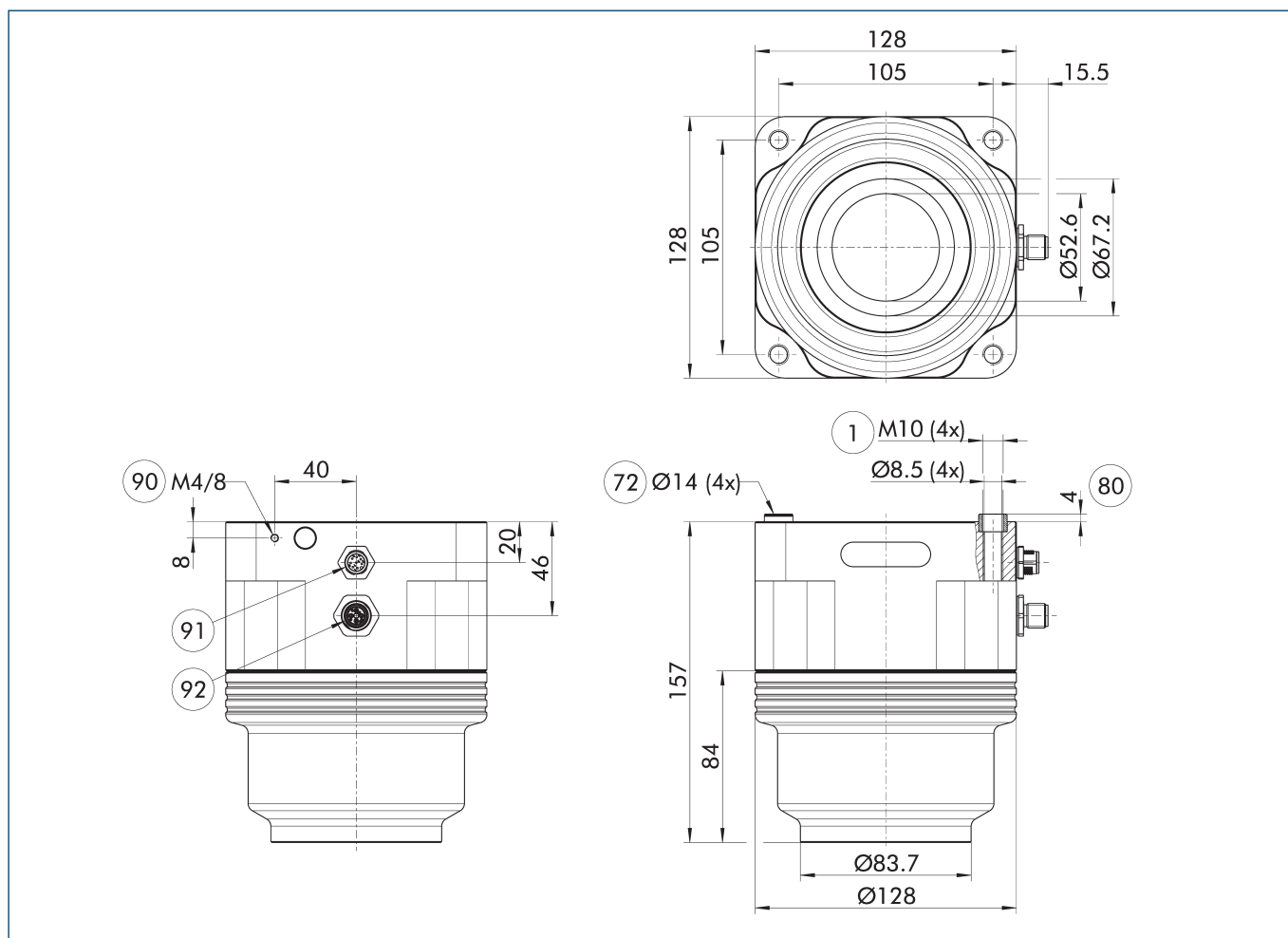
## Dimensions and maximum loads



## Technical data

Description		EMH-RP 084-B
ID		1351496
<b>General operating data</b>		
Holding force	[N]	5370
Magnet area	[cm <sup>2</sup> ]	41.25
Payload for horizontal magnet surface	[kg]	89
Payload for vertical magnet surface	[kg]	35
Module temperature increase in case of 5/15 activations/minute	[°C]	14/37
Activation time	[ms]	500
Min./max. ambient temperature	[°C]	5/50
<b>Mechanical operating data</b>		
Weight	[kg]	6.5
IP protection class		52
<b>Electrical operating data</b>		
Nominal voltage	[V]	24
Type of voltage		DC
Max. current power	[A]	6.1
Rated current logic	[A]	0.15
Controller electronics		integrated
Dimensions X x Y x Z	[mm]	128 x 128 x 157

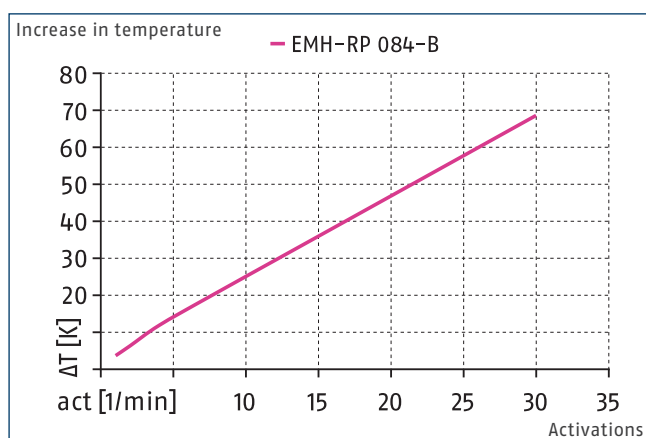
## Main view EMH-RP 084



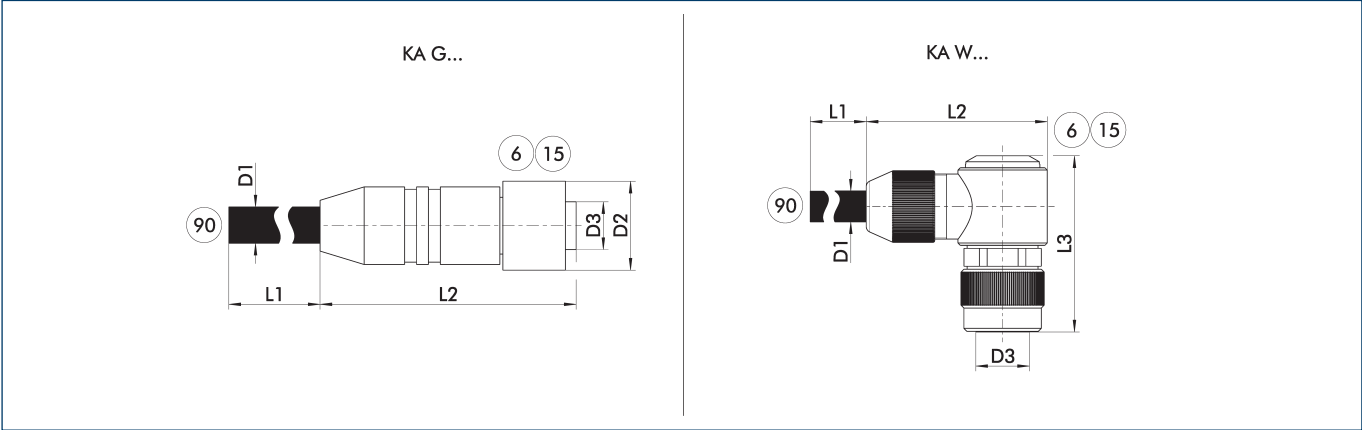
The drawing shows the magnet gripper in basis configuration, without any additional accessories.

- ① Gripper connection
- ⑦② Fit for centering sleeves
- ⑧② Depth of the centering sleeve hole in the counter part
- ⑨② Functional ground
- ⑨① M12-socket, 8-pin (activation)
- ⑨② M12 connector, T-coded (voltage supply)

## Increase in temperature



Voltage supply connection cable



KA G... Connection cable with straight plug connector  
KA W... Connection cable with angled plug connector

6 Connection module side  
15 Socket

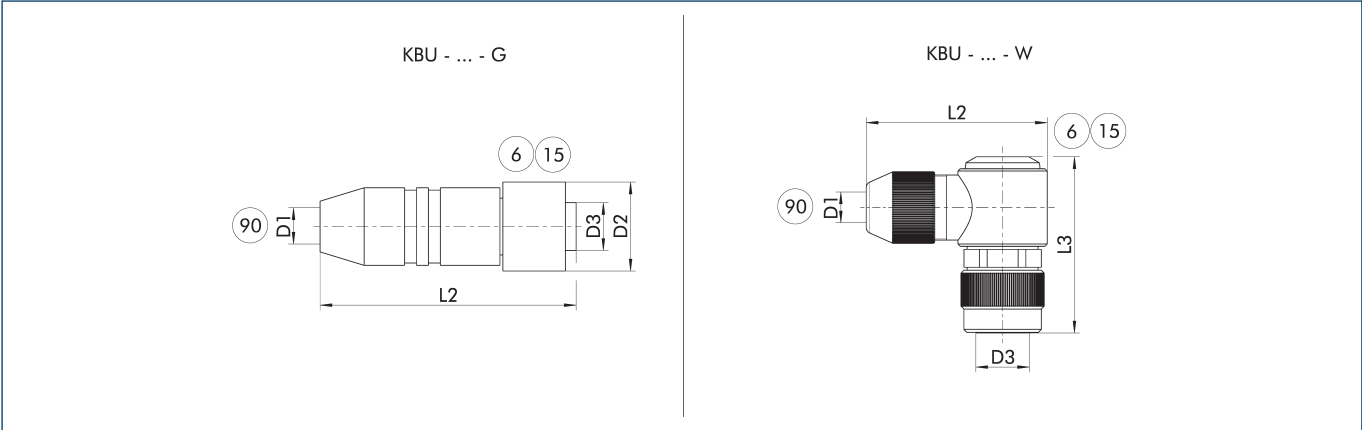
90 Cable end with open wire strands

The connection cables are used to connect the SCHUNK product to the voltage supply.

Description	ID	L1	D1	L2	D2	L3	D3
		[m]	[mm]	[mm]	[mm]	[mm]	
Voltage supply connection cable - cable track compatible							
KA GLN12T0150-LK-00500-A	0310262	5	9.6	51	15		M12 T-coded
KA GLN12T0150-LK-01000-A	0310264	10	9.6	51	15		M12 T-coded
KA WLN12T0150-LK-00500-A	0310263	5	9.6	47.5		35	M12 T-coded
KA WLN12T0150-LK-01000-A	0310265	10	9.6	47.5		35	M12 T-coded

1 Please observe the min. bending radius for cable track-compatible cables or the max. torsion angle for torsion-compatible cables. These are generally 10 times the cable diameter or +/- 180°/m. Please refer to the product documentation for information about max. cable length and min. wire cross section.

Power supply plug-in connector



KBU - ... - G Socket with straight outlet  
KBU - ... - W Socket with angular outlet

6 Connection module side  
15 Socket

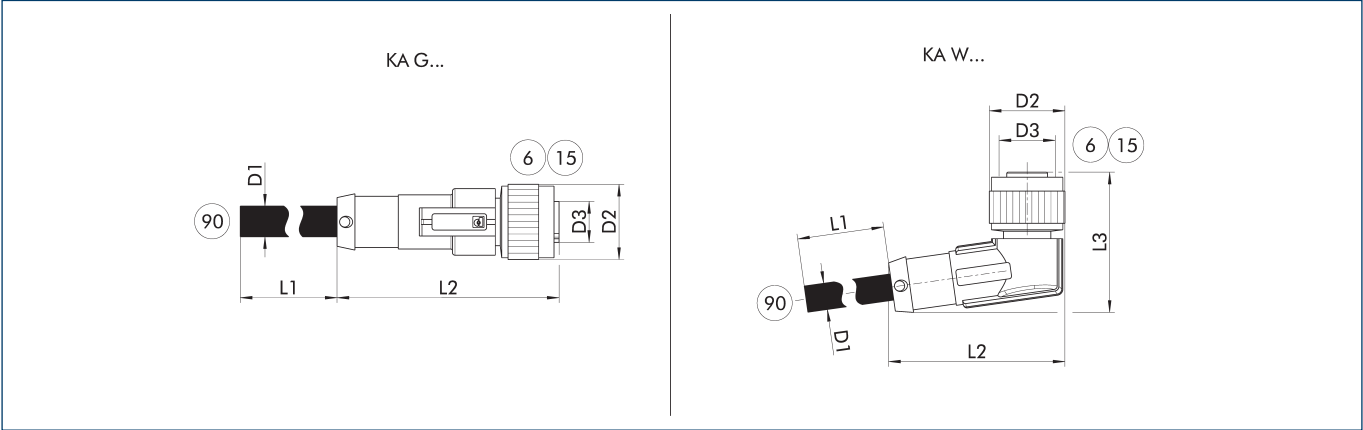
90 D1 - max. diameter connection cable

The plug connectors are used to connect the SCHUNK product to the voltage supply. A customer cable can be used for this. The individual wire strands are clamped using screw connections in the plug connector.

Description	ID	D1 (max.)	L2	D2	L3	D3
		[mm]	[mm]	[mm]	[mm]	
Power supply plug-in connector						
KBU-M12T-G 4P	0310260	10	58	20.2		M12 T-coded
KBU-M12T-W 4P	1001514	10	43	20.2	39	M12 T-coded

1 For the connection cable, a cross-section for each individual wire strand of 1.5 mm<sup>2</sup> is recommended. Please refer to the product documentation for information about max. cable length and min. wire cross section.

Connection cable for control



- KA G... Connection cable with straight plug connector
- KA W... Connection cable with angled plug connector
- 6 Connection module side
- 15 Socket
- 90 Cable end with open wire strands

The connection cables are used to control the SCHUNK product.

Description	ID	L1	D1	L2	D2	L3	D3
		[m]	[mm]	[mm]	[mm]	[mm]	
Connection cable actuation – drag chain and torsion compatible							
KA GLN1208-IO-00200-A	1395458	2	6	44	14.8		M12
KA GLN1208-IO-00500-A	1395471	5	6	44	14.8		M12
KA GLN1208-IO-01000-A	1395479	10	6	44	14.8		M12
KA WLN1208-IO-00200-A	1395482	2	6	34.5	14.8	27.4	M12
KA WLN1208-IO-00500-A	1395483	5	6	34.5	14.8	27.4	M12
KA WLN1208-IO-01000-A	1395485	10	6	34.5	14.8	27.4	M12

ⓘ Please observe the min. bending radius for cable track-compatible cables or the max. torsion angle for torsion-compatible cables. These are generally 10 times the cable diameter or +/- 180°/m. Please refer to the product documentation for information about max. cable length and min. wire cross section.



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