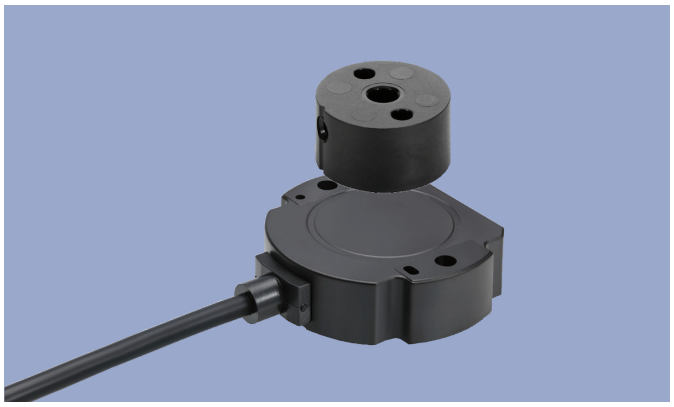
novotechnik
Siedle Group

NOVOHALL
Rotary Sensor
Touchless

RFC-4800
Incremental
Mobile Applications



Special Features
- Touchless hall technology
- Electrical range 360°
- 2 part design, mechanically decoupled
- Wear-free
- High protection class IP67, IP68, IP69
- Resolution up to 12 bits
- Temperature range -40 °C to +85 °C
- For very high rotational speeds
- Other configurations see separate data sheets

Applications
- Mobile working machines (industrial trucks, construction machinery, agricultural and forestry machinery)
- Marine applications

The 2 part design consisting of sensor and magnetic position marker offers great flexibility when mounting. The absence of shaft and bearing makes the assembly much less sensitive to axial and radial application tolerances - separate couplings are obsolete. Measurements can be made transmissively through any non-ferromagnetic material.
The sensor is perfectly suitable for use in harsh environmental conditions through the completely encapsulated electronics.

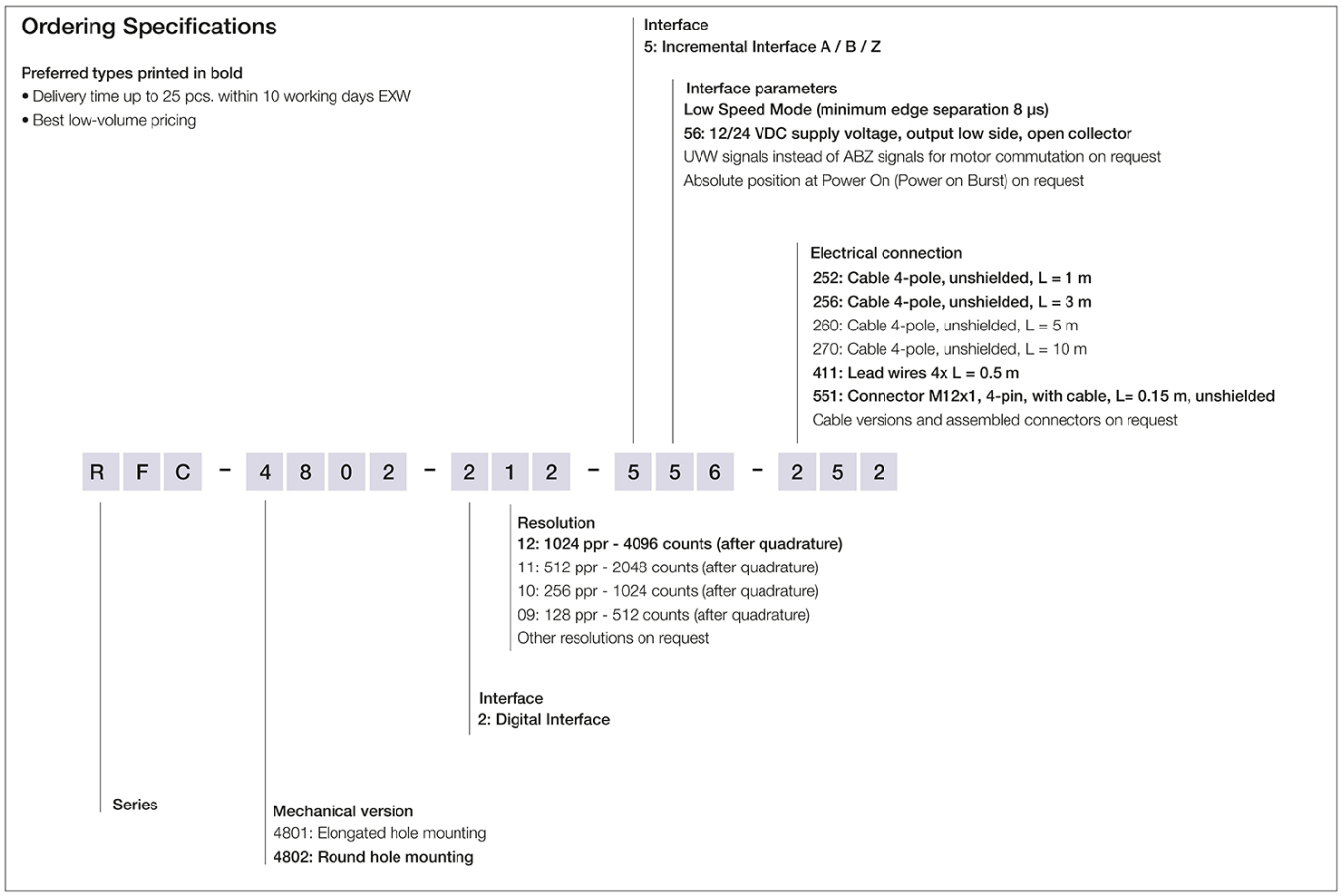
Description

Material	Housing: high grade, temperature resistant plastic
Mounting	With 2 pan head screws M4x20 (included in delivery)
Fastening torque of mounting	250 Ncm
Electrical connection	Lead wires 0.5 mm² (AWG 20), PVC / Connector M12x1, A-coded with cable L = 0.15 m / Cable 4x 0.5 mm² (AWG 20), TPE, unshielded

Mechanical Data

Dimensions	See dimension drawing
Mechanical travel	360° continuous
Weight (w/o connection)	approx. 50 g

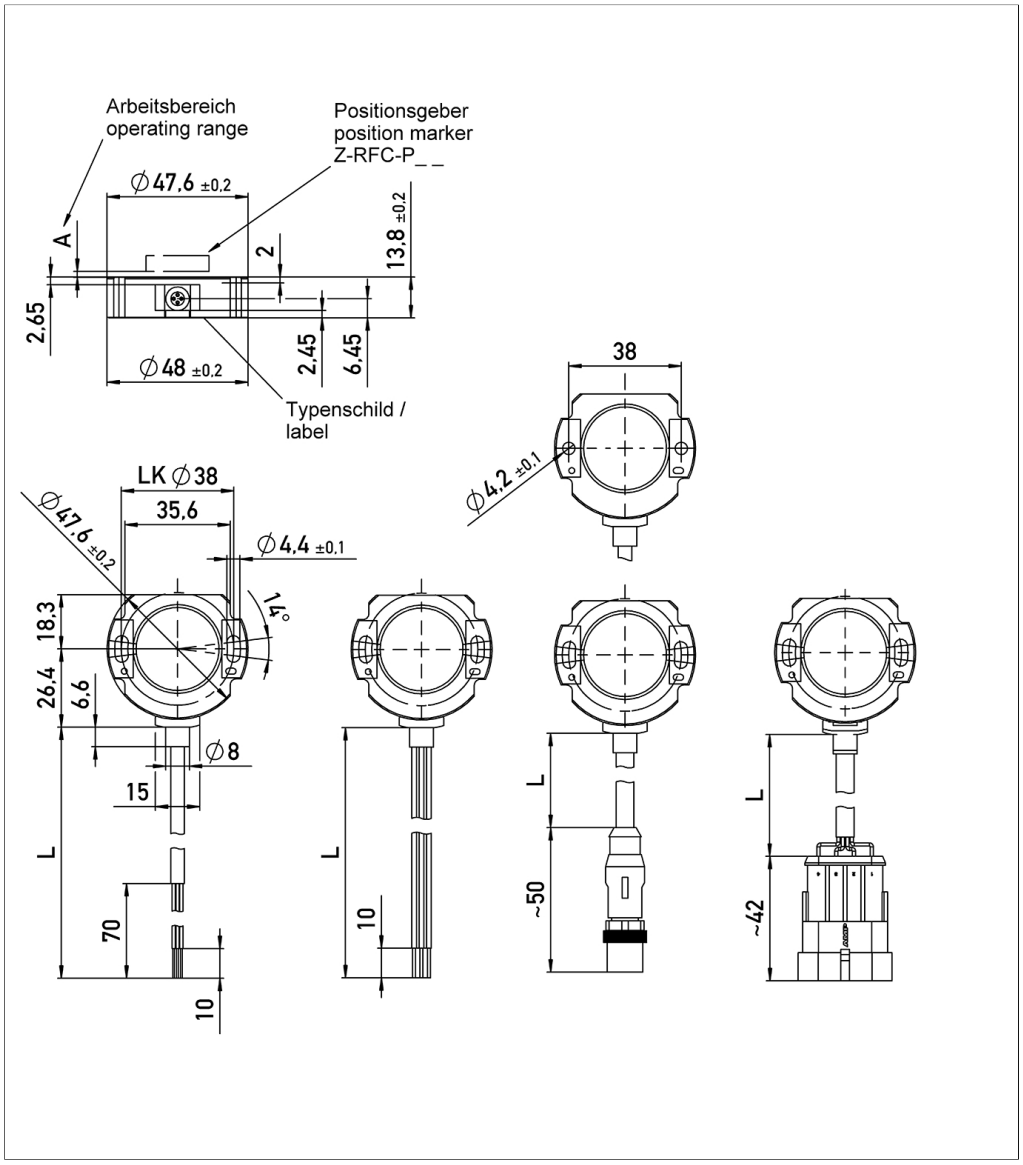
Ordering Specifications

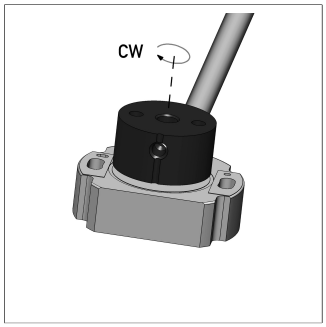


Accessories included in delivery
• 2x Pan head screws M4x20

Drawing

CAD data see
www.novotechnik.de/en/download/cad-data/





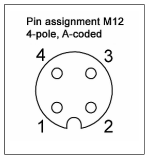
Rotational direction CW: A leads before B.

Technical Data

Type	**RFC-48_ _-212-556-_ _ _** **Incremental Open Collector**	**RFC-48_ _-211-556-_ _ _**	**RFC-48_ _-210-556-_ _ _**	**RFC-48_ _-209-556-_ _ _**
Outputs	A- / B-			
Level	Open Collector			
Pulses per revolution	1024 ppr	512 ppr	256 ppr	128 ppr
Counts per revolution	4096 after quadrature	2048 after quadrature	1024 after quadrature	512 after quadrature
Minimum edge separation	8 µs			
Min. input frequency of counter input	32 kHz Valid for 128 and 256 ppr: The requirement for the minimum input frequency of counter input is reduced at lower speed (see charts).			
Max. operational speed	580 rpm	3,500 rpm	7,200 rpm	14,400 rpm
Measuring range	360°			
Independent linearity	≤ ±0.5 %FS			
Repeatability	≤ ±0.2°			
Hysteresis	≤ ±0.7°, lower hysteresis on request			
Temperature error	±0.375 %FS			
Supply voltage Ub	12/24 VDC (9 ... 34 VDC)			
Current consumption w/o load	typ. 10 mA			
Overvoltage protection	60 VDC (10 min.)			
Polarity protection	yes (supply lines)			
Short circuit protection	yes (all outputs vs. GND and supply voltage)			
Load outputs vs. supply voltage Ub	20 mA per channel			
Insulation resistance (500 VDC)	≥ 10 MΩ			
Environmental Data				
Vibration IEC 60068-2-6	20 g, 5 ... 2000 Hz, Amax = 0.75 mm			
Shock IEC 60068-2-27	50 g, 6 ms			
Protection class DIN EN 60529	IP67 / IP68 / IP69, IP67 (connector M12)			
Operating temperature	-40 ... +85°C, -25 ... +85°C (connector M12)			
Life	Mechanically unlimited			
Functional safety	If you need assistance in using our products in safety-related systems, please contact us			
MTTF (IEC 60050)	1154 years			
Traceability	Serial number on type labeling: production batch of the sensor assembly and relevant sensor components			
EMC Compatibility				
ISO 10605 ESD (Handling/Component)	8 kV / 15 kV			
ISO 11452-2 Radiated HF-fields	200 V/m			
ISO 11452-5 Radiated HF-Fields, stripline	200 V/m			
CISPR 25 Radiated emission	Level 5			
ISO 7637-2 Pulses on supply lines	(1) Level 3, (2a, 2b, 3a, 3b, 4, 5) Level 4			

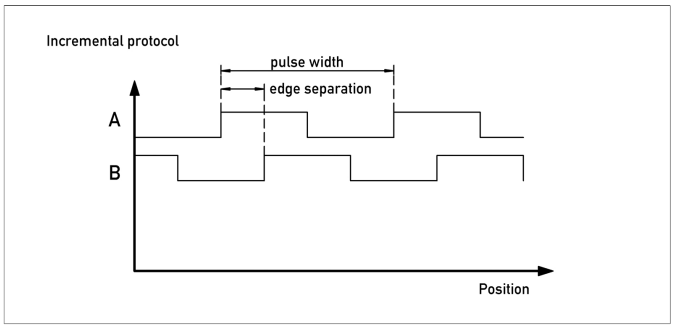
Connection Assignment

Signal	Lead wires code 4_ _	Connector code 5_ _	Cable code 2_ _
A-	BU	Pin 1	GN
Supply voltage Ub	RD	Pin 2	WH
GND	BK	Pin 3	BN
B-	BU/WH	Pin 4	YE

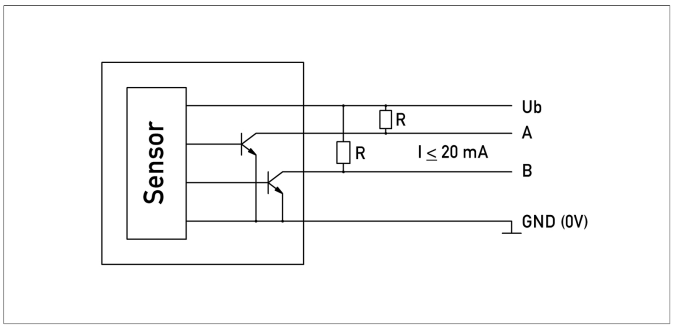


Technical Data

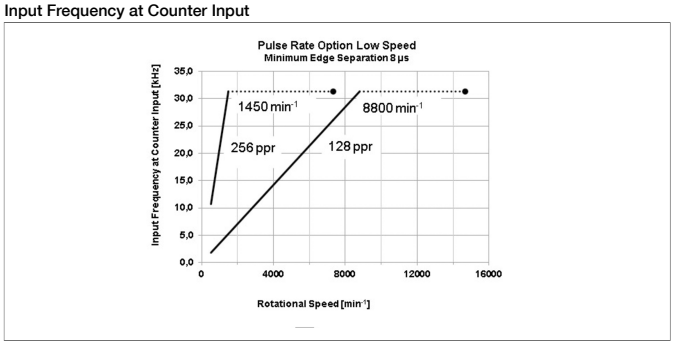
Protocol



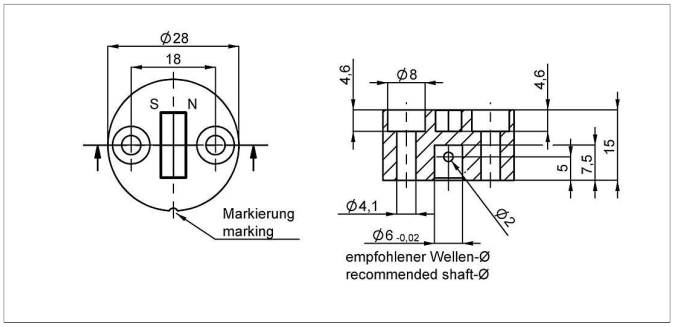
Connection



Input Frequency at Counter Input



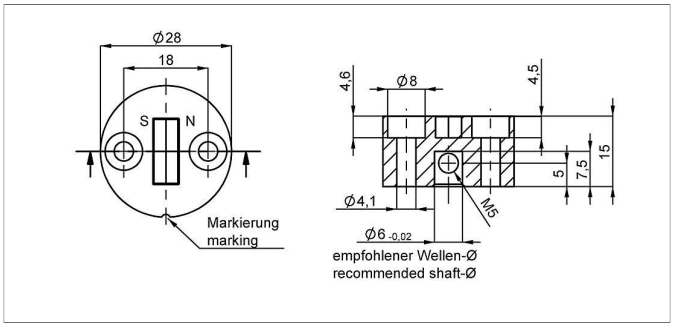
Position Markers



Z-RFC-P02
Position marker for frontal fixation with 2 cylinder head screws M4x20 (with microencapsulation) or with locking pin (both included in delivery).

Material	PF
Max. permitted radial offset	± 3 mm

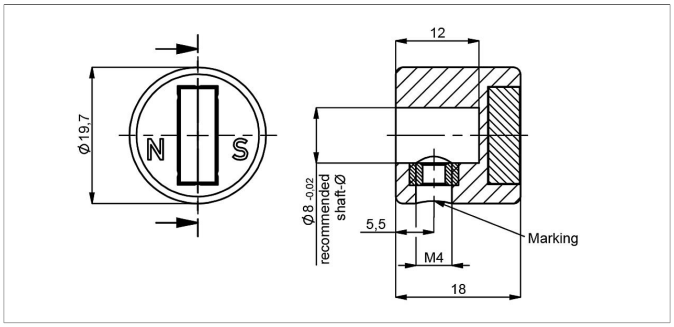
P/N	Pack. unit [pcs]
400005661	1
400056080	25



Z-RFC-P08
Position marker for fixation with threaded pin M5 (included in delivery).

Material	PF
Max. permitted radial offset	± 3 mm

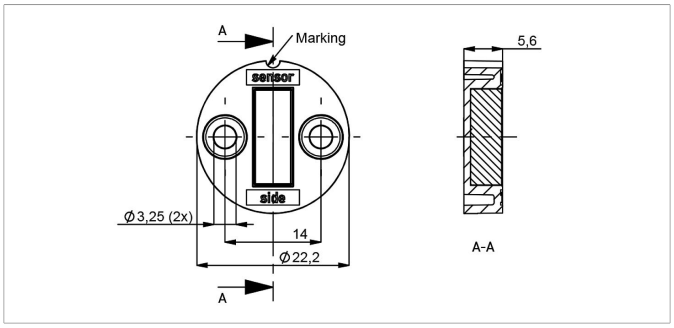
P/N	Pack. unit [pcs]
400056070	1
400056084	25



Z-RFC-P23
Position marker for fixation with threaded pin M4 (included in delivery)
Caution: For orientation of the output characteristic please follow the user manual of the position marker!

Material	PA6-GF
Max. permitted radial offset	± 3 mm

P/N	Pack. unit [pcs]
400056074	1
400056085	25

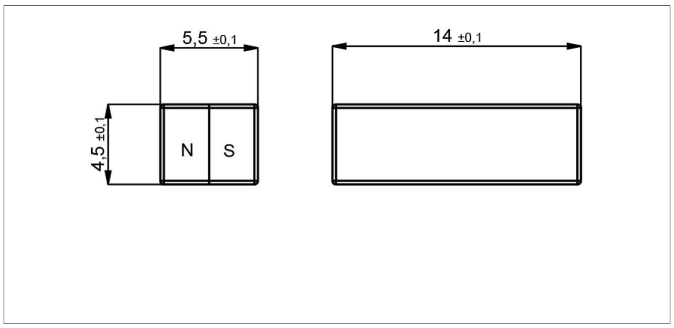


Z-RFC-P31
Position marker for frontal fixation with 2 cylinder screws M3x8 (included in delivery).

Material	PBT-GF
Max. permitted radial offset	± 3 mm

P/N	Pack. unit [pcs]
400056088	1
400056089	25

Position Markers

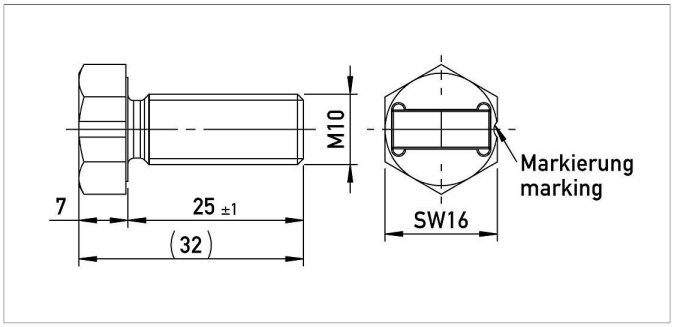


Z-RFC-P04

Magnet for direct application onto customer's shaft (see user manual).
We recommend mounting on non-magnetizable materials, otherwise the specified working distances will vary (e.g. reduction of approx. 20% with axial mounting on a magnetizable shaft).

Max. permitted radial offset	± 3 mm

P/N	Pack. unit [pcs]
400005659	1
400056082	50

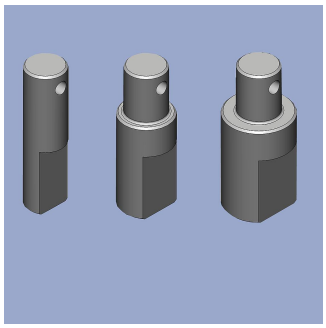


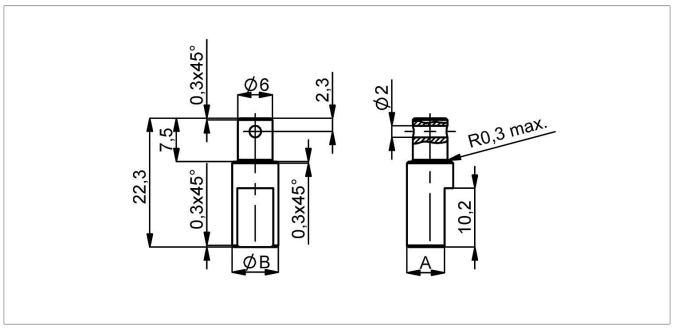
Z-RFC-P20

Screw position marker M10 x 25 mm, similar DIN 933

Material	Aluminium, anodized
Max. permitted radial offset	± 3 mm

P/N	Pack. unit [pcs]
400104758	1
400104759	25





Z-RFC-S01/S02/S03

Shaft adapter for fixation at position marker Z-RFC-P02/P41 with locking pin

Material	Stainless steel 1.4305

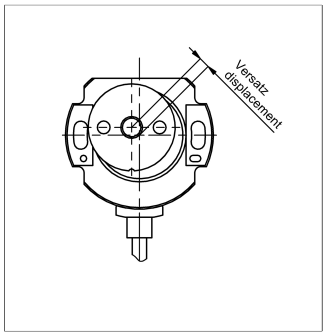
P/N	Type	ØB / A [mm]
400056206	Z-RFC-S01	6 / 4.5
400056207	Z-RFC-S02	8 / 6.5
400056208	Z-RFC-S03	10 / 8.5

Position Markers

Working Distances Position Markers [mm] - One-channel Versions

Z-RFC-P02 / P04 / P08 **Z-RFC-P20 / P23 / P31**
0 ... 1.4

Lateral Magnet Offset

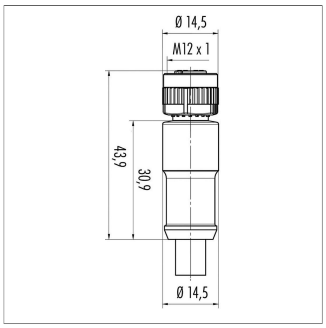


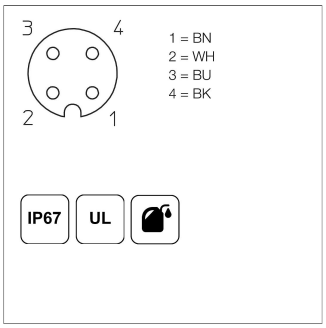
Lateral magnet offset will cause additional linearity error. The angle error, which is caused by radial displacement of sensor and position marker depends on the used position marker or magnet.

Additional Linearity Error at Radial Displacement - One-channel Versions

Z-RFC-P02 / P04 / P08 **Z-RFC-P20 / P23 / P31**
0.5 mm: ±0.4°
1.0 mm: ±0.7°
2.0 mm: ±2.2°

Connector System M12





EEM-33-35/36/37

M12x1 Mating female connector, 4-pin, straight, A-coded, with molded cable, not shielded, IP67, open ended

Plug housing	PA
Cable sheath	PUR, Ø = max. 6 mm, -40 ... +85°C (fixed)
Lead wires	PP, 0.34 mm²

P/N	Type	Length
400056135	EEM-33-35	2 m
400056136	EEM-33-36	5 m
400056137	EEM-33-37	10 m

IP67 Protection class IP67 DIN EN 60529

IP68 Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibiliy (EMC) and shield systems

Very good resistance to oils, coolants and lubricants

Suited for applications in dragchains

UL UL - approved

CAN CAN-Bus

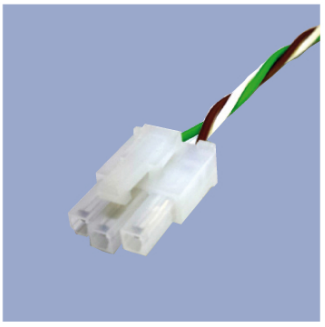
Connecting Options on request

M12 connector
- Customized lengths
- 3-, 4-, 6- and 8-pole versions
- Protection class IP68
- Ordering codes of standard versions see ordering specifications

Tyco AMP Super Seal
- Pin- and bushing housing
- Customized lengths
- 3-, 4- and 6-pole versions
- Protection class IP67
- On request

Deutsch DTM 04
- Pin- and bushing housing
- Customized lengths
- 3-, 4- and 6-pole versions
- Protection class IP67
- On request

ITT Cannon Sure Seal connector
- Customized lengths
- 3-, 4- and 6-pole versions
- Protection class IP67
- On request



Molex Mini Fit jr.
- Customized length and lead wires
- 3-, 4- and 6-pole versions
- On request

Molex Mini Fit jr.
- Customized length and lead wires
- 3-, 4- and 6-pole versions
- On request

novotechnik
Siedle Group

Novotechnik
Messwertaufnehmer OHG
P.O.Box 4220
73745 Ostfildern (Germany)
Horbstrasse 12
73760 Ostfildern (Germany)
Phone +49 711 4489-0
Fax +49 711 4489-118
info@novotechnik.de
www.novotechnik.de