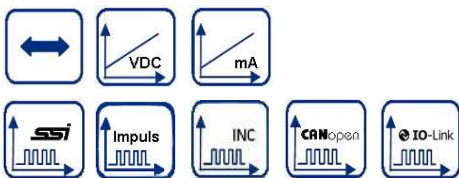
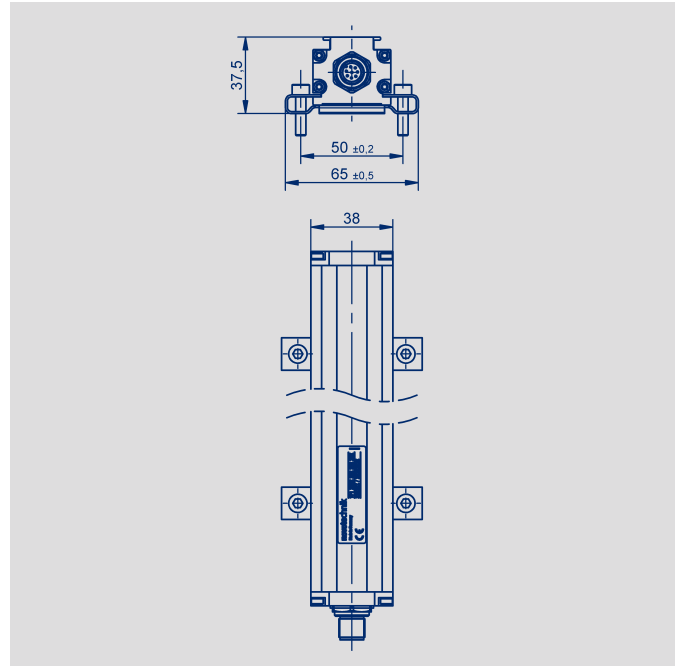
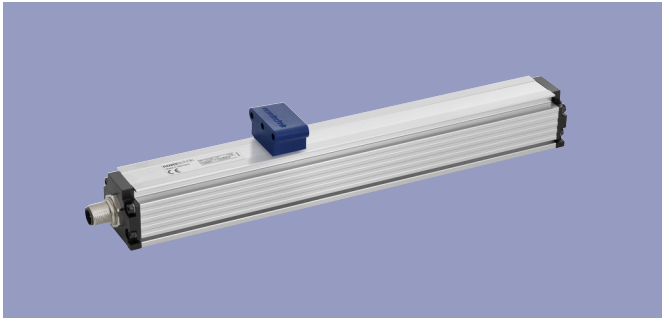


NOVOSTRICTIVE
Transducer
up to 4250 mm
touchless

Series TP1



Special features

- Non-contacting magnetostrictive measurement technology
- Touchless position detection
- Wear-free, unlimited mechanical life
- Resolution up to 1 μm , independently of length
- Low temperature coefficient <math><15 \text{ ppm/K}</math>
- Insensitive to shock and vibration
- Protection class IP67 / IP68
- Position-Teach-In
- Optionally galvanic isolated
- Interfaces: Analog, SSI, Impulse, Incremental, CANopen, IO-Link

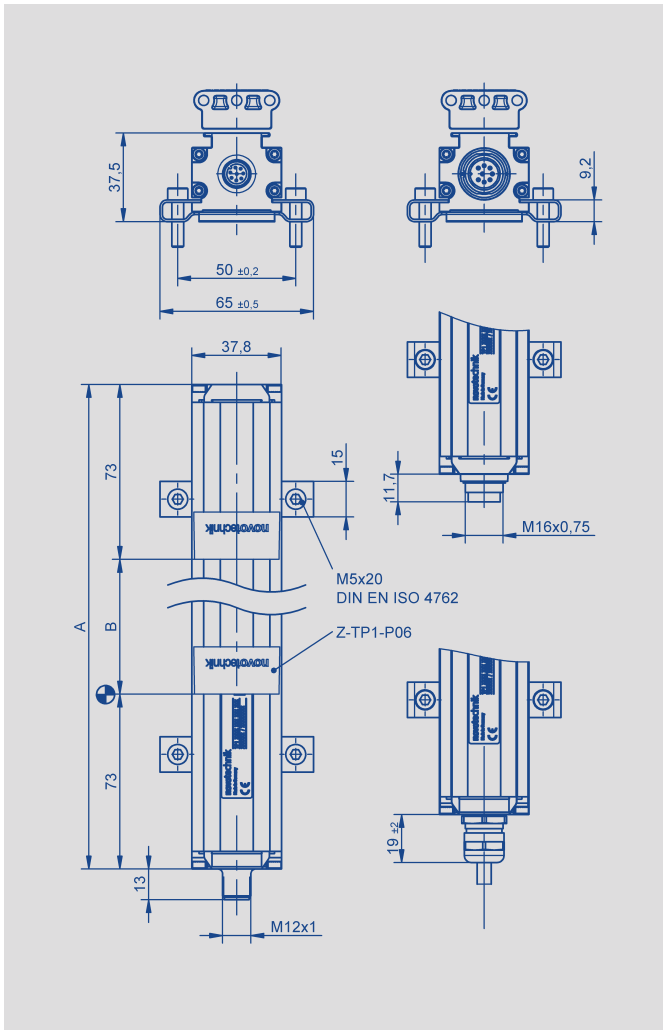
Applications

- Manufacturing Engineering
 - Plastic injection molding
 - Textile
 - Packaging
 - Sheet metal working
 - Woodwork
- Automation Technology

Transducer in profile design with magnetostrictive technology for highly accurate and reproducible position measurement for lengths up to 4250 mm. Mechanically decoupled and therefore wear-free when the floating position marker is used.

The transducer TP1 is insensitive to dirt, dust or moisture and thus proves itself in harsh industrial environments. Depending on the interface, up to three positions and speed can be measured.

Mechanical Data



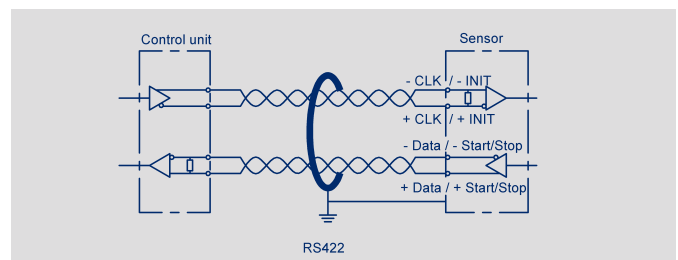
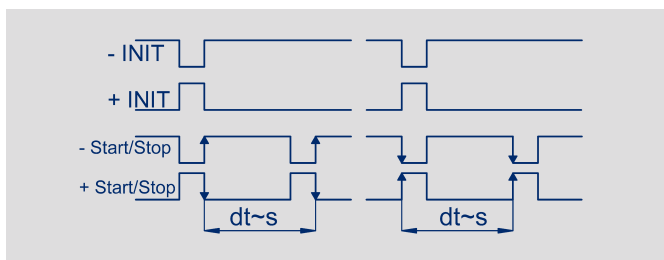
Description	
Materials	Housing: Anodized aluminum, AlMgSi0,5 F22, 3.3206.71 End flanges: Aluminum G AlSi12Cu1 (FE)
Mounting	Adjustable clamps (included in delivery)
Position marker	Floating position marker, plastic Guided position marker, plastic, with ball coupling
Electrical connections	Connector M12x1, 4-pin / 5-pin / 8-pin, shielded Connector M16x0.75 (IEC 130-9), 6-pin / 8-pin, shielded PUR-cable, 8 x 0.25 mm ² , shielded: 1 m, 3 m oder 5 m length
Electronic	SMD with ASIC, integrated Connector casing (shield) is connected to the sensor housing. Housing is capacitively decoupled to the electronics

Mechanical Data	
Dimensions	see dimension drawing
Length of housing (dimension A)	Dimension B + 146 mm
Electrical measuring range (dimension B)	0050 up to 0500 mm in 25 mm steps, 500 up to 1000 mm in 50 mm steps, 1000 up to 2000 mm in 100 mm steps, 2000 up to 4250 mm in 250 mm steps other lengths on request
Max. operational speed with valid output signal	10 ms ⁻¹
Max. operational acceleration with valid output signal	200 ms ⁻²
Shock (IEC 60068-2-27)	100 (11 ms) (single hit) g
Vibration (IEC 60068-2-6)	20 (5...2000 Hz, Amax = 0.75 mm) g
Protection class (DIN EN 60529)	IP67 with fastened connector IP68 with cable connection
Life	Mechanically unlimited (with floating position marker)
Operating temperature range	-40 ... +85 °C
Storage temperature range	-40 ... +105 °C
Operating humidity range	0 ... 95 (no condensation) % R.H.

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

Technical Data Impulse-Interface

Type designations	TP1- _ _ _ _ - 101 - 11 _ - _ _ _ Start-Stop-Impulse-Interface	
Electrical Data		
Electrical measuring range (dimension B)	0050 up to 4250	mm
Number of position markers	1 up to 3	
Protocol	Impulse	
Inputs	RS422	
Sampling rate / Update rate	< 500 mm: 1 kHz, 500 ... < 2000 mm: 0.5 kHz, > 2000 mm: 0.25 kHz	kHz
Resolution	Depending on interpretation, normalized to 2800 ms ⁻¹	
Absolute linearity	< 1000 mm ≤ ±50 μm < 2500 mm ≤ ±80 μm up to 4250 mm ≤ ±120 μm	μm
Tolerance of electr. zero point	± 0.5	mm
Reproducibility	≤ 6	μm
Hysteresis	≤ 4	μm
Temperature error	≤ 15 (min. 0,01 mm/K)	ppm/K
Supply voltage	24 (13 ... 34)	VDC
Supply voltage ripple	≤ 10	% Ub
Overvoltage protection	40 (permanent)	VDC
Current consumption	≤ 100	mA
Polarity protection	Yes, up to supply voltage max.	
Short circuit protection	Yes (outputs vs. GND and supply voltage up to 7 V)	
Insulation resistance (500 VDC)	≥ 10	MΩ
Environmental Data		
MTTF (DIN EN ISO 13849-1, parts count method, w/o load, wc)	27	Years
Functional safety	If you need assistance in using our products in safety-related systems, please contact us	
EMC compatibility	EN 61000-4-2 Electrostatic discharges (ESD) 4 kV, 8 kV EN 61000-4-3 Electromagnetic fields 10 V/m EN 61000-4-4 Electrical fast transients (burst) 2 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 55011 Radiated disturbances class B	



Pin assignment

Connector code 101, 102	Cable code 20 _	Connector with cable (Accessories)	Start/Stop-Impulse-Interface
Pin 1	YE	WH	INIT +
Pin 2	GY	BN	Start/Stop +
Pin 3	PK	GN	INIT -
Pin 4	RD	YE	do not connect
Pin 5	GN	GY	Start/Stop -
Pin 6	BU	PK	GND
Pin 7	BN	BU	Supply voltage
Pin 8	WH	RD	do not connect

Connector code 103	Connector with cable (Accessories)	Start/Stop-Impulse-Interface
Pin 1	WH	Start/Stop -
Pin 2	BN	Start/Stop +
Pin 3	BU	INIT +
Pin 4	BK	INIT -
Pin 5	GY	Supply voltage
Pin 6	GN	GND

Ordering Specifications
Digital Versions
- SSI
- Start-Stop-Impulse
- Incremental

Ordering specifications

Preferred types printed in bold

Mechanical version

101: Profile design

Electrical Interface

- 1: Impulse-Interface**
- 2: SSI-Interface**
- 8: Incremental-Interface (A / B / Z)**

Output signal Impulse-Interface 1 __
1: Impulse-Interface Start-Stop Signal

Output signal SSI-Interface 2 __
1: SSI 24 bit
2: SSI 25 bit
7: SSI 26 bit (25 = alarm, 26 = parity even) on request

Output signal Incremental-Interface 8 __
4: Resolution 5 µm, high speed mode, power-on burst
6: Resolution 1 µm, high speed mode, power-on burst
7: Resolution 5 µm, low speed mode, power-on burst
9: Resolution 1 µm, low speed mode, power-on burst

Impulse-Interface Start-Stop Signal 11_
1: For 1 position marker
2: For 2 position markers
3: For 3 position markers

Synchronous-Serial Interface 2 __
1: Binary code; resolution 5 µm
2: Gray code; resolution 5 µm
4: Binary code; resolution 1 µm
5: Gray code; resolution 1 µm
7: Binary code; resolution 10 µm
8: Gray code; resolution 10 µm

Incremental-Interface 8 __
1: RS422 differential (A / B / Z)

Electrical connection

- 101: Connector M16x0.75 (IEC 130-9), 8-pin *
- 102: Connector M12x1, 8-pin**
- 103: Connector M16x0.75 (IEC 130-9), 6-pin *
- 201: Cable, 8-pole, shielded, 1 m**
- 203: Cable, 8-pole, shielded, 3 m
- 205: Cable, 8-pole, shielded, 5 m
- *) not for incremental interface

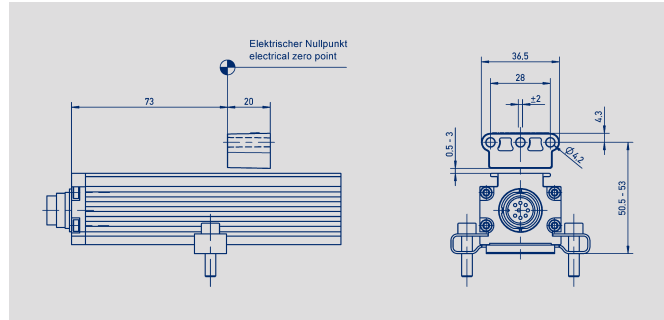
T P 1 - 0 8 0 0 - 1 0 1 - 2 1 1 - 1 0 2

Series

Electrical measuring range
Standard lengths 0050 up to 4250 mm
0050 up to 0500 mm in 25 mm-steps, 0500 up to 1000 mm in 50 mm-steps,
1000 up to 2000 mm in 100 mm-steps, 2000 up to 4250 mm in 250 mm-steps.
Other lengths on request

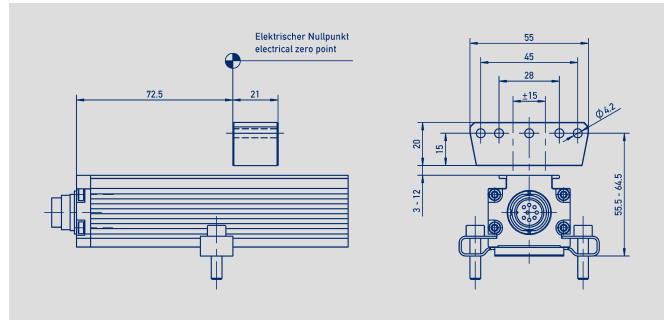
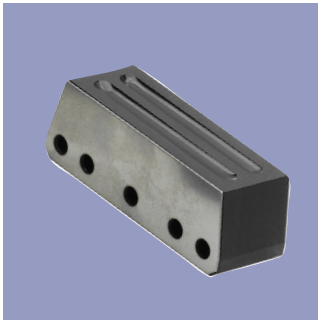
Important: Avoid equalizing currents in the cable shield caused by potential differences.
Twisted pair cable (STP) is recommended.

Position Marker



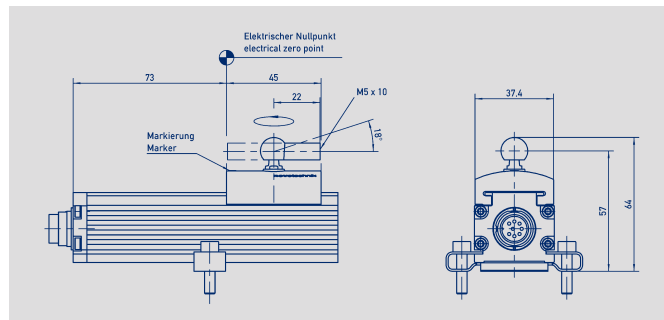
Floating position marker

Material	PA6 GF25
Working distance	0.5 ... 3 mm
Weight	approx. 10 g
P/N 005693, Z-TP1-P06	



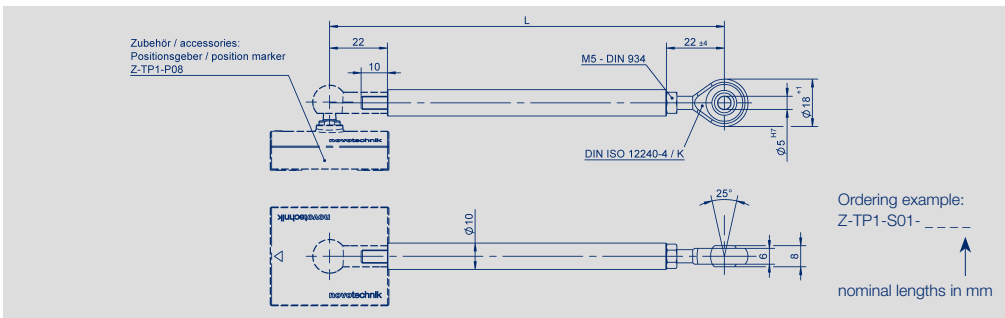
Floating position marker for large distances

Material	PA6 GB30
Working distance	3 ... 12 mm
Weight	approx. 40 g
P/N 005694, Z-TP1-P07	



Guided position marker

Material	POM
Weight	approx. 30 g
P/N 005695, Z-TP1-P08	

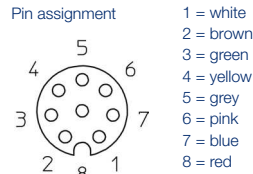
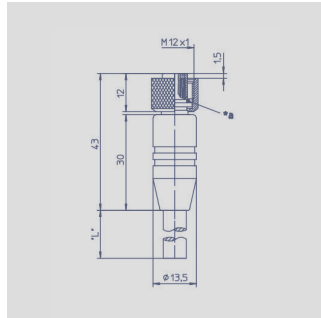


Actuating rod for guided position marker Z-TP1-P08

Material	Aluminum
Weight	approx. 150 g
Standard-nominal lengths (mm)	0075, 0100, 0125, 0150, 0200, 0250, 0300, 0350, 0400, 0450, 0500, 0600, 0800, 1000, 1500, 2000

Z-TP1-S01-...
Environmental conditions, length of actuating rod, acceleration etc. have a direct influence on life time and accuracy of the whole system; it must be qualified by the user in the real application.

Connector System M12

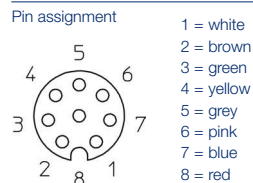
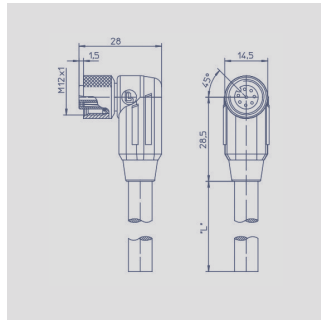


M12x1 Mating female connector, 8-pin, straight, A-coded, with molded cable, shielded, IP67, open ended

Connector housing	Plastic PA	
Cable sheath	PUR; Ø = max. 8 mm -25 °C...+80 °C (moved) -50 °C...+80 °C (fixed)	

Wires	PP, 0.25 mm ²	
-------	--------------------------	--

Length	Type	P/N
2 m	EEM 33-86	005629
5 m	EEM 33-90	005635
10 m	EEM 33-92	005637

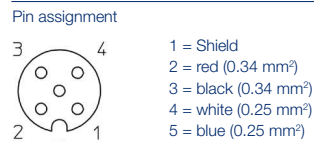
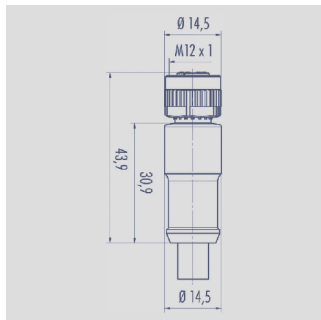


M12x1 Mating female connector, 8-pin, angled, A-coded, with molded cable, shielded, IP67, open ended

Connector housing	Plastic PA	
Cable sheath	PUR; Ø = max. 8 mm, -25 °C...+80 °C (moved) -50 °C...+80 °C (fixed)	

Wires	PP, 0.25 mm ²	
-------	--------------------------	--

Length	Type	P/N
2 m	EEM 33-87	005630
5 m	EEM 33-91	005636
10 m	EEM 33-93	005638

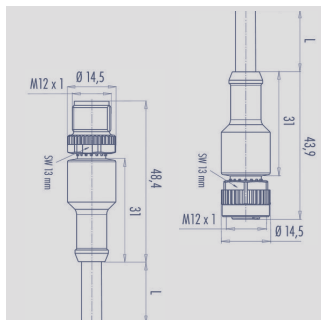


M12x1 Mating female connector, 5-pin, straight, A-coded, with molded cable, IP67, shielded, open ended, CAN-bus

Connector housing	PUR	
Cable sheath	PUR Ø = max. 7.2 mm, -25 °C...+85 °C (moved)	

Wires	PP 2x 0.25 mm ² + 2 x 0.34 mm ²	
-------	--	--

Length	Type	P/N
2 m	EEM 33-41	056141
5 m	EEM 33-42	056142
10 m	EEM 33-43	056143

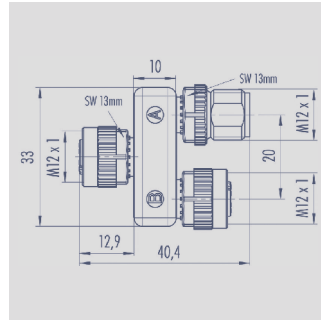


M12x1 Mating female connector, 5-pin, straight, A-coded, with molded cable, IP68, shielded, CAN-bus

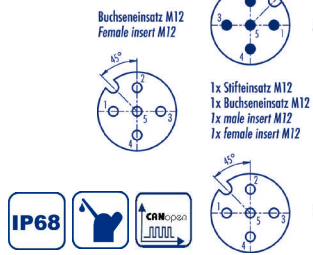
Connector housing	PUR	
Cable sheath	PUR; Ø 7.2 mm -25 °C... +85 °C (fixed)	

Length	Type	P/N
5 m	EEM 33-44	056144

Connector System M12

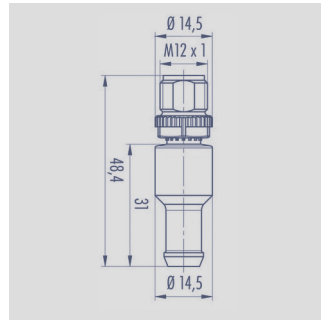


Pin assignment

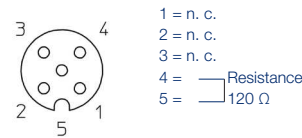


T-connector M12x1, 5-pin, A-coded, IP68, 1:1 connection, female - male - female, CAN-bus

Connector housing PUR
Temperature range -25 °C... +85 °C
Type EEM 33-45, P/N 056145

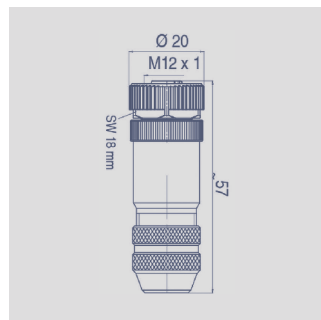


Pin assignment

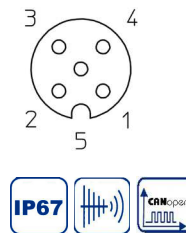


Terminating resistor M12x1, 5-pin, A-coded, IP67, 120 Ω resistance, CAN-bus

Connector housing PUR
Temperature range -25 °C... +85 °C
Type EEM 33-47, P/N 056147

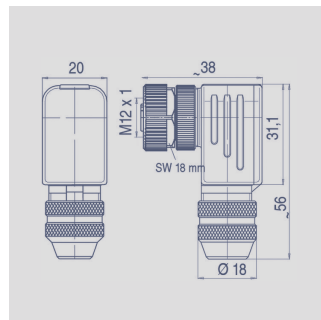


Pin assignment

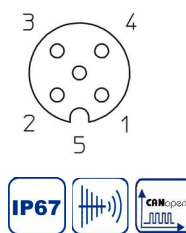


M12x1 Mating female connector, 5-pin, straight, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN-bus

Connector housing Metal
-40 °C...+85 °C
For wire gauge 6...8 mm, max. 0.75 mm²
Type EEM 33-73, P/N 005645



Pin assignment

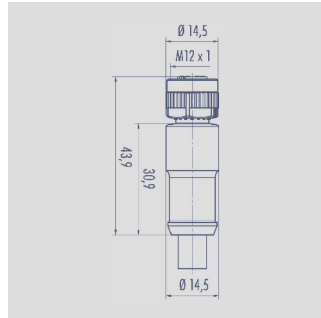


M12x1 Mating female connector, 5-pin, angled, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN-bus

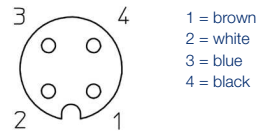
Connector housing Metal
-40 °C...+85 °C
For wire gauge 6...8 mm, max. 0.75 mm²
Type EEM 33-75, P/N 005646

It is possible to turn and fix the contact carrier in 90° positions.

Connector System M12



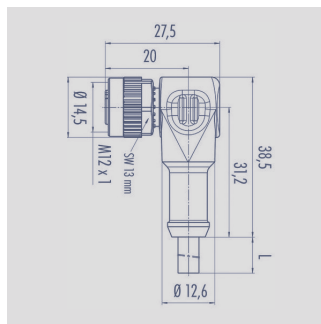
Pin assignment



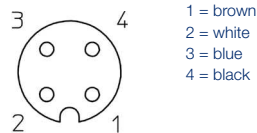
M12x1 Mating female connector, 4-pin, straight, A-coded, with molded cable, not shielded, IP67, open ended

Connector housing	Plastic PA	
Cable sheath	PUR; Ø = max. 6 mm, -40 °C...+85 °C (fixed)	
Wires	PP, 0.34 mm ²	

Length	Type	P/N
2 m	EEM 33-35	056135
5 m	EEM 33-36	056136
10 m	EEM 33-37	056137



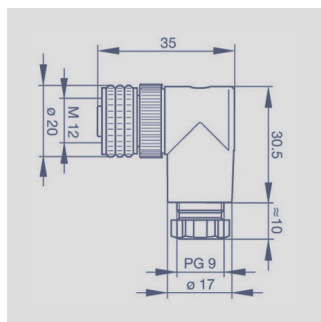
Pin assignment



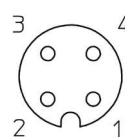
M12x1 Mating female connector, 4-pin, angled, A-coded, with molded cable, not shielded, IP67, open ended

Connector housing	Plastic PA	
Cable sheath	PUR; Ø = max. 6 mm, -40 °C...+85 °C (fixed)	
Wires	PP, 0.34 mm ²	

Length	Type	P/N
2 m	EEM 33-38	056138
5 m	EEM 33-39	056139
10 m	EEM 33-40	056140



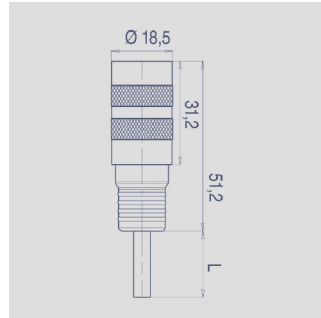
Pin assignment



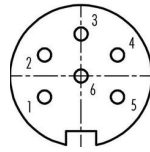
M12x1 Mating female connector, 4-pin, angled, A-coded, with coupling nut, screw termination, IP67, not shielded

Connector housing	Plastic PBT -25 °C...+90 °C	
For wire gauge	6...8 mm, max. 0.75 mm ²	
Type	EEM 33-89, P/N 005634	

Connector System M16



Pin assignment



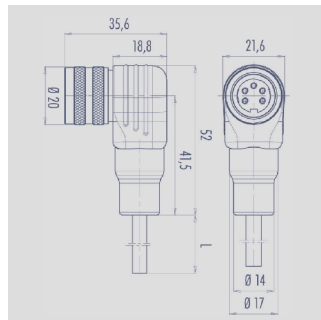
- 1 = red
- 2 = black
- 3 = yellow
- 4 = blue
- 5 = white
- 6 = green



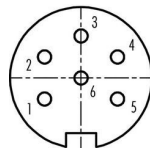
M16x0.75 Mating female connector, 6-pin, straight, with molded cable, 2 m length, shielded, IP67, open ended

Connector housing	PUR
Cable sheath	PUR; Ø max. 6 mm, -5...+70 °C (moved) -20...+70 °C (fixed)
Wires	PVC, 6 x 0.25 mm ²
Type	EEM 33-26, P/N 056126

This coupling can be used in combination with 5-pin M16 connectors. Than „pin 6 / green“ is open.



Pin assignment



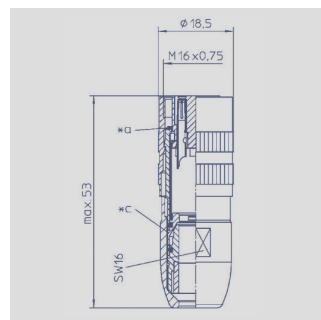
- 1 = red
- 2 = black
- 3 = yellow
- 4 = blue
- 5 = white
- 6 = green



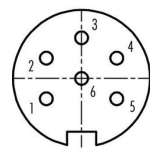
M16x0.75 Mating female connector, 6-pin, angled, with molded cable, 2 m length, shielded, IP67, open ended

Connector housing	PUR
Cable sheath	PUR; Ø max. 6 mm, -5...+70 °C (moved) -20...+70 °C (fixed)
Wires	PVC, 6 x 0.25 mm ²
Type	EEM 33-27, P/N 056127

This coupling can be used in combination with 5-pin M16 connectors. Than „pin 6 / green“ is open.

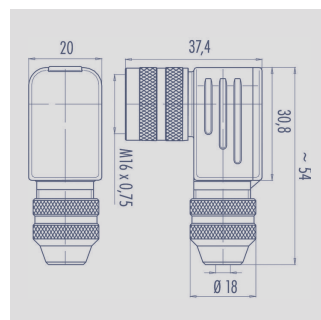


Pin assignment

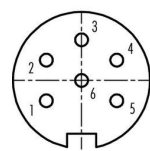


M16x0,75 Mating female connector, 6-pin, straight, with coupling nut, solder terminal, IP68, shielded

Connector housing	CuZn (Brass, nickel plated) -40 °C... +85 °C
For wire gauge	4...8 mm, max. 0.75 mm ²
Type	EEM 33-82, P/N 005639



Pin assignment



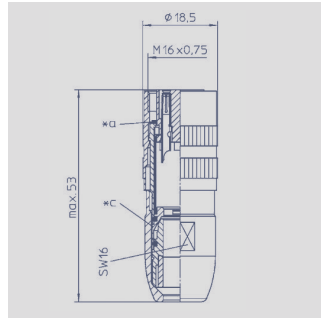
M16x0,75 Mating female connector, 6-pin, angled, with coupling nut, solder terminal, IP67, shielded

Connector housing	CuZn (Brass, nickel plated) -40 °C... +95 °C
For wire gauge	6...8 mm, PG 9 max. 0.75 mm ²
Type	EEM 33-94, P/N 005648

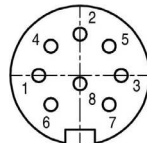
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info@novotechnik.de
www.novotechnik.de



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Pin assignment

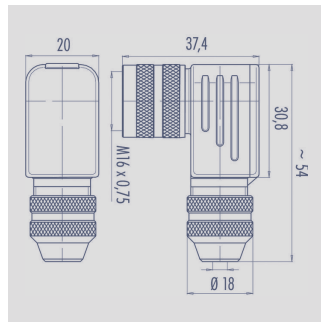


M16x0.75 Mating female connector, 8-pin, straight, with coupling nut, solder terminal, IP68, shielded

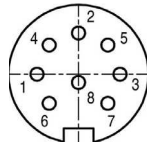
Connector housing	CuZn (Brass, nickel plated) -40 °C... +85 °C
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For wire gauge	4...8 mm, max. 0.75 mm ²
----------------	--

Type EEM 33-84, P/N 005627



Pin assignment



M16x0.75 Mating female connector, 8-pin, angled, with coupling nut, solder terminal, IP67, shielded

Connector housing	CuZn (Brass, nickel plated) -40 °C... +95 °C
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For wire gauge	6...8 mm, PG 9 max. 0.75 mm ²
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Type EEM 33-85, P/N 005628

IP67 Protection class IP67 to DIN EN 60529

IP68 Protection class IP68 to DIN EN 60529

CANopen CAN-bus

Very good Electromagnetic Compatibility (EMC) and shield systems

Very good resistance to oils, coolants und lubricants

UL UL - approved

Suited for applications in dragchains

Note: The protection class is valid only in locked position with its plugs.

The application of these products in harsh environments must be checked in particular cases.

The specifications contained in our datasheets are intended solely for informational purposes. The documented specification values are based on ideal operational and environmental conditions and can vary significantly depending on the actual customer application. Using our products at or close to one or more of the specified performance ranges can lead to limitations regarding other performance parameters. It is therefore necessary that the end user verifies relevant performance parameters in the intended application. We reserve the right to change product specifications without notice.