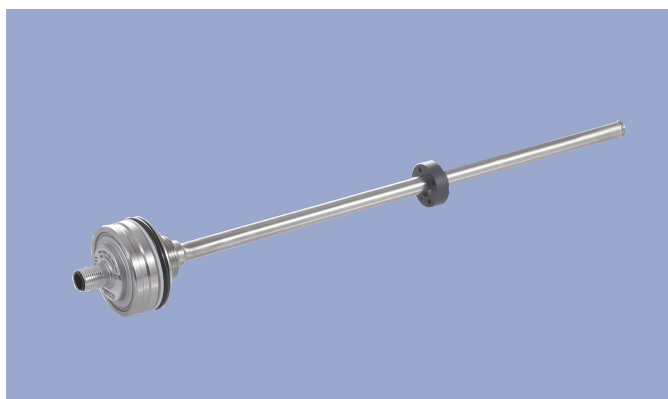
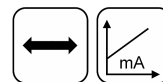


**NOVOSTRICTIVE  
Transducer  
Touchless**

**TM1**  
Plug-in Flange  
4 ... 20 mA  
**Industrial**



**Special Features**

- Compact design for tight spaces
- Touchless magnetostrictive measurement technology
- Operating pressure up to 350 bar, peaks up to 450 bar
- Non-contacting position detection with ring-shaped position marker
- Unlimited mechanical life
- No velocity limit for position marker
- Absolute output
- Outstanding accuracy performance up to 0.04 %
- Wide range of supply voltage
- Optimized for use in industrial applications
- Other configurations see separate data sheets

**Applications**

- Manufacturing Engineering
- Level measurement
- Actuators

The absolute linear transducer TM1 enables a compact and cost-effective position measurement. It consists of a stainless steel flange welded to a pressure-resistant rod and can therefore be used under harsh environmental conditions. The magnetostrictive measuring technology offers excellent accuracy for measuring lengths up to 2000 mm. The passive ring-shaped position marker allows a mechanically decoupled measurement.

**Description**

Material	Flange: SS 1.4307 / AISI 304L
	Flange cover: AISiMgBi
	Rod: SS 1.4571 / AISI 316Ti
	Sealing: O-ring FKM 80, Supporting ring: PTFE
Mounting	Plugged and secured in position with set screw M5 ISO 4026
Electrical connection	Connector M12x1, A-coded / Connector system M12x1, A-coded with lead wires

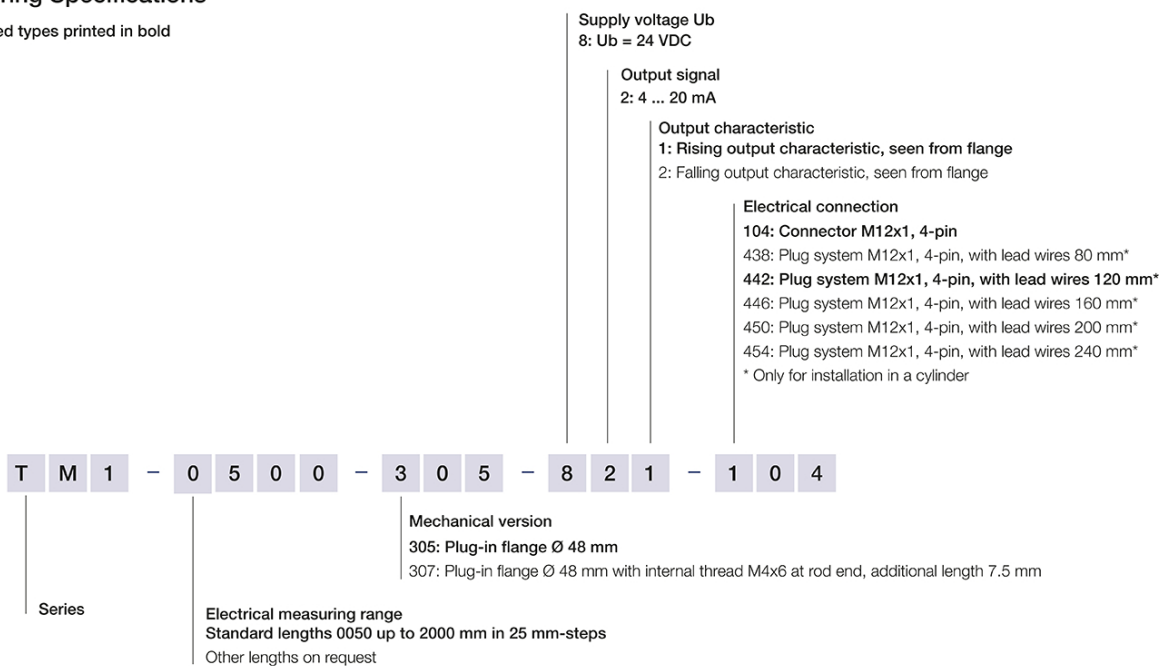
**Mechanical Data**

Dimensions	See dimension drawing
------------	-----------------------

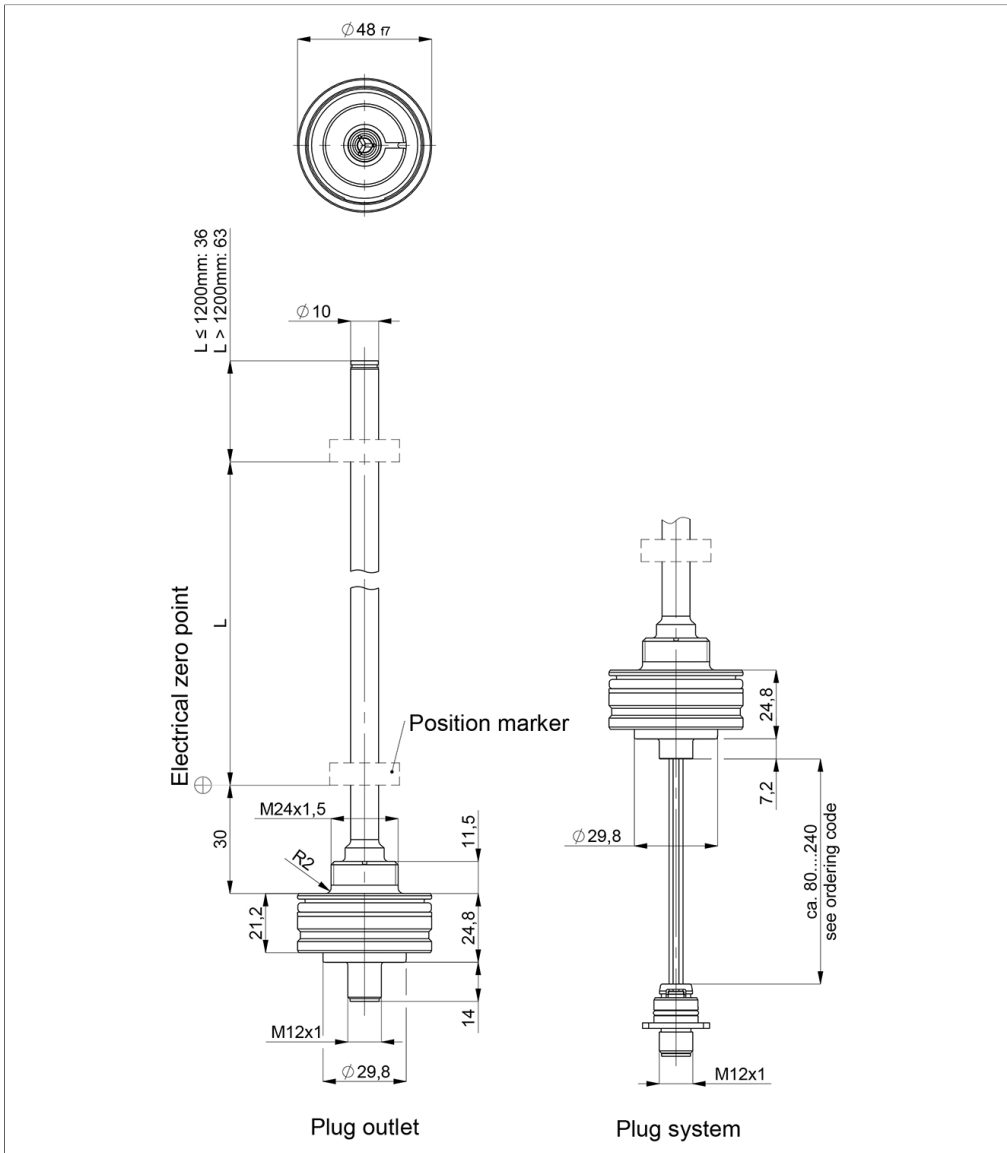
## Ordering Specifications

### Ordering Specifications

Preferred types printed in bold



**Drawing**



CAD data see  
[www.novotechnik.de/en/download/cad-data/](http://www.novotechnik.de/en/download/cad-data/)

## Technical Data

Type	TM1-____-305-82-_-_-
Output signal	4 ... 20 mA
Burden	@Ub 24 V: ≤ 500 Ω, @Ub 12 V: ≤ 250 Ω
Sampling rate / Update rate	0.5 kHz
Electrical measuring range (dim. L)	0 ... 50 mm up to 0 ... 2000 mm
Absolute linearity	≤ ±0.04 %FS (min. 300 μm)
Tolerance of electr. zero point	±1 mm
Resolution	≤ 0.1 mm
Repeatability	≤ ±0.1 mm
Hysteresis	≤ ±0.1 mm
Temperature error	typ. 50 ppm/K (min. 0.01 mm/K)
Supply voltage Ub	12/24 VDC (8 ... 32 VDC)
Supply voltage ripple	≤ 10% Ub
Power drain w/o load	< 1 W
Overvoltage protection	36 VDC (permanent)
Polarity protection	yes (-36 VDC)
Short circuit protection	yes (output vs GND and supply voltage up to 36 VDC)
Insulation resistance (500 VDC)	≥ 10 MΩ

### Environmental Data

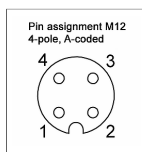
Max. operational speed	Mechanically unlimited
Vibration IEC 60068-2-6	20 g, 10 ... 2000 Hz, Amax = 0.75 mm
Shock IEC 60068-2-27	100 g, 11 ms (single hit)
Protection class DIN EN 60529	IP67 (Connector system M12, fastened, when correctly fitted in cylinder: IP69)
Operating temperature	-40 ... +105°C, -40 ... +85°C (connector system M12)
Operating humidity	0 ... 95 % R.H. (no condensation)
Working pressure	≤ 350 bar
Pressure peaks	≤ 450 bar
Burst pressure	> 700 bar
Life	Mechanically unlimited
Functional safety	If you need assistance in using our products in safety-related systems, please contact us
MTTF (IEC 60050)	355 years

### EMC Compatibility

EN 61000-4-2 ESD (contact/air discharge)	4 kV, 8 kV
EN 61000-4-3 Electromagnetic fields (RFI)	10 V/m
EN 61000-4-4 Fast transients (burst)	1 kV
EN 61000-4-6 Cond. disturbances (HF fields)	10 V eff.
EN 55016-2-3 Radiated disturbances	Industrial and residential area
	Only for connector system M12: Data applies only inside a cylinder. The EMC measurements are conducted in a reference cylinder. The EMC properties can deviate when using different cylinders.

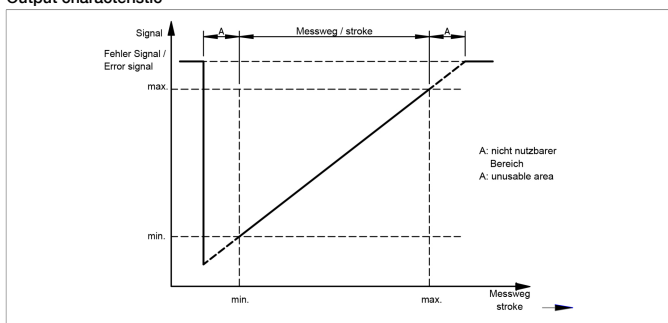
### Connection Assignment

Signal	Connector code 1__	Plug system code 4__
Supply voltage Ub	Pin 1	Pin 1
GND	Pin 3	Pin 3
Signal output	Pin 2	Pin 2
Do not connect	Pin 4	Pin 4
Connect cable shielding to protection earth		

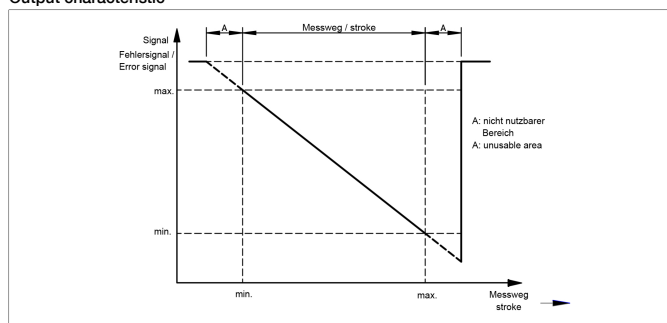


**Technical Data  
Output  
Characteristics**

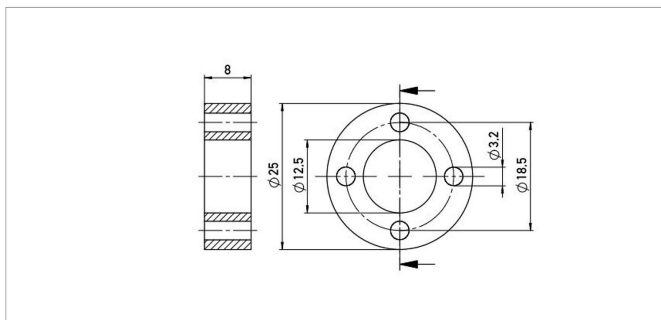
Output characteristic



Output characteristic



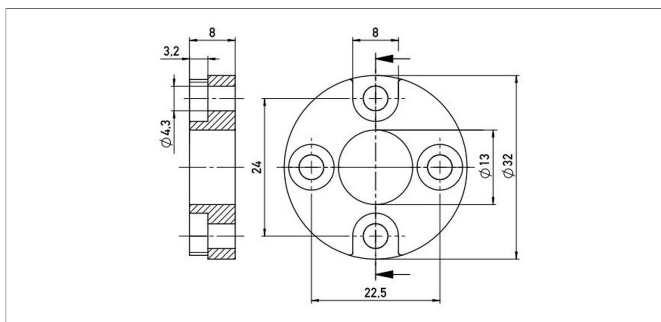
## Position Markers



### Z-TH1-P18

Ring position marker for fixation with screws M3  
Material PA6-GF  
Weight approx. 12 g  
Operating temp. -40 ... +100°C  
Surface pressure max. 40 N/mm<sup>2</sup>  
Fastening torque max. 100 Ncm  
of mounting

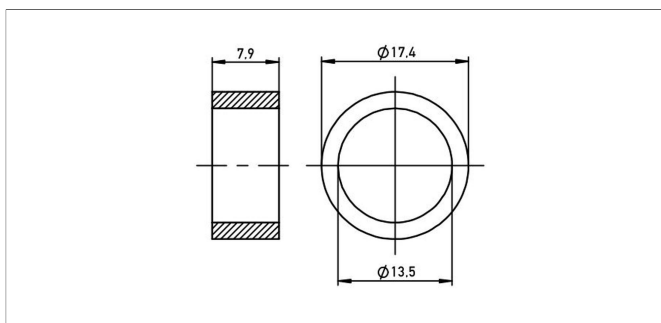
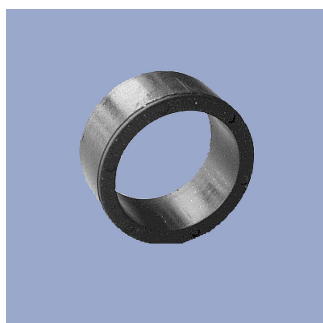
P/N	Pack. unit [pcs]
400005697	1



### Z-TH1-P19

Ring position marker for fixation with screws M4  
Material PA6-GF  
Weight approx. 14 g  
Operating temp. -40 ... +100°C  
Surface pressure max. 40 N/mm<sup>2</sup>  
Fastening torque max. 100 Ncm  
of mounting

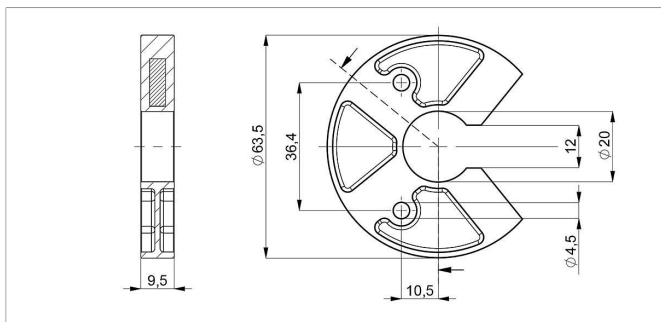
P/N	Pack. unit [pcs]
400005698	1



### Z-TIM-P20

Ring position marker for mounting via lock washer and retaining ring  
Material PA-Neonbond Compound  
Weight approx. 5 g  
Operating temp. -40 ... +100°C  
Surface pressure max. 10 N/mm<sup>2</sup>

P/N	Pack. unit [pcs]
400005699	1



### Z-TH1-P25

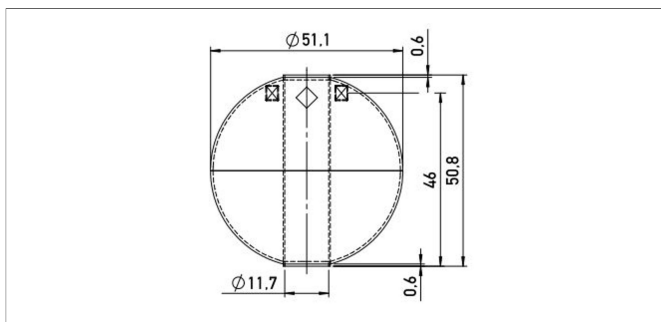
U-shaped position marker for fixation with M4 screws

Caution: for dimension of electrical zero point please follow the user manual!

Material PA6-GF  
Operating temp. -40 ... +105°C  
Surface pressure max. 40 N/mm<sup>2</sup>  
Fastening torque max. 100 Ncm  
of mounting

P/N	Pack. unit [pcs]
400105076	1

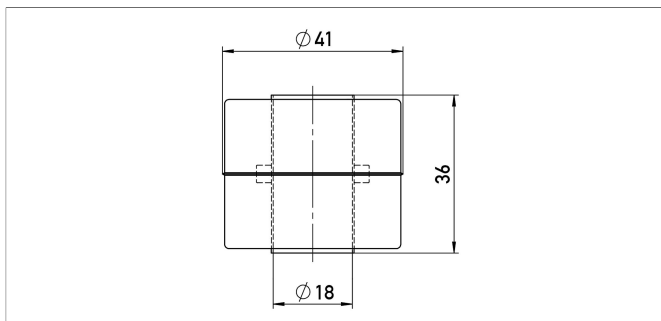
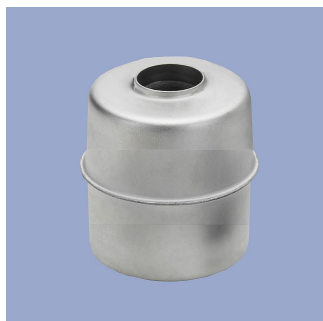
## Position Markers



### Z-TH1-P22

Ball-type floating position marker  
Material SS 1.4571 / AISI 316Ti  
Weight approx. 42 g  
Operating temp. -40 ... +100°C  
Compression strength  $\leq 60$  bar  
Density 720 kg/m<sup>3</sup>  
Immersion depth in water 36.7 mm

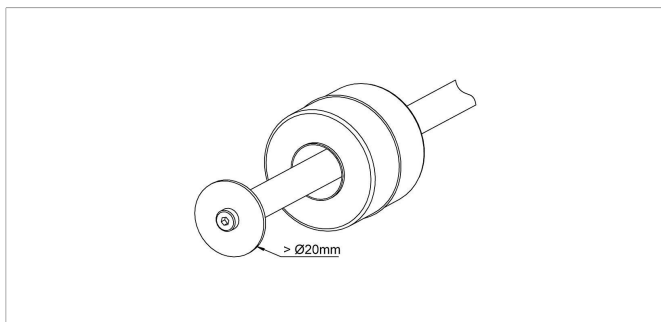
P/N	Pack. unit [pcs]
400056045	1



### Z-TH1-P21

Cylinder floating position marker  
Material SS 1.4404 / AISI 316L  
Weight approx. 20 g  
Operating temp. -40 ... +100°C  
Compression strength  $\leq 8$  bar  
Density 740 kg/m<sup>3</sup>  
Immersion depth in water approx. 26.6 mm

P/N	Pack. unit [pcs]
400056044	1

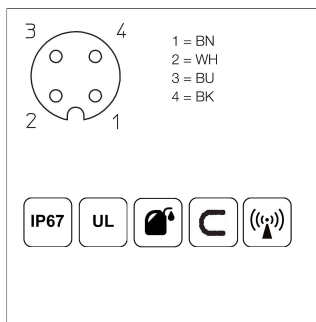
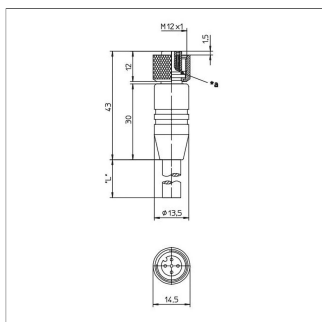
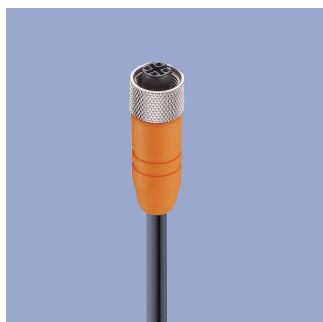


### Floating Position Marker - Installation Recommendation

When using floating position markers, we recommend to secure the marker against loss with a washer at the rod end.

For this purpose, a sensor version with inner thread at the rod end is required (s. ordering code).

## Connector System M12

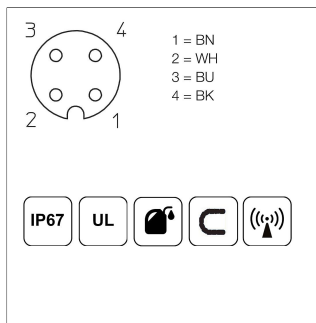
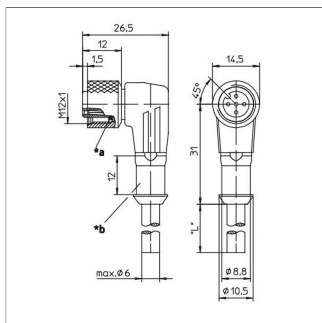
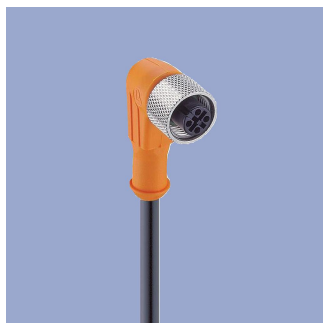


**EEM-33-32/62/97**  
M12x1 Mating female connector, 4-pin, straight, A-coded, with molded cable, shielded, IP67, open ended

Plug housing PA  
Cable sheath PUR, Ø = max. 6 mm, -25 ... +80°C (moved), -50 ... +80°C (fixed)

Lead wires PP, 0.34 mm<sup>2</sup>

P/N	Type	Length
400005600	EEM-33-32	2 m
400005609	EEM-33-62	5 m
400005650	EEM-33-97	10 m



**EEM-33-33/63/99**  
M12x1 Mating female connector, 4-pin, angled, A-coded, with molded cable, shielded, IP67, open ended

Plug housing PA  
Cable sheath PUR, Ø = max. 6 mm, -25 ... +80°C (moved), -50 ... +80°C (fixed)

Lead wires PP, 0.34 mm<sup>2</sup>

P/N	Type	Length
400005601	EEM-33-33	2 m
400005610	EEM-33-63	5 m
400005696	EEM-33-99	10 m

**IP67** Protection class IP67 DIN EN 60529

**IP68** Protection class IP68 DIN EN 60529

Very good Electromagnetic Compatibility (EMC) and shield systems

Very good resistance to oils, coolants and lubricants

**C** Suited for applications in dragchains

**UL** UL - approved

CAN-Bus



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