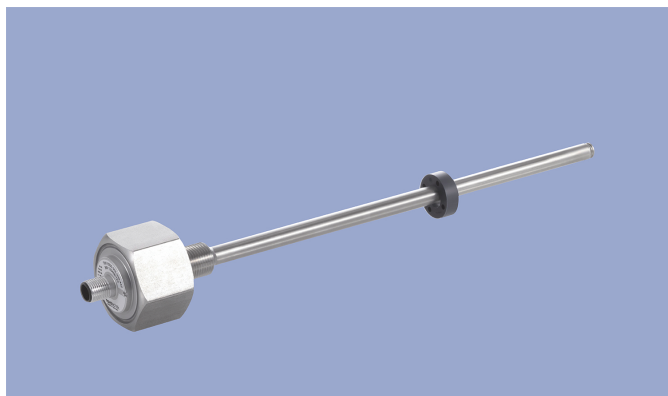
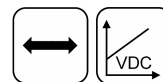


**NOVOSTRICTIVE  
Transducer  
Touchless**

**TM1**  
Screw flange  
Voltage  
**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: stainless steel 1.4307 / AISI 304L
	Flange cover: AISiMgBi
	Rod: stainless steel 1.4571 / AISI 316Ti
	Sealing: O-ring NBR 90 SH A
Mounting	Screwed via thread M18x1.5
Electrical connection	Connector M12x1, A-coded

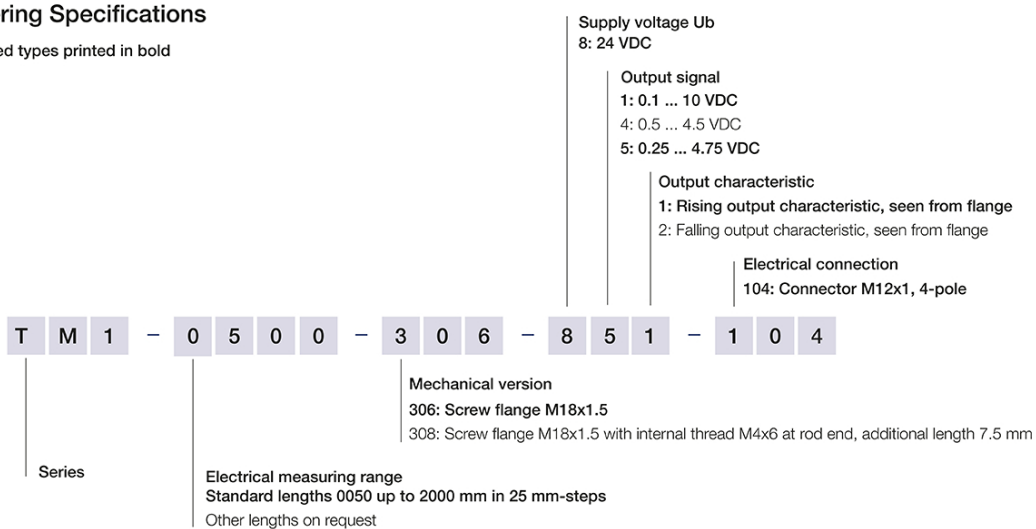
**Mechanical Data**

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

## Ordering Specifications

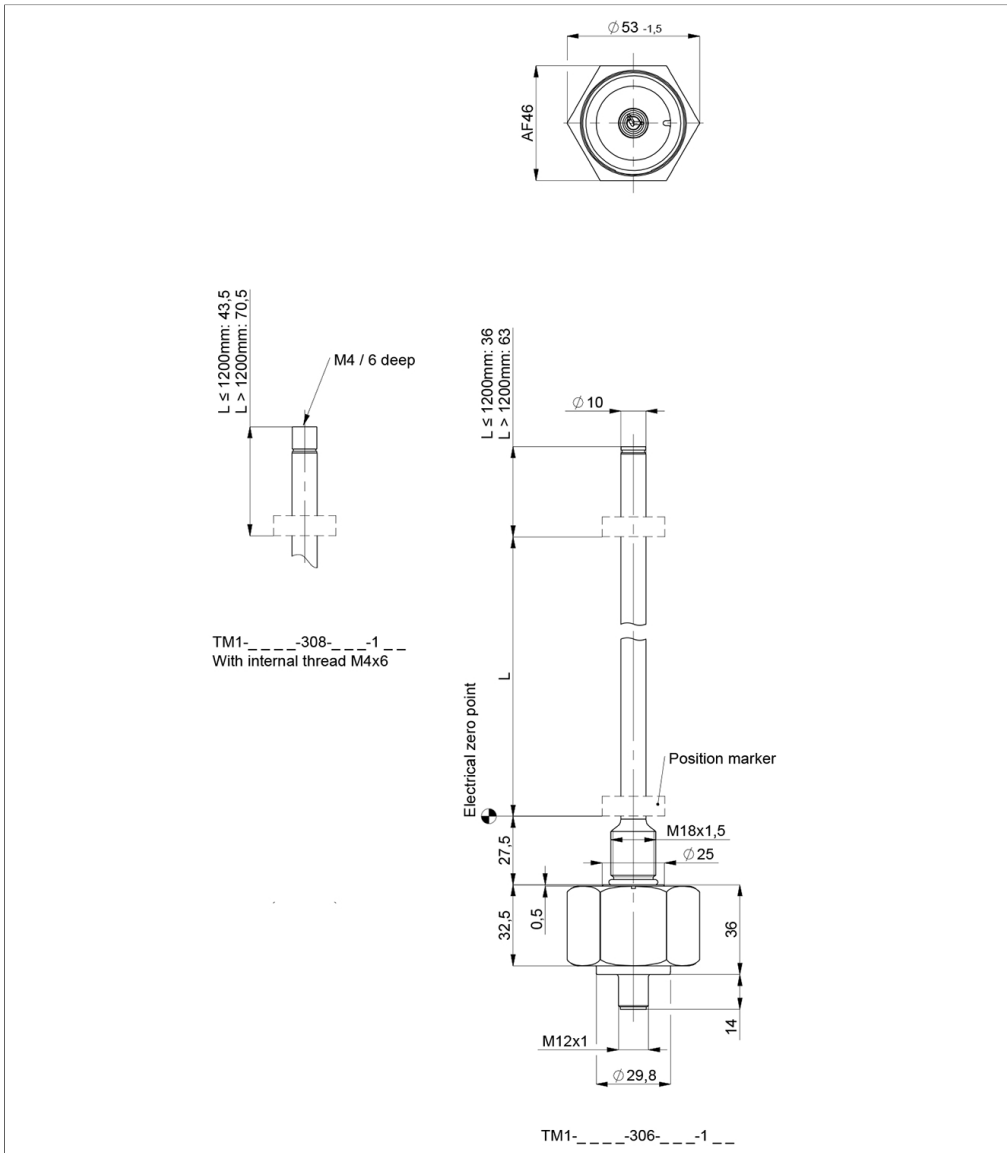
### Ordering Specifications

Preferred types printed in bold



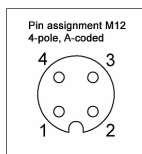
**Drawing**

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



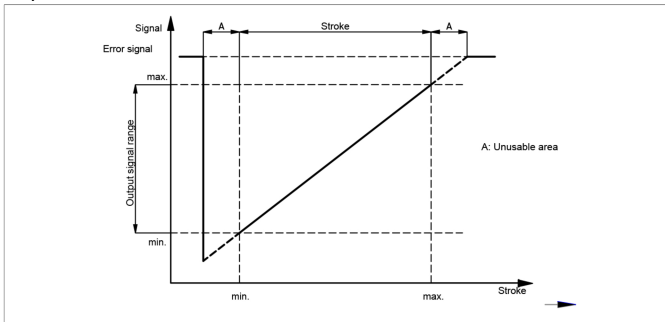
## Technical Data

Type	TM1-____-306-84_-104 TM1-____-306-85_-104	TM1-____-306-81_-104
Output signal	0.25 ... 4.75 V 0.5 ... 4.5 V	0.1 ... 10 V
Load	≥ 10 kΩ	
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)	24 VDC (16 ... 34 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	
<b>Environmental Data</b>		
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	
Operating temperature	-40 ... +105°C	
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)	346 years	
<b>EMC Compatibility</b>		
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	
<b>Connection Assignment</b>		
Signal	Connector code 1_ _	
Supply voltage Ub	Pin 1	
GND	Pin 3	
Signal output	Pin 2	
Do not connect	Pin 4	
	Connect cable shielding to protection earth	

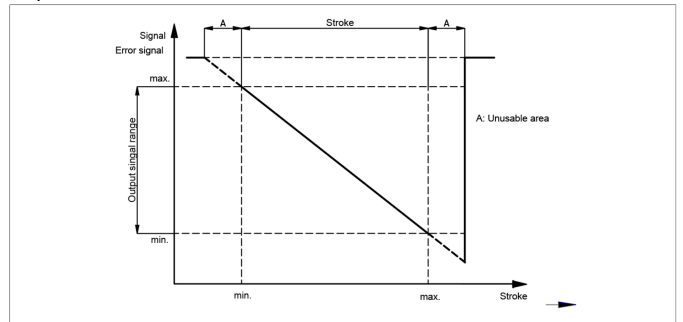


## Technical Data Output Characteristics

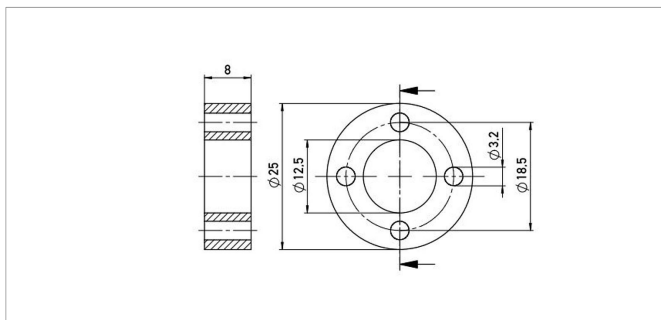
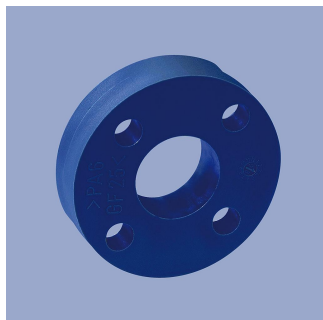
Output characteristic



Output characteristic



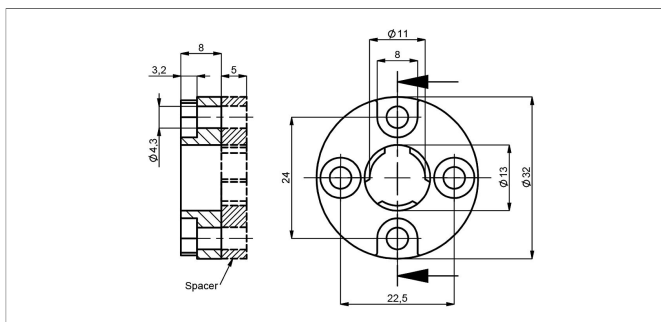
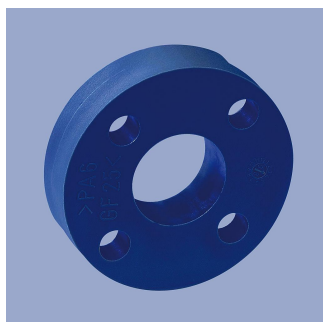
## Position Markers



### 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

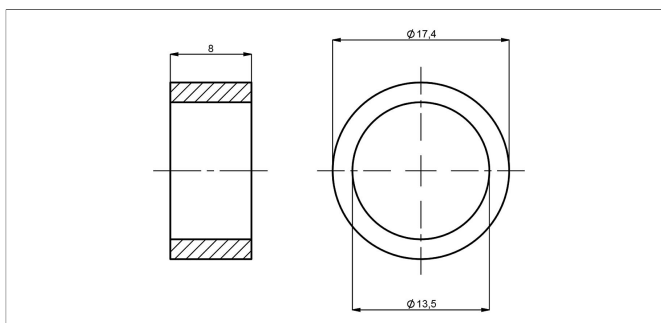
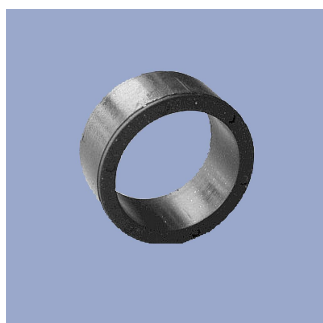


### Z-TH1-P19

#### Z-TH1-PD19 With spacer

Ring position marker for fixation with screws M4, optionally with or without spacer  
 Material PA6-GF, Spacer: POM-GF  
 Weight approx. 14 g  
 Operating temp. -40 ... +100°C  
 Surface pressure max. 40 N/mm<sup>2</sup>  
 Fastening torque max. 100 Ncm

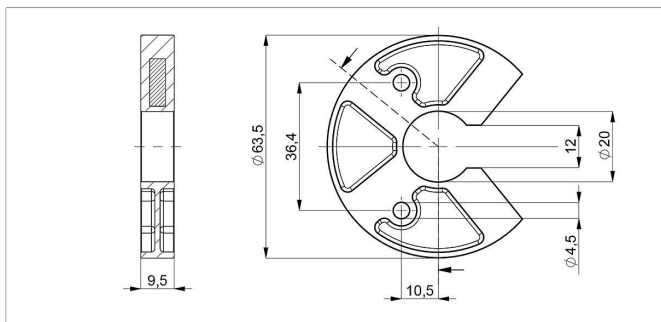
P/N	Spacer	Pack. unit [pcs]
400005698	-	1
400107117	incl.	1



### Z-TH1-P30

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

P/N	Pack. unit [pcs]
400106139	1



### Z-TH1-P25

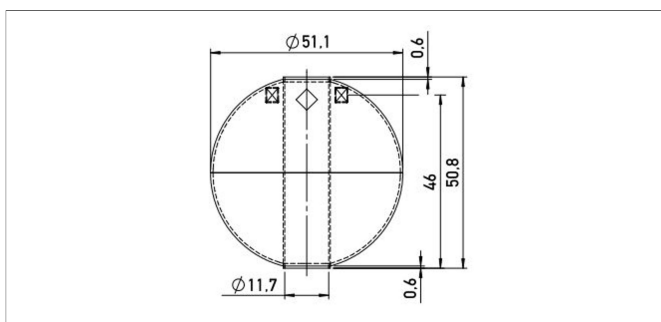
U-shaped position marker for fixation with M4 screws

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

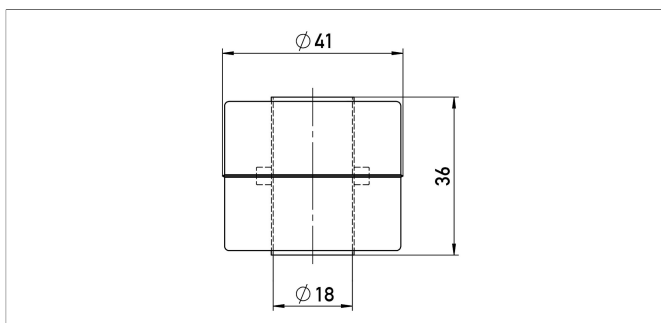
## Position Markers



### Z-TH1-P22

Ball-type floating position marker  
Material Stainless steel 1.4571  
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

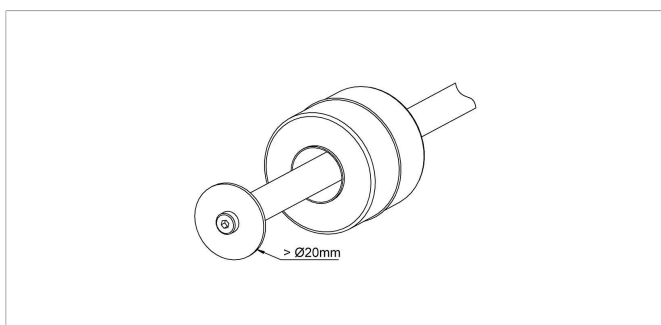
P/N	Pack. unit [pcs]
400056045	1



### Z-TH1-P21

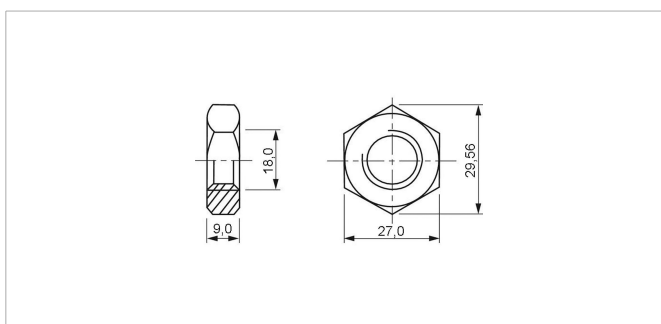
Cylinder floating position marker  
Material Stainless steel 1.4404  
Weight approx. 20 g  
Operating temp. -40 ... +100°C  
Compression strength  $\leq 8$  bar  
Density 740 kg/m<sup>3</sup>  
Immersion depth in water approx. 26.6 mm

P/N	Pack. unit [pcs]
400056044	1



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).

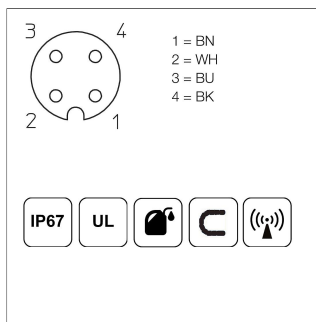
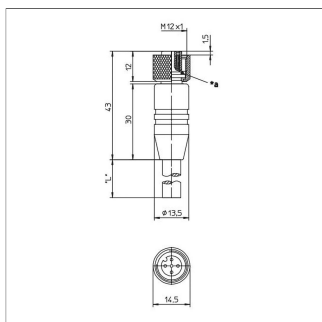
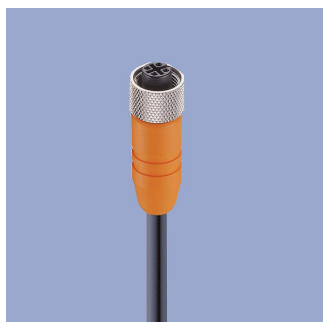


### Z-TH1-M01

Lock nut ISO 8675, M18x1.5-A2

P/N	Pack. unit [pcs]
400056090	1

## Connector System M12

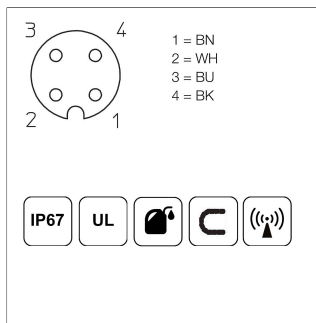
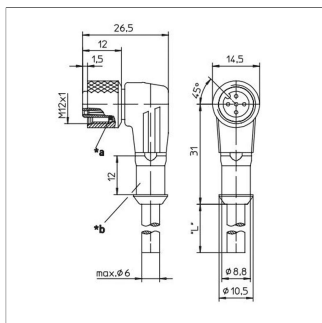
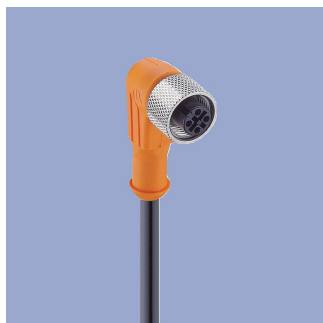


**EEM-33-32/62/97**  
M12x1 Mating female connector, 4-pin, straight, A-coded, with molded cable, shielded, IP67, open ended

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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