

Preliminary Data sheet

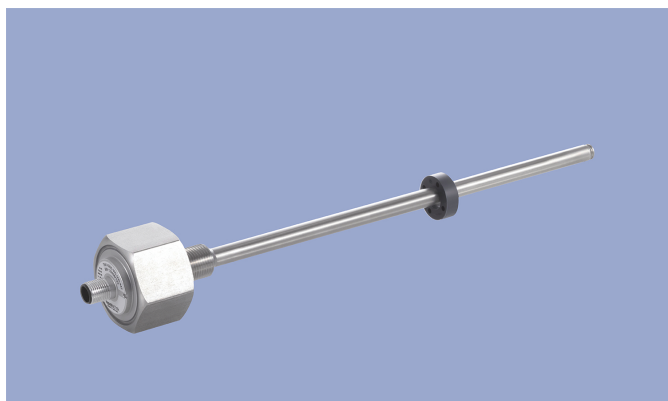
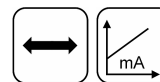
NOVOSTRICTIVE Transducer Touchless

TM1

Screw flange

4 ... 20 mA

Mobile Applications



Special Features

- For integration in pneumatic and hydraulic cylinders
- Touchless magnetostrictive measurement technology
- Operating pressure up to 350 bar, peaks up to 450 bar
- Ring-shaped position marker does not contact sensor
- 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 mobile applications with highest EMC requirements such as ISO pulses and high interferences to ISO 11452, exceeds E1 requirements
- Other configurations see separate data sheets

Applications

Hydraulic or pneumatic cylinders in

- Agricultural and forestry machinery
- Construction machines
- Vehicles with loading and unloading devices
- Vehicles with extension arms

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 into cylinder via bushing M18x1.5 for screw plug hole per ISO 6149
Electrical connection	Connector M12x1, A-coded / Cable 3x 0.5 mm ² (AWG 20), PUR, unshielded

Mechanical Data

Dimensions	See dimension drawing
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Ordering Specifications

Ordering specifications

Preferred types printed in bold

Supply voltage U_b
8: $U_b = 12/24$ VDC

Output signal
2: 4 ... 20 mA

Output characteristic
1: Rising output characteristic, seen from flange
2: Falling output characteristic, seen from flange

Electrical connection
104: Connector M12x1, 4-pin
251: Cable, 3-pole, unshielded, 1 m
253: Cable, 3-pole, unshielded, 3 m
255: Cable, 3-pole, unshielded, 5 m

T M 1 - **0 5 0 0** - **3 0 6** - **8 2 1** - **1 0 4**

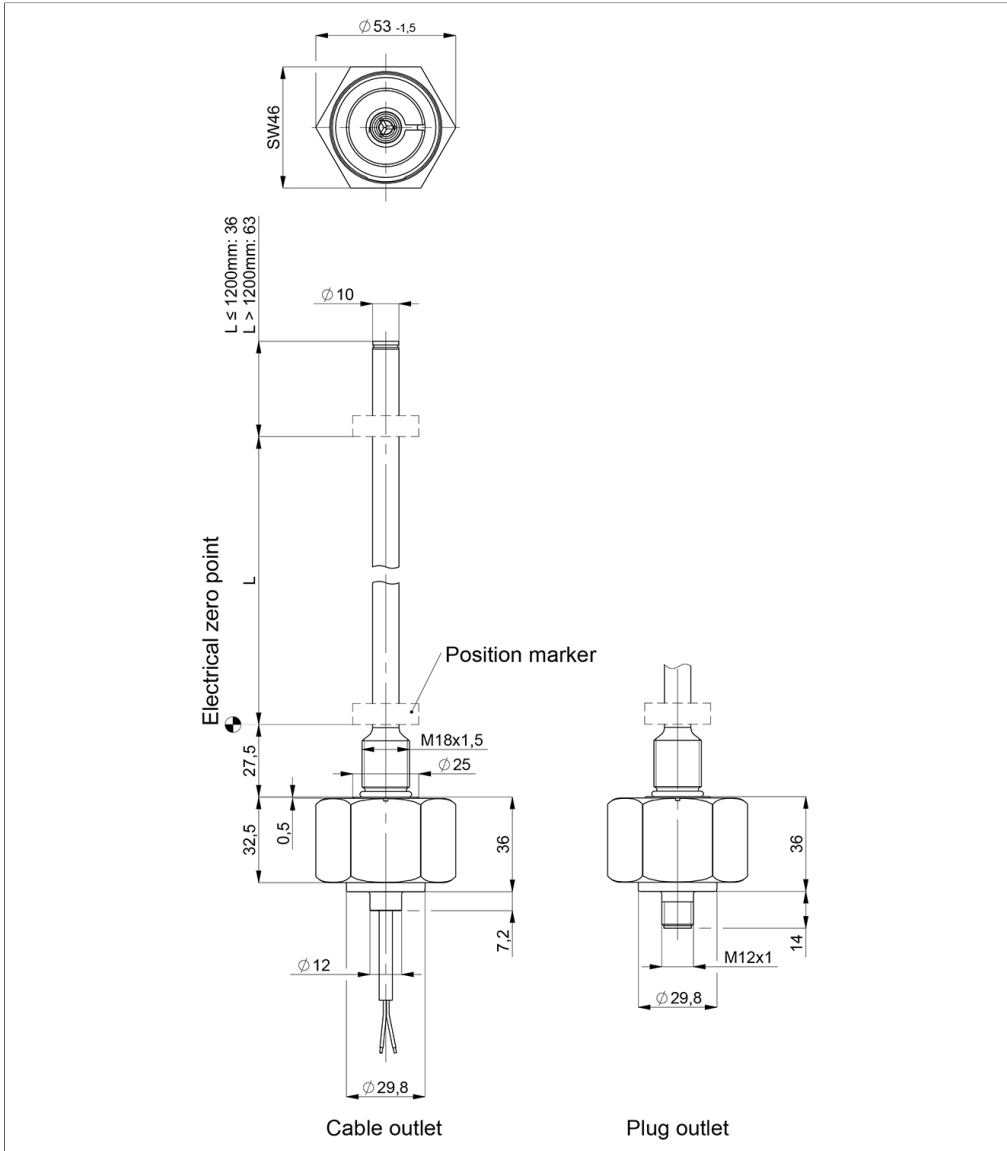
Series

Electrical measuring range
Standard lengths 0050 up to 2000 mm in 25 mm-steps
Other lengths on request

Mechanical version

306: Screw flange M18x1.5
308: Screw flange M18x1.5 with internal thread M4x6 at rod end, additional length 7.5 mm

Drawing



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

Technical Data

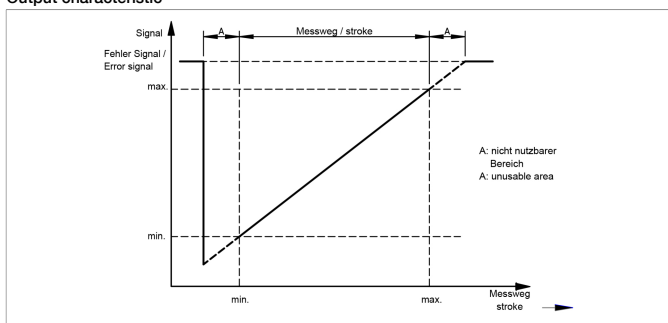
Type	TM1-____-306-82-_-_-
Output signal	4 ... 20 mA
Load / burden	@Ub 24 V: ≤ 500 Ω, @Ub 12 V: ≤ 250 Ω
Sampling rate / Update rate	0.5 kHz
Electrical measuring range (dim. L)	0 ... 50 mm up to 0 ... 2000 mm
Absolute linearity	≤ ±0.04 %FS (min. 300 μm)
Tolerance of electr. zero point	±1 mm
Resolution	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
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)	> 20 years
EMC Compatibility	
ISO 10605 ESD (Handling/Component)	8 kV / 15 kV
ISO 11452-2 Radiated HF-fields	100 V/m
ISO 11452-5 Radiated HF-Fields, stripline	200 V/m
CISPR 25 Radiated emission	Level 4
ISO 7637-2 Pulses on supply lines	(1, 2a, 2b, 3a, 3b) Level 4
ISO 16750 Pulses on supply lines	(4, 5) Level 4
ISO 7637-2 Transient Emissions	Level 3
ISO 7637-3 Pulses on output lines	Level 4
EN 13309 Construction machinery	
ISO 14982 Agricult./forestry machines	
The EMC measurements are conducted in a reference cylinder. The EMC properties can deviate when using different cylinders.	

Connection Assignment

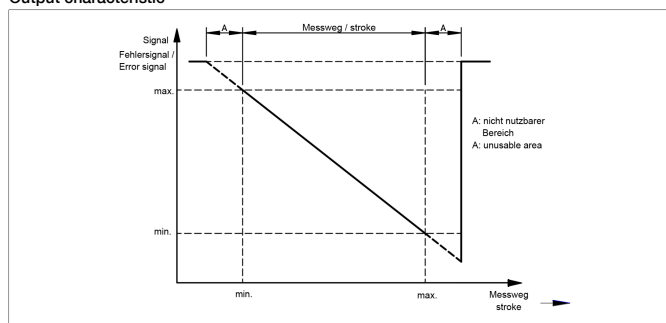
Signal	Connector code 1_ _	Cable code 2_ _
Supply voltage Ub	Pin 1	BN
GND	Pin 3	WH
Signal output	Pin 2	GN
Do not connect	Pin 4	-

**Technical Data
Output
Characteristics**

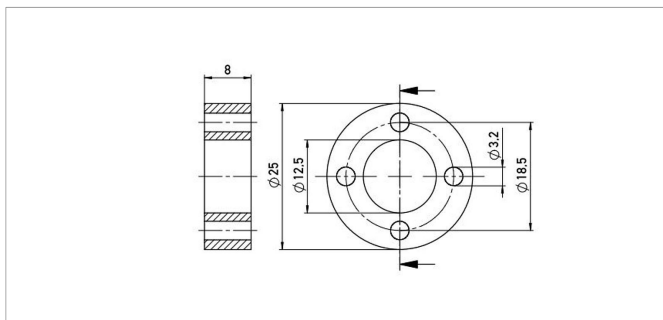
Output characteristic



Output characteristic



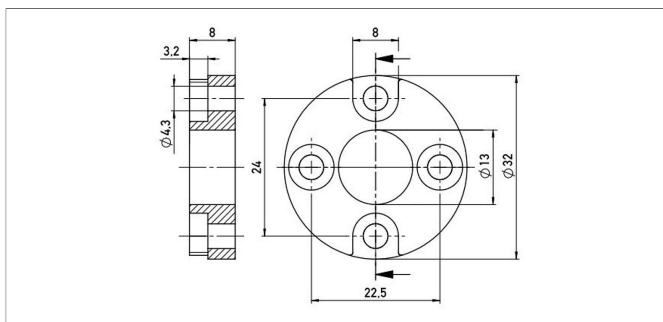
Position Markers



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/mm²
Fastening torque max. 100 Ncm
of mounting

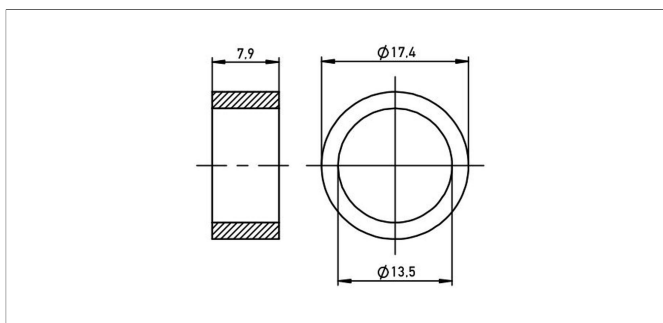
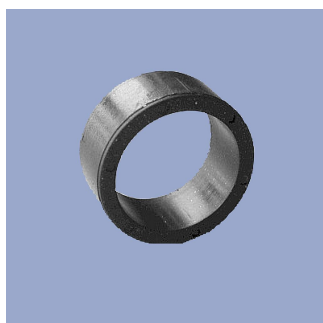
P/N	Pack. unit [pcs]
400005697	1



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/mm²
Fastening torque max. 100 Ncm
of mounting

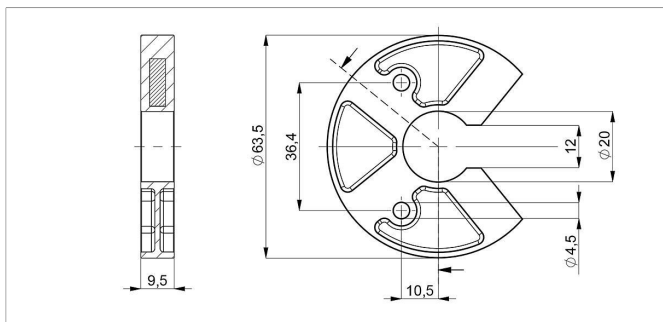
P/N	Pack. unit [pcs]
400005698	1



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/mm²

P/N	Pack. unit [pcs]
400005699	1



Z-TH1-P25

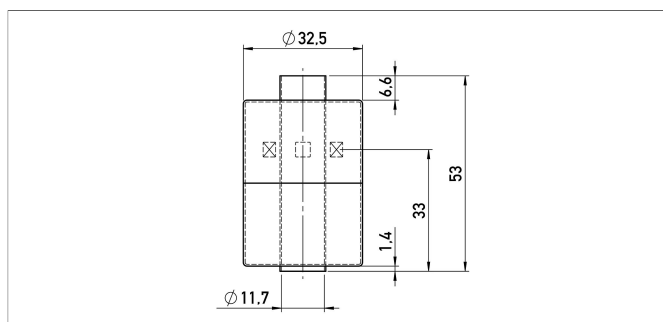
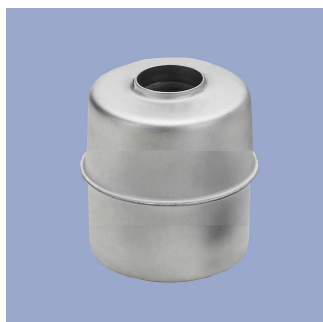
U-shaped position marker for fixation with M4 screws

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/mm²
Fastening torque max. 100 Ncm
of mounting

P/N	Pack. unit [pcs]
400105076	1

Position Markers



Z-TH1-P31

Cylinder floating position marker

Material Stainless steel 1.4404

Weight approx. 20 g

Operating temp. -40 ... +100°C

Compression strength ≤ 24 bar

Density 740 kg/m³

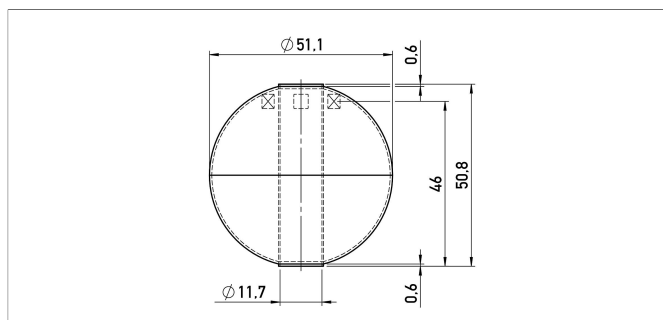
Immersion depth approx. 26.6 mm

in water

P/N	Pack. unit [pcs]
400105704	1

400105704

1



Z-TH1-P32

Ball-type floating position marker

Material Stainless steel 1.4571

Weight approx. 42 g

Operating temp. -40 ... +100°C

Compression strength ≤ 40 bar

Density 720 kg/m³

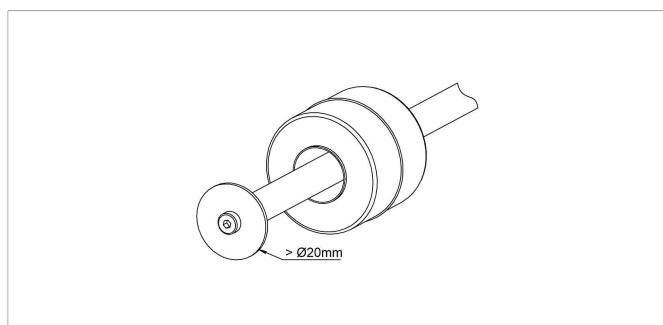
Immersion depth 36.7 mm

in water

P/N	Pack. unit [pcs]
400105703	1

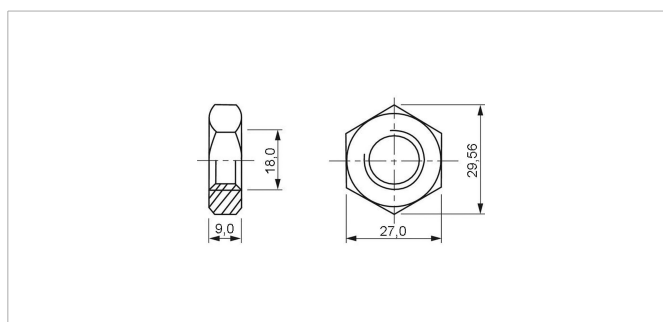
400105703

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

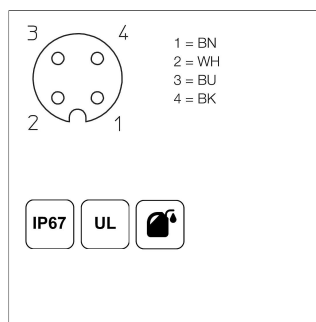
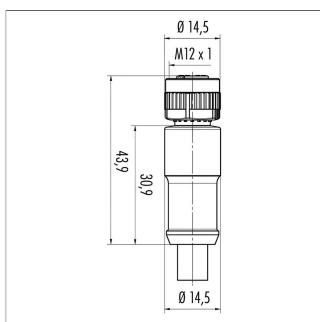
Lock nut ISO 8675, M18x1.5-A2

P/N	Pack. unit [pcs]
400056090	1

400056090

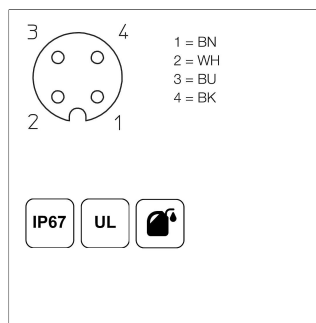
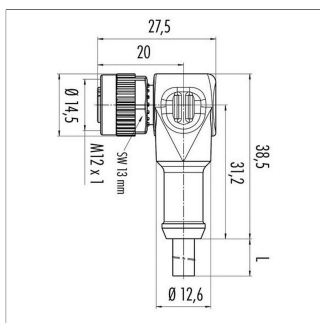
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Connector System M12



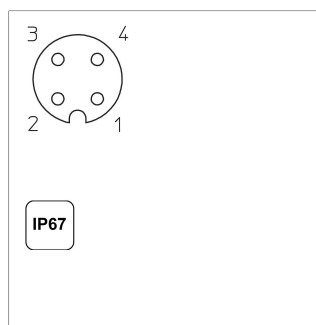
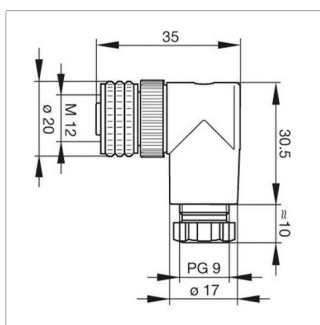
EEM-33-35/36/37
M12x1 Mating female connector, 4-pin, straight, A-coded, with molded cable, not shielded, IP67, open ended
Plug housing PA
Cable sheath PUR, Ø = max. 6 mm, -40 ... +85°C (fixed)
Lead wires PP, 0.34 mm²

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



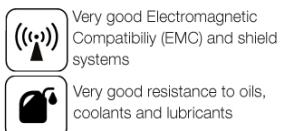
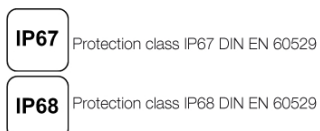
EEM-33-38/39/40
M12x1 Mating female connector, 4-pin, angled, A-coded, with molded cable, not shielded, IP67, open ended
Plug housing PA
Cable sheath PUR, Ø = max. 6 mm, -40 ... +85°C (fixed)
Lead wires PP, 0.34 mm²

P/N	Type	Length
400056138	EEM-33-38	2 m
400056139	EEM-33-39	5 m
400056140	EEM-33-40	10 m



EEM-33-89
M12x1 Mating female connector, 4-pin, angled, A-coded, with coupling nut, screw termination, IP67, not shieldable
Operating temp. -25 ... +90°C
Plug housing PBT
For wire gauge 6 ... 8 mm, max. 0.75 mm²

P/N	Type
400005634	EEM-33-89



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© Sep 19, 2019

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