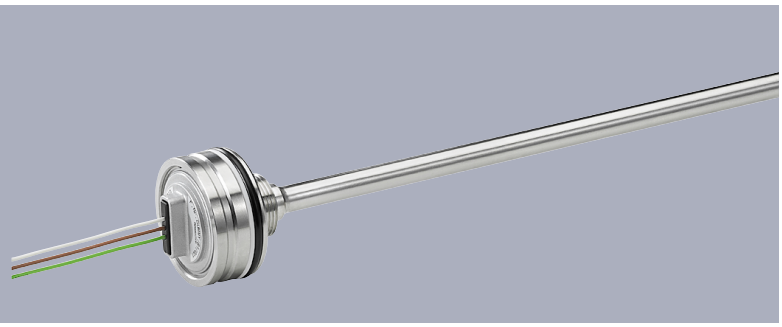
novotechnik
Siedle Group

Transducer up to 2500 mm touchless absolute

Series TIM



Special features
- rod style transducer
- for integration in pneumatic and hydraulic cylinders
- touchless magnetostrictive measuring process
- non-contact guiding with ring-shaped position marker
- unlimited mechanical life
- no speed limit for position marker
- absolute output voltage or current
- outstanding accuracy performance up to 0,04 %
- operating pressure up to 350 bar, peaks up to 450 bar
- wide range of supply voltage
- EMC for mobile applications
- immunity against HF fields up to 200 V/m
- screw flange M18x1,5 or plug-in flange Ø 48 mm
- optionally plug or cable connection
- M12 plug system allows easy integration into cylinder

This absolute position transducer can be integrated directly in the pressurized zone of pneumatic and hydraulic cylinders, thereby providing compact and cost-effective position sensing.

The transducer consists of a stainless steel flange welded on a stainless steel pressure-proof rod. Signal processing electronic is completely build-in the flange. The transducer rod fits into thebored piston rod. The position marker is mounted on the piston bottom.

The complete transducer is mounted inside the cylinder and protected against external influences. This feature with highest durability is favoured especially for mobile applications in harsh environments. Mounting is also possible in clevis-head cylinders or any space limited cylinder applications.

The touchless magnetostrictive measuring process offers superior accuracy and high dynamics. The measuring process is independent from environmental media like hydraulic liquids.

The high mechanical ruggedness of the transducer combined with the underlying measuring technique means that the system is highly resistant to shock and vibration.

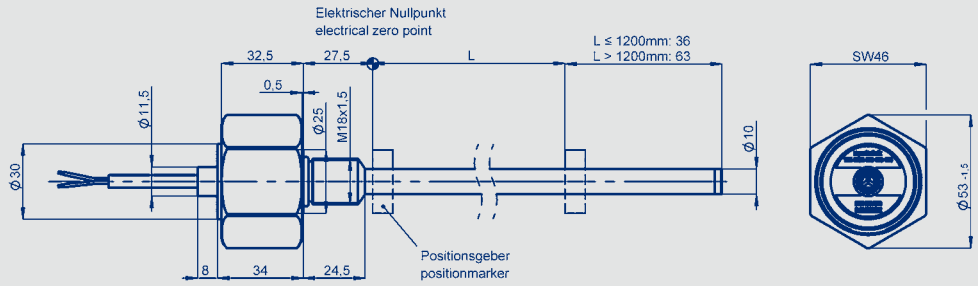
The measurement is accomplished using a passive ring-shaped position marker which can be moved as a free-floating element. The touchless coupling makes installation even simpler.

The wear-free operation means unlimited mechanical life and unlimited operating speed of the position marker and permits stroke lengths up to 2500 mm.

The transducer's integrated signal processing transforms the position information directly into a market standard voltage or a current signal. At the output an absolute signal is provided, thus no additional signal conditioner is required.

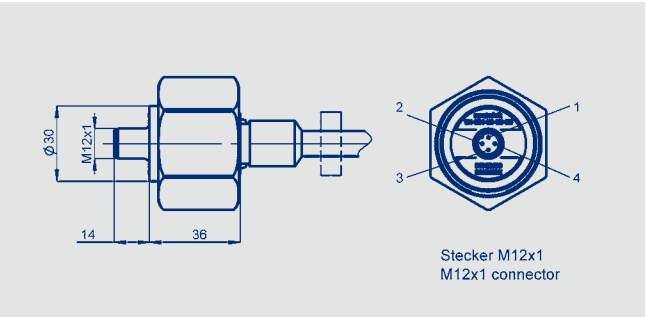
The transducer complies with the usual EMC requirements of agricultural and forest machines and vehicles.

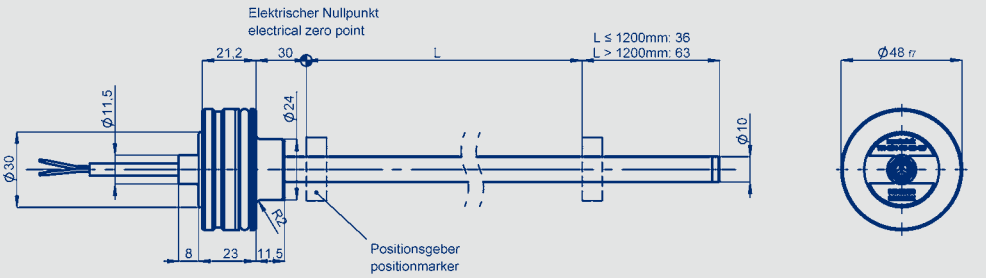
Description	
Housing	Rod and flange stainless steel
Mounting	Bushing M18x1.5 for screw plug hole per ISO6149 Plug-in flange Ø 48f7 for mounting bore Ø 48H8
Position marker	Ring position marker, plastic
Measuring principle	Touchless, magnetostrictive
Electrical connection	4-pin round connector, unshielded, M12x1 (only screw flange) 3-wire PUR / PVC cable, 3 x 0.5 mm^2, unshielded: 1 m, 3 m, 5 m or 10 m length 4-pin plug system M12x1 with wires (PVC), several standard lengths (IP69K)



Schraubflansch M18x1,5
Elektrischer Anschluss optional:
Kabel
Stecker M12x1

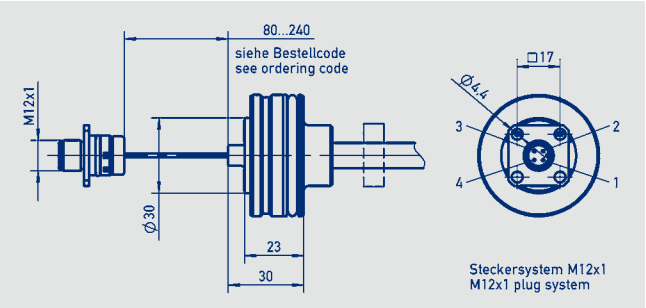
Screw flange M18x1,5
Electrical connection options:
Cable
Plug M12x1





Steckflansch Ø48
Elektrischer Anschluss optional:
Kabel
Steckersystem M12x1

Plug-in Flange Ø48
Electrical connection options:
Cable
Plug system M12x1



Type designations	TIM - _ _ _ _ - 3 _ _ -841- _ _ _ TIM - _ _ _ _ - 3 _ _ -851- _ _ _	TIM - _ _ _ _ _ - 3 _ _ -911- _ _ _	TIM - _ _ _ _ - 3_ _ -821- _ _ _	
Mechanical Data				
Dimensions	see drawing			
Electrical Data				
Electrical measuring range (dimension L)	0050 up to 2500 0050 up to 1000 in 50 mm steps, 1000 up to 2000 in 100 mm steps, 2000 up to 2500 in 250 mm steps. Other lengths in 10 mm steps on request.			mm
Independent linearity	50 ... 250 mm: ≤ ± 0,1 260 ... 2000 mm: ≤ ± 0,04 2010 ... 2500 mm: ≤ ± 0,8			mm % F.S. mm
Tolerance of electr. end point	≤ 1			mm
Output signal	0.5 ... 4.5 VDC 0.25 ... 4.75 VDC (load ≥ 10 kΩ)	0.1 ... 10.0 VDC (load ≥ 10 kΩ)	4.0 ... 20.0 mA (burden ≤ 500 Ω at 24 VDC) (burden ≤ 250 Ω at 12 VDC)	
Update rate	> 500			Hz
Resolution	typ. 0.1			± mm
Repeatabiity	0.1			± mm
Hysteresis	0.1			± mm
Supply voltage Ub	8 ... 32	16 ... 32	8 ... 32	VDC
Supply voltage ripple	< 1			% ss
Power drain without load	< 1			W
Temperature coefficient	typ. 50			ppm/K
Overvoltage protection	36 (GND- Ub)			VDC
Polarity protection	-36			VDC
Insulation resistance (500 VDC)	≥ 10 (GND vs. housing, for 60 s)			MΩ
Environmental Data				
Operating temperature range	-40 ... +105 with cable connection and M12 plug system -40 ... +85 with M12 connector			°C °C
Operating humidity range	0...90 (no condensation)			% R.H.
Shock per IEC 60068-2-27	100 (11 ms) (single hit)			g
Vibration per EIC 60068-2-64	20 (r.m.s.) (10...2000 Hz)			g
Protection class per DIN EN 60529	IP67 (M12x1 plug system IP69K, plugged)			
Pressure rating Working pressure Pressure peaks Static test pressure	 ≤ 350 ≤ 450 ≤ 600			 bar bar bar
Operating speed of position marker	unlimited (mechanical)			ms-1
Functional safety	When using our products in safety-related systems please contact us			
EMC compatibility*	ISO 14982 Agricultural and forestry machines EN 13309 Construction machines ISO 10605 Packaging and Handling + Component Test (ESD) ISO 11452-2 Radiated EM HF-Fields, Absorberhall 200 V/m ISO 11452-4 BCI (Bulk Current Injection) 200 mA CISPR25 Radiated Emission ISO 7637-1/2 Transient Impulses			

*) The EMC measurements were accomplished in a reference cylinder. The values can deviate when using different cylinders.

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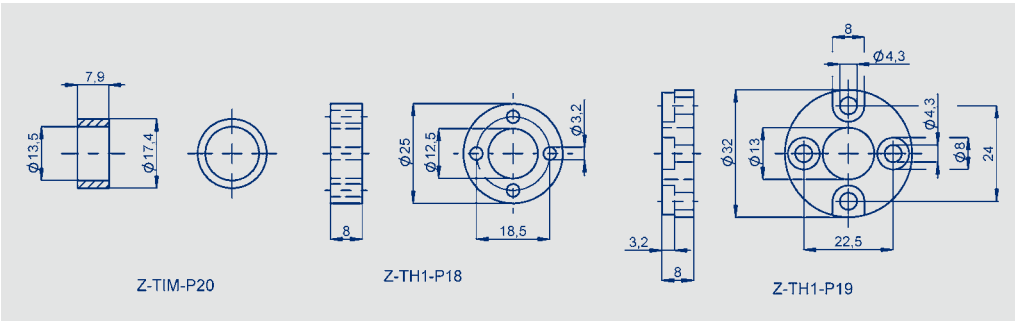

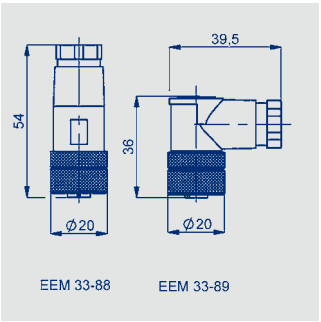

Ordering specifications

Operting voltage
8: Ub = 12/24 V (8...32 V) mobile electronic
9: Ub = 24 V (16...34 V) mobile electronic

Output signal at Ub = 12 / 24 V
2: 4 ... 20 mA
4: 0.5 ... 4.5 V
5: 0.25 ... 4.75 V

Output signal at Ub= 24 V
1: 0 .1 ... 10 V

Output characteristics
1: Positive gradient, seen from flange

Electrical connection
104: 4-pin round connector M12x1
251: 3-pin cable, 1.0 m, unshielded
253: 3-pin cable, 3.0 m, unshielded
255: 3-pin cable, 5.0 m, unshielded
260: 3-pin cable, 10 m, unshielded
438: Plug system M12x1 with wires 80 mm
442: Plug system M12x1 with wires 120 mm
446: Plug system M12x1 with wires 160 mm
450: Plug system M12x1 with wires 200 mm
454: Plug system M12x1 with wires 240 mm

T	I	M	–	0	5	0	0	–	3	0	5	–	8	5	1	–	2	5	1

Series

Electrical measuring range
Standard lengths from 0050 up to 2500 mm

Mechanical version
305: Plug-in flange Ø 48 mm, rod Ø 10.0 mm
306: Screw flange M18x1.5, rod Ø 10.0 mm

Output connector Code 103, 4 _ _	Output cable Code 2 _ _	Pin assignment
PIN 1	BN brown	Supply Ub
PIN 2	GN green	Output signal
PIN 3	WH white	GND
PIN 4	-	do not connect

Potential differences between supply GND and signal GND must be avoided.

Required accessories

Ring position marker
Z-TH1-P18, P/N 005697;
Z-TH1-P19, P/N 005698;
Z-TIM-P20, P/N 005699.
Floating position marker
Z-TMI-P10, P/N 005662,
Z-TMI-P11, P/N 005663
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Required accessories

Female connector M12x1, 4-pin straight, with molded cable, shielded, IP67, open-ended:
Length 2 m, P/N 005600, EEM 33-32:
Length 5 m, P/N 005609, EEM 33-62:
Length 10 m, P/N 005650, EEM 33-97.
Female connector M12x1, 4-pin, angled, with molded cable, shielded, IP67, open-ended:
Length 2 m, P/N 005601, EEM 33-33:
Length 5 m, P/N 005610, EEM 33-63:
Length 10 m, P/N 005696 EEM 33-99.
Female connector M12x1, 4-pin, straight, with coupling nut, screw terminals connection, IP67, not shielded, P/N 005633, EEM 33-88;
Female connector M12x1, 4-pin, angled, with coupling nut, screw terminals connection, IP67, not shielded, P/N 005634, EEM 33-89.

Other position markers on request.
See also data sheet accessories.