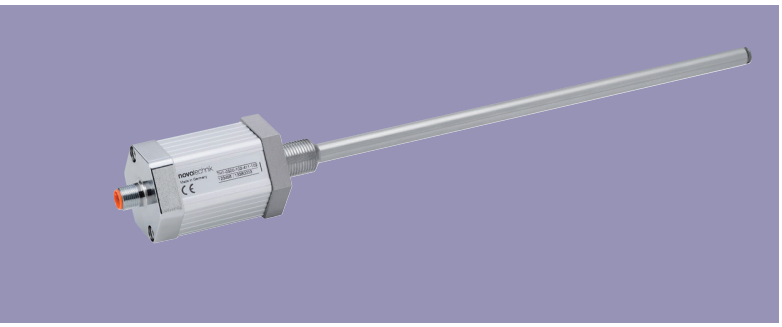
novotechnik
Siedle Group

NOVOSTRICTIVE Transducer up to 4250 mm touchless absolute

Series TH1 with analog Interface



Special features

- rod style integrable transducer
- NOVOSTRICTIVE touchless magnetostrictive measuring process
- Standard output signals current or voltage
- non-contact position detection
- wear-free, unlimited mechanical life
- excellent linearity up to 50 µm
- resolution up to 1 µm regardless of stroke length
- position Teach-In via programming-input
- low temperature coefficient <30 ppm/K
- insensitive to shock and vibration
- cable or connector version available
- operating pressure up to 350 bar
- protection class IP67 / IP68

Transducers employing the NOVOSTRICTIVE touchless magnetostrictive measuring process for direct, precise and absolute measurement of travel and length in control, positioning and measuring technology.

The measurement is accomplished using a passive position marker which can be moved as a free-floating element.
The non-contact coupling makes installation even simpler, and the wearfree operation means unlimited mechanical life and unlimited operating speed of the position marker and permits stroke lengths up to 4250 mm.

The temperature coefficient of the transducer is extremely low thanks to the measuring principle, design and selected materials.

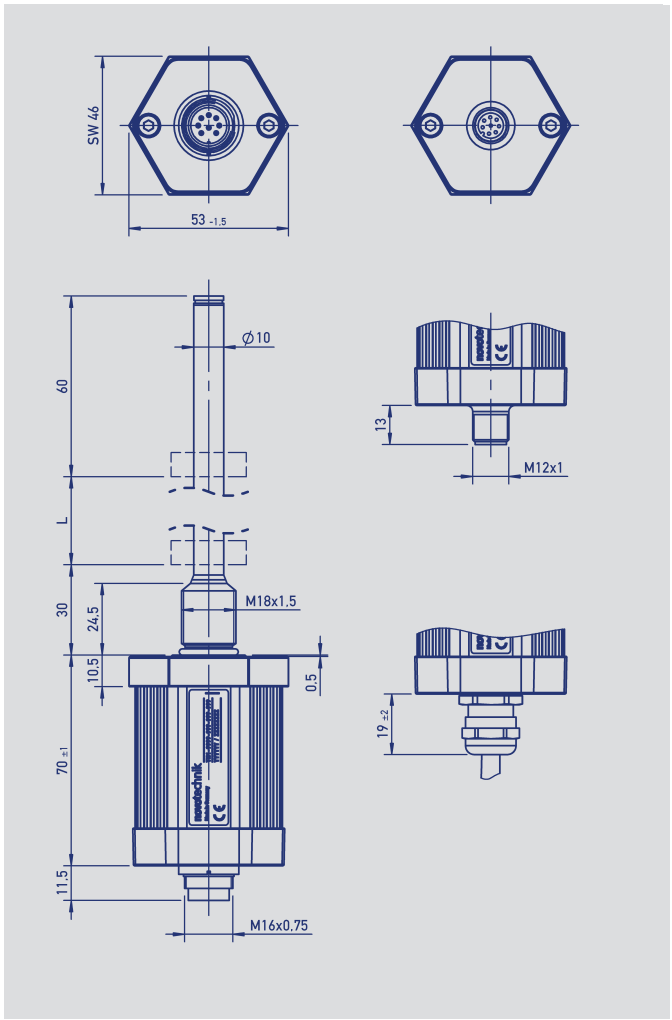
The high mechanical ruggedness of the transducer combined with the underlying measuring technique mean that the system is highly resistant to shock and vibration.
The rod-shape of the transducer allows integration in the pressurized zone of hydraulic and pneumatic cylinders.
The contactless ring-shaped magnet ensures simple fitting of the transducer.

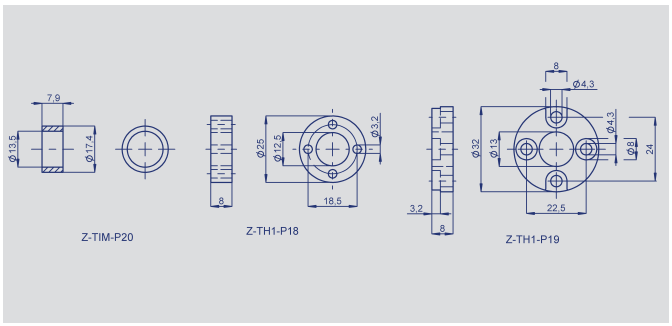
A sophisticated ASIC in the transducer provides for standard absolute output signals.

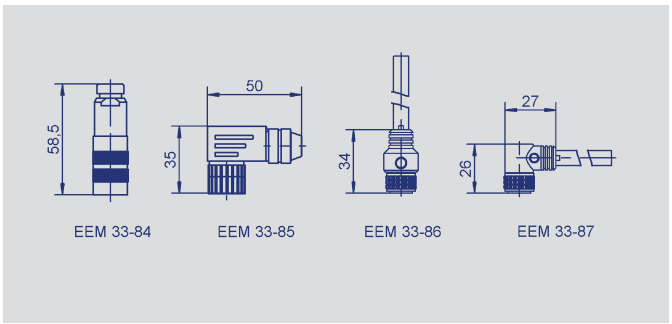
As a standard the analog interfaces offer a teach-in function via the electrical connection.

Additional interfaces see separate data sheet.

Description	
Housing	Aluminium, anodized. Rod: stainless steel
Mounting	Bushing M18x1.5 for screw plug hole per ISO6149
Position marker	Ring position marker
Measuring principle	NOVOSTRICTIVE, touchless magnetostrictive
Electrical connections	8-pin round connector, shielded, M12x1 8-pin round connector, shielded, IEC130-9 6-pin round connector, shielded, IEC130-9 8-wire PUR / PVC-cable, 8x0.25 mm², shielded: 1 m, 3 m or 5 m length
Electronic	SMD with ASIC, integrated Connector casing resp. shield is connected to the sensor housing. Housing is capacitively decoupled from the electronic







Output connector Code 101, 102	Cable Code 201, 203, 205	Connector with cable EEM33-86, EEM33-87	Analog current	Analog voltage
PIN 1	YE	WH	0(4) ... 20 mA	do not connect
PIN 2	GY	BN	signal GND	signal GND
PIN 3	PK	GN	do not connect	+10 ... 0(-10) VDC
PIN 4	RD	YE	DIAG *	DIAG *
PIN 5	GN	GY	do not connect	0(-10) ... +10 VDC
PIN 6	BU	PK	supply GND	supply GND
PIN 7	BN	BU	+24 VDC	+24 VDC
PIN 8	WH	RD	PROG *	PROG *

*) connect only for Teach-In function (see manual).

Output connector Code 103	Analog voltage	Analog current
PIN 1	0...10 VDC	0 (4)...20 mA
PIN 2	signal GND	signal GND
PIN 3	10...0 VDC	do not connect
PIN 4	supply GND	supply GND
PIN 5	+24 VDC	+ 24 VDC
PIN 6	supply GND	supply GND

Type designations	TH1 - _ _ _ _ - _ _ _ - 41 _ - _ _ _ Analog voltage	TH1 - _ _ _ _ - _ _ _ - 42 _ - _ _ _ Analog current	
Mechanical Data			
Dimensions	see drawing		
Electrical Data			
Electrical measuring range (dimension L)	0050 up to 4250 0050 up to 1000 in 25 mm steps, 1100 up to 2000 in 100 mm steps, 2250 up to 4250 in 250 mm steps; Other lengths on request.		mm
Absolute linearity	≤ ± 0.02 (min. ± 50 µm) **		± % FS
Tolerance of electrical zero point	± 0.5 (min. 2 x reproducibility)		mm
Output signal	Voltage 0.1 ... 10 VDC (load ≥ 5 kΩ)	Current 0.1 ... 20 mA (burden max. 500 Ω) 4 ... 20 mA (burden max. 500 Ω)	
Resolution	16		bit
Reproducibility	≤ 0.03		% FS
Hysteresis	≤ 0.01		% FS
Supply voltage Ub	24 (19 ... 30)		VDC
Supply voltage ripple	≤ 10		% Vss
Current consumption (w/o load)	≤ 100		mA
Output update rate max. *	16		kHz
Temperature coefficient	≤ 30 (min. 0.01 mm/K)		ppm/K
Overvoltage protection	40 (temporary / 1 min.)		VDC
Polarity protection	up to Umax		VDC
Short circuit protection	up to Umax		VDC
Insulation resistance (500 VDC)	≥ 10		MΩ
Environmental Data			
Temperature range	-40 ... +85		°C
Storage temperature range	-40 ... +100		°C
Operating humidity range	0...95 (no condensation)		% R.H.
Life	mechanically unlimited		
MTTF (ISO 13849-1, parts count method, w/o load)	28		years
Functional safety	When using our products in safety-related systems please contact us		
Shock (IEC 60068-2-27)	100 (11 ms)		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		
Pressure rating Working pressure Pressure peaks Burst pressure	 ≤ 350 ≤ 600 > 700		 bar bar bar
Max. operating speed with valid output signal	10		ms^{-1}
Max. operating acceleration with valid output signal	200		ms^{-2}
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) 1 kV EN 61000-4-6 conducted disturbances, induced by RF fields 10 V/m eff. EN 61000-4-8 Power frequency magnetic fields 3 A/m EN 55016-2-3 Radiated distrubances class B		

* Data are extrapolated, internal update rate depending on length.

** Valid for channel 1. Additional offset and gradient tolerances for channel 2. Measured with standard position marker Z-TH1-P18 or Z-TH1-P19.

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Ordering specifications

Preferred types printed in bold

Electrical interface
4: Analog interface

Output signal analog interface 4 _ _
1: Voltage output
2: Current output

Analog interfaces voltage output 41_
1: 0 V ...10 V and 10 V ...0 V

Analog interfaces current output 42_
1: 0 mA... 20 mA
2: 20 mA... 0 mA
3: 4 mA... 20 mA
4: 20mA... 4 mA
Digital, incremental and fieldbus interface on request

Electrical connection
101: 8-pin round connector IEC130-9
102: 8-pin round connector M 12x1
103: 6-pin round connector IEC130-9
201: NT standard cable 1 m
203: NT standard cable 3 m
205: NT standard cable 5 m
Other cable lengths and assembled connectors on request

T	H	1	–	0	8	0	0	–	1	0	2	–	4	1	1	–	1	0	2

Series

Electrical measuring range
Standard lengths
0050 up to 4250 mm

Mechanical version
102: Screw flange M 18x1.5 zero point at 30 mm
104: Screw flange M 18x1,5 zero point at 51 mm
106: like 102, but with female thread M4x6 at the rod end and additional length 7.5 mm
108: like 104, but with female thread M4x6 at the rod end and additional length 7.5 mm
Other mechanical configurations e.g. screw flange 3/4“ 16UNF on request

Required accessories	Ring position marker				
	Z-TH1-P18, P/N 005697				
	Z-TH1-P19, P/N 005698				
	Z-TIM-P20, P/N 005699. Other position marker on request.				
Recommended accessories	**Mating female connector straight, IEC 130-9**	**Mating female connector angled, IEC130-9**	**Cable set - female connector 12x1, 8-pin, straight, with molded PUR-cable, shielded, 8x0,25 mm², IP67, open-ended**	**Cable set - female connector 12x1, 8-pin, angled, with molded PUR-cable, shielded, 8x0,25 mm², IP67, open-ended**	**Mounting nut M18x1,5-A2**
	8-pin, EEM 33-84, P/N 005627	8-pin, EEM 33-85, P/N 005628	2 m length, EEM 33-86, P/N 005629	2 m length, EEM 33-87, P/N 005630	Z-TH1-M01, P/N 056090
	6-pin, EEM 33-82, P/N 005639	6-pin, EEM 33-94, P/N 005648	5 m length, EEM 33-90, P/N 005635	5 m length, EEM 33-91, P/N 005636	
			10 m length, EEM 33-92, P/N 005637	10 m length, EEM 33-93, P/N 005638	

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