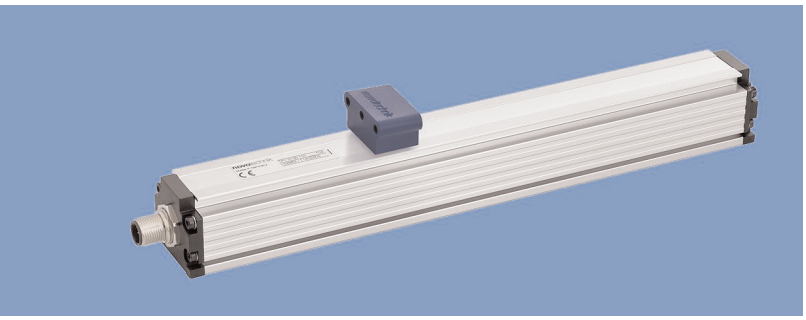
novotechnik
Siedle Group

NOVOSTRICTIVE Transducer up to 4250 mm touchless absolute

Series TP1 with incremental Quadrature interface



Special features

- absolute transducer in robust profile design
- NOVOSTRICTIVE non-contacting magnetostrictive measurement principle
- non-contact position detection
- wear-free, unlimited mechanical life span
- incremental quadrature interface
- Power-On Burst with absolut position information
- excellent linearity up to 10 µm
- resolution up to 0.001 mm regardless of stroke length
- low temperature coefficient <15 ppm/K
- insensitive to shock and vibration
- cable or connector version available
- protection class IP67 / IP68

Position transducer with NOVOSTRICTIVE non-contacting magnetostrictive measurement principle for direct, accurate measurement of travel in display- or feedback applications.
The measurement with floating position marker takes place contactless and therefore wear-free.

The passive position marker (magnet) is optionally as floating or guided design available.
The fixing via mounting clamps allows a very simple, flexible mounting and a precise adjustment of the installation position.

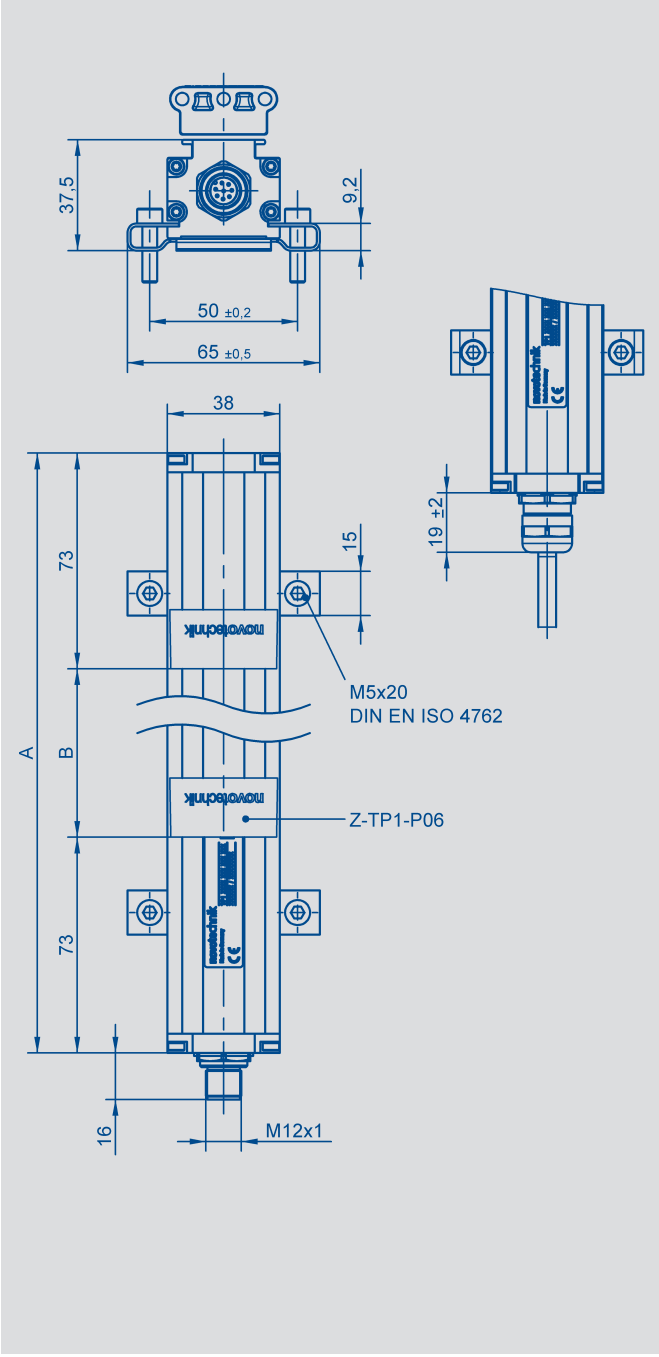
The aluminium housing was designed in such a way, that a closed tight construction form with reduced installation dimensions could be realized.
The transducer is insensitive to soilings such as dust, humidity or oils.
The high mechanical robustness of the transducer in combination with the measurement principle enables measuring stroke lengths up to 4250 mm.

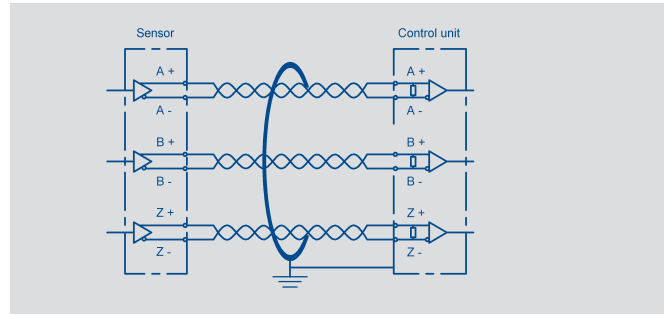
The transducer with incremental output can directly connected to usual standard encoder input devices for quadratur alternatively four-fold-processing.

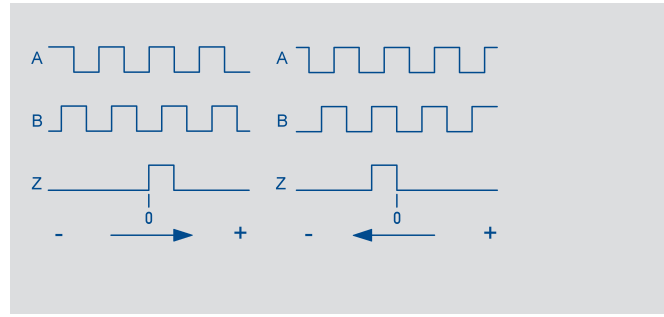
The integrated advanced ASIC electronics provides two of 90 degrees phase displaced A and B pulse and additional a reference Z pulse. For a safe data communication the signal transmission takes place via RS422.
Also an exceeding of the maximum velocity, does not lead to a loss of increments, after fall below of this velocity, the complement of increments will be available on the output. Therefore no static position failure will happen.
By the initialization phase after Power-On, the absolute position value will be available on the signal unit, hereby a reference drive (Power-On-Burst) is not required.

Additional interfaces see separate data sheet.

Description	
Housing	Aluminium, anodized, metal end flanges
Mounting	adjustable clamps
Position marker	floating position marker, plastic guided position marker, ball coupling
Measuring principle	NOVOSTRICTIVE touchless magnetostrictive
Electrical connections	8-pin round connector, shielded, M12 x 1 8-wire PUR / PVC-cable, 8 x 0.25 mm², shielded: 1 m, 5 m or 10 m length
Electronic	SMD with ASIC, integrated Connector casing resp. shield is connected with the sensor housing, housing is capacitive decoupled to the electronic





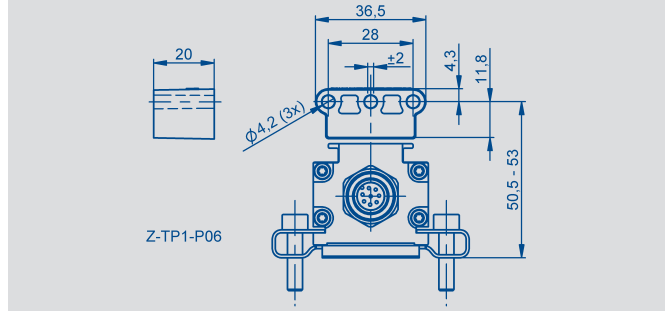


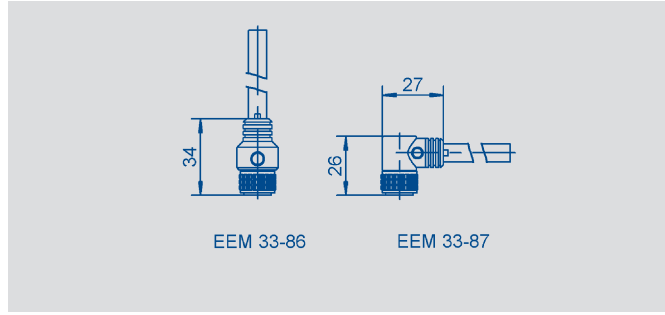
Output connector Code 102	Cable Code 201, 203, 205	Connector with cable signal EEM33-86, EEM33-87	
PIN 1	YE	WH	A+
PIN 2	GY	BN	B+
PIN 3	GN	GN	B-
PIN 4	WH	YE	Z+
PIN 5	RD	GY	Z-
PIN 6	BU	PK	supply GND
PIN 7	BN	BU	+24 VDC
PIN 8	PK	RD	A-

Quadrature interface		
Transmission standard for A/B/Z	RS422 differential / incremental	
Max. pulse frequency power on (initialization)		
High speed mode	156	kHz
Low speed mode (standard)	78	kHz
Max. operating speed		
High speed mode	2,2	m/s
Low speed mode (standard)	1,1	m/s
Frequency A/B- signal	variable, depending on operating speed	
Missing increments at overstep of max. operating speed	no	
Length Z- pulse	1 increment	

Type designations	TP1 - _ _ _ _ - 101 - 8 _ _ - _ _ _ Incremental Quadrature interface	
Electrical Data		
Electrical measuring range (dimension B)	0050 up to 4250	
Absolute linearity	≤ ± 10 µm** up to 1000 mm ≤ ± 25 µm** up to 2500 mm ≤ ± 40 µm** up to 4250 mm	
Tolerance of electr. zero point	± 0.5	mm
Output signal	RS422 differential / incremental	
Resolution (4 times interpretation)	1 or 5	µm
Reproducibility	≤ 6	µm
Hysteresis	≤ 4	µm
Supply voltage	24 (13...34)	VDC
Supply voltage ripple	≤ 10	%Vss
Current consumption	≤ 100	mA
Temperature coefficient	≤ 15 (min. 0.01 mm/K)	ppm/K
Overvoltage protection	40 (permanent)	VDC
Polarity protection	up to Umax.	
Signal output protection	7 (permanent)	VDC
Insulation resistance (500 VDC)	≥ 10	MΩ
Mechanical Data		
Dimensions	see drawing	
Body length (dimension A)	dimension B + 146	± 2 mm
Environmental Data		
Operating temperature range	-40...+85	°C
Storage temperature range	-40...+105	°C
Operating humidity range	0...95 (no condensation)	%R.H.
MTTF (ISO 13849-1, parts count method, w/o load)	27	years
Shock per DIN IEC68T2-27	100 (11 ms) (single hit)	g
Vibration per DIN IEC68T2-6	20 (10...2000 Hz, A_{max}=0.75 mm)	
Protection class per DIN EN 60529	IP67 with fastened connector IP68 with cable connection	

**) Measured with 1 micron resolution. With a higher resolution, the permissible linearity error is increased by the resolution.





Mechanical data when used with floating position marker		
Max. traverse speed with valid ouput signal	2.2 resp. 1.1	ms^{-1}
Max. traverse acceleration with valid ouput signal	200	ms^{-2}
Life	mechanically unlimited	
Standard measuring range	50, 75,100, 125, 150, 175,	mm
(dimension B)	200, 225, 250, 275, 300, 325, 350, 375, 400, 425, 450, 475, 500, 550, 600, 650, 700, 750, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1700, 1800, 1900, 2000, 2250, 2500, 2750, 3000, 3250, 3500, 2750, 4000, 4250 Other lengths on request.	
CE-Conformity		
Emission	RF noise field strength EN 55011 class B	
Noise immunity	ESD EN 61000-4-2 Radiated immunity EN 61000-4-3 Burst EN 61000-4-4 Conducted disturbances induced by RF fields EN 61000-4-6	

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Ordering specifications

Preferred types printed in bold

Mech. version
101: Profile design

Electrical interface
8: Incremental Quadrature interface

Output signal incremental interface 8 _ _
4: Resolution 5 µm, variable frequency, high speed mode, power-on burst
6: Resolution 1 µm, variable frequency, high speed mode, power-on burst
7: Resolution 5 µm, variable frequency, low speed mode, power-on burst
9: Resolution 1 µm, variable frequnecy, low speed mode, power-on burst

Incremental interface 8 _ _
1: RS422 differential (A+ A- B+ B- Z+ Z-)

Electrical connection
102: 8-pin round connector M12x1
201: NT standard cable 1 m
203: NT standard cable 3 m
205: NT standard cable 5 m

T	P	1	-	0	8	0	0	-	1	0	1	-	8	4	1	-	1	0	2

Electrical measuring range
Standard lengths 0050 up to 4250 mm
0050 up to 0500 mm in 25 mm-steps, 0500 up to 1000 mm in 50 mm-steps,
1000 up to 2000 mm in 100 mm-steps, 2000 up to 4250 mm in 250 mm-steps.
Other lengths on request.

Series

Included in delivery
Mounting clamps Z46 electr. isolating incl. cylinder screws

Required accessories
Floating position marker Z-TP1-P06, Art.No. 005693, Z-TP1-P07, Art.No. 005694; Guided position marker Z-TP1-P08, Art.No. 005695; Other position marker on request.

Recommended accessories
PUR-cable with 8-pin female connector M12 x 1, 8 x 0.25 mm^2, shielded:
2 m length, EEM 33-86,
5 m length, EEM 33-90,
10 m length, EEM 33-92;
PUR-cable with 8-pin female angled connector, M12 x 1, 8 x 0.25 mm^2, shielded:
2 m length, EEM 33-87,
5 m length, EEM 33-91,
10 m length, EEM 33-93.
Actuating rods Z-TP1-S01... for position marker Z-TP1-P08.

Available on request
Standard cable 10 m
Specific connectors
Other resolutions
Burst on demand
Z-pulse Teach-In
Analog, digitale and fieldbus interfaces
(see separate data sheets).

Important
Avoid equalizing currents in the cable shield caused by potential differences. Twisted pair cable is recommended.