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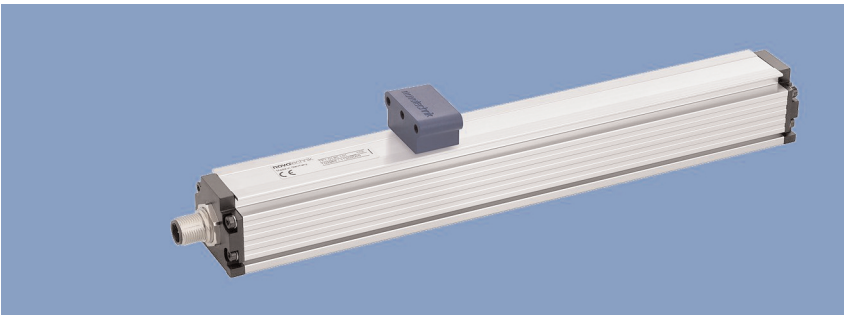
NOVOSTRICTIVE Transducer up to 4500 mm Touchless Absolute

Series TP1 with Incremental Quadrature Interface



Special features

- Absolute transducer in robust profile design
- NOVOSTRICTIVE, touch-less magnetostrictive measuring process
- Position detection without contact
- Wear-free, unlimited mechanical life
- Incremental quadrature interface
- Power-On burst with absolute position information
- Excellent linearity to 10 µm
- Resolution 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

TP 1 Transducers employ the NOVOSTRICTIVE touchless magnetostrictive measuring process for direct, precise and absolute measurement of linear position in motion control, positioning and measurement display applications.

This measurement principle uses position markers (magnets) as mechanical input devices. The position markers are available in free-floating or rail-guided versions.

Clamps allow easy and flexible mounting as well as precise adjustment of the installation position.

The transducer is mechanically very robust, and due to the the magnetostrictive measurement technology resistant to high shock and vibration.

The active sensing element is encased in an aluminum housing rated to IP 68. This makes for excellent ingression protection from dust, moisture and oils.

The transducer's incremental output can be directly connected to standard encoder input devices for quadrature or four-fold processing.

A sophisticated ASIC in the transducer provides two 90 degree phase shifted pulses (A and B) as well as a reference pulse (Z). The signal output conforms to the RS422 data transmission standard.

Another feature is that exceeding the valid signal range from the marker's traverse velocity does not lead to a loss of increments. After the marker's speed falls below the maximum velocity, the complement of increments is available at the output so no offset error occurs.

After Power-On, the unit transmits the absolute position value (Power-On Burst), therefore it is not necessary to move the marker to a reference position.

Additional interfaces are available - see separate data sheets.

Description	
Housing	Aluminum, 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: 2 m, 5 m or 10 m length
Electronic	SMD with integrated ASIC Connector casing (shield) is connected with the sensor housing, housing is capacitively decoupled from the electronics

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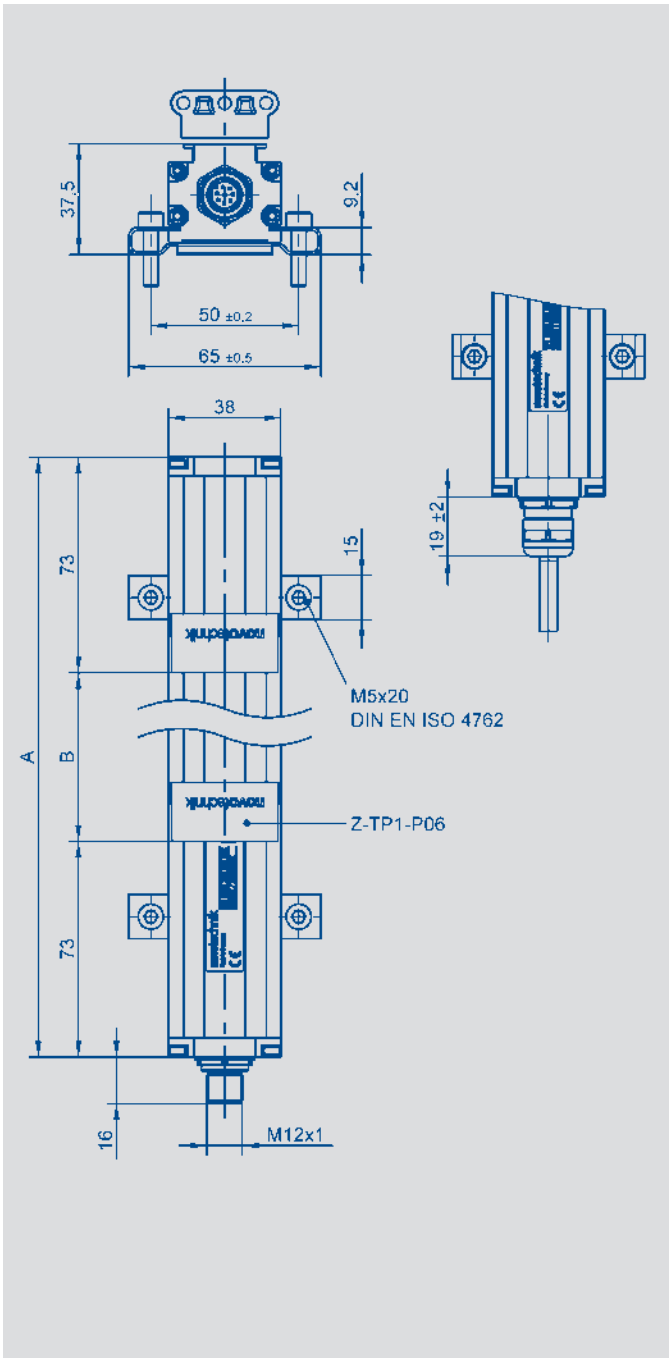

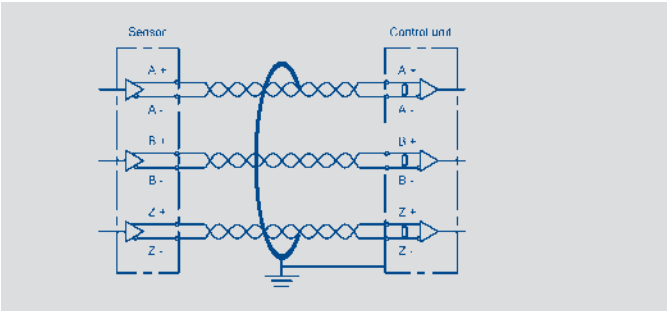

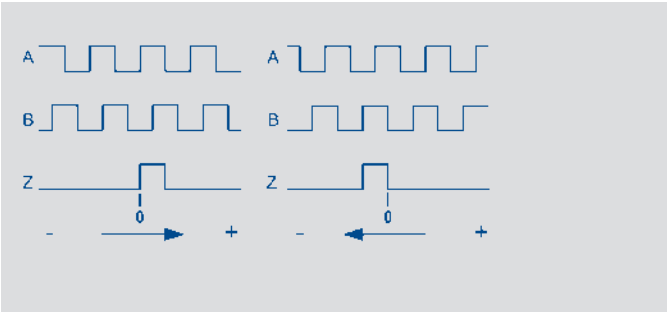

Output connector Code 102	Cable Code 201, 203, 205	Connector with cable signal EEM33-86, EEM33-87	
PIN 1	YE	WH	A+
PIN 2	GY	BN	B+
PIN 3	GN	GN	B-
PIN 4	WH	YE	Z+
PIN 5	RD	GY	Z-
PIN 6	BU	PK	supply GND
PIN 7	BN	BU	+24 VDC
PIN 8	PK	RD	A-

Quadrature interface		
Transmission standard for A/B/Z	RS422 differential	
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	

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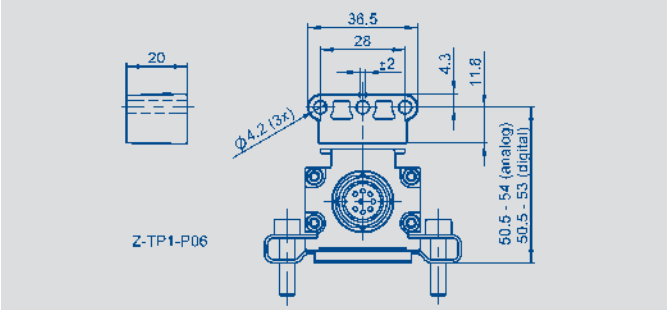
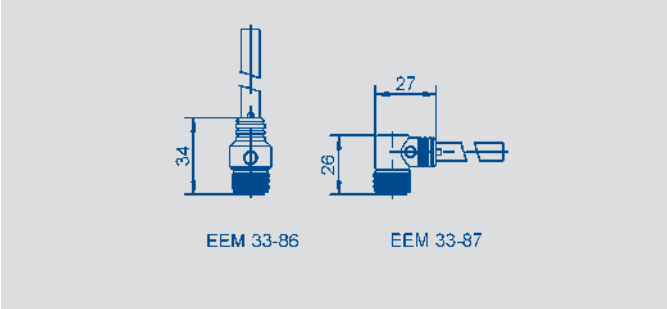
Type designations	TP1 - _ _ _ _ - 101 - 8 _ _ - _ _ _ Incremental Quadrature interface	
Electrical Data		
Electrical measuring range (dimension B)	0050 up to 4500	
Absolute linearity	≤ ± 10 µm up to 1000 mm ≤ ± 25 µm up to 2500 mm ≤ ± 40 µm up to 4500 mm	
Tolerance of electr. zero point	± 0.5	mm
Output signal	RS422 incremental	
Resolution (4 times interpretation)	1 or 5	µm
Repeatability	≤ 6	µm
Hysteresis	≤ 4	µm
Supply voltage	24 (13...34)	VDC
Supply voltage ripple	≤ 10	%Vss
Current consumption	≤ 100	mA
Temperature coefficient	≤ 15	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.
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	





Mechanical data when used with floating position marker		
Max. traverse speed with valid ouput signal	2.2	ms^{-1}
Max. traverse acceleration with valid ouput signal	200	ms^{-2}
Life	unlimited (mechanical)	movements
Standard measuring range (dimension B)	50, 75,100, 125, 150, 175, 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, 4500 Other lengths on request.	mm
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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Art.-No.: 062 722
Subject to changes

Ordering specifications

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

Series

Electrical measuring range
Standard lengths 0050 up to 4500 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 4500 mm in 250 mm-steps.
Other lengths on request.

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.

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

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