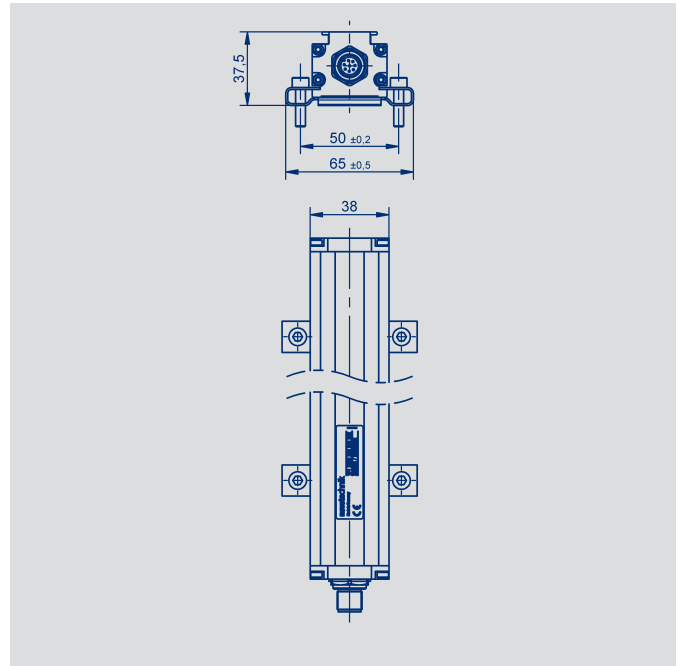
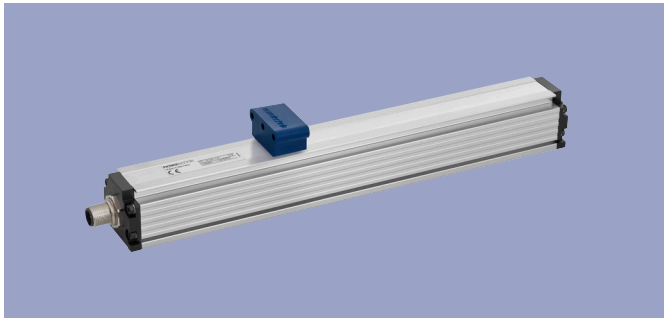


**NOVOSTRICTIVE**  
**Transducer**  
**up to 4250 mm**  
**touchless**

Series TP1



**Special features**

- Non-contacting magnetostrictive measurement technology
- Touchless position detection
- Wear-free, unlimited mechanical life
- Resolution up to 1 µm, independently of length
- Low temperature coefficient <15 ppm/K
- Insensitive to shock and vibration
- Protection class IP67 / IP68
- Position-Teach-In
- Optionally galvanic isolated
- Interfaces: Analog, SSI, Impulse, Incremental, CANopen

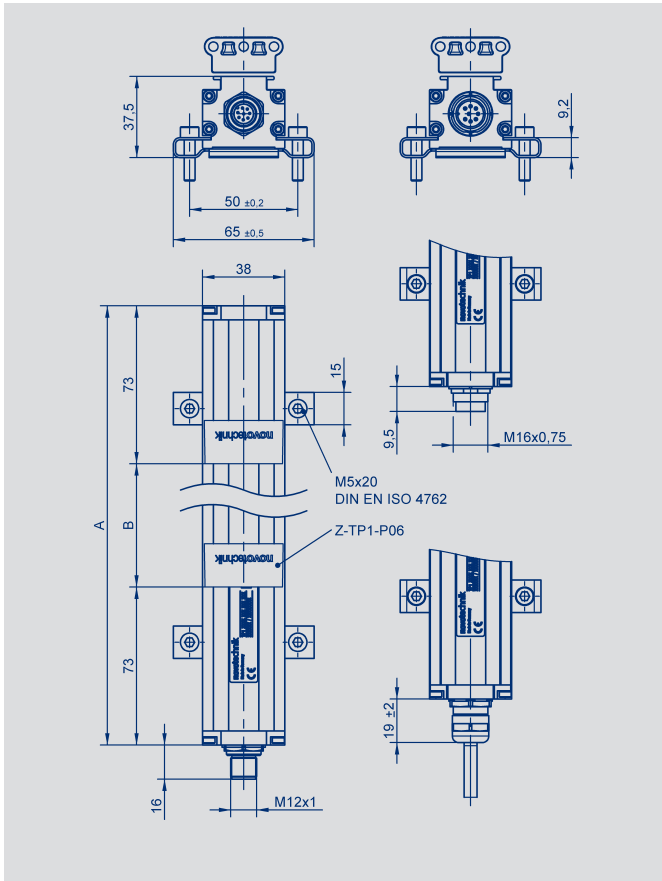
**Applications**

- Manufacturing Engineering
  - Plastic injection molding
  - Textile
  - Packaging
  - Sheet metal working
  - Woodwork
- Automation Technology

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## Mechanical Data



Description	
Housing	Aluminium, anodized, metal end flanges
Mounting	Adjustable clamps
Position marker	Floating position marker, plastic Guided position marker, plastic, ball coupling
Electrical connections	Connector M12x1, 5-pin / 8-pin, shielded Connector M16x0,75 (IEC 130-9), 6-pin / 8-pin, shielded PUR-cable, 8 x 0,25 mm <sup>2</sup> , shielded: 1 m, 3 m oder 5 m length
Electronic	SMD with ASIC, integrated Connector casing (shield) is connected to the sensor housing. Housing is capacitively decoupled to the electronics

Mechanical Data		
Dimensions	see dimension drawing	
Length of housing (dimension A)	Dimension B + 146	mm
Electrical measuring range (dimension B)	0050 up to 0500 mm in 25 mm steps, 500 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.	
Max. operational speed with valid output signal	10	ms <sup>-1</sup>
Max. operational acceleration with valid output signal	200	ms <sup>-2</sup>
Shock (IEC 60068-2-27)	100 (11 ms) (single hit)	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	
Life	Mechanically unlimited (with floating position marker)	
Operating temperature range	-40 ... +85	°C
Storage temperature range	-40 ... +105	°C
Operating humidity range	0 ... 95 (no condensation)	% R.H.

## Technical Data Analog Versions

Type designations	TP1-____-101 - 41 _ - ____ Voltage	TP1-____-101 - 42 _ - ____ Current	
<b>Electrical Data</b>			
Electrical measuring range (dimension B)	0050 up to 4250		mm
Output signal	0,1 ... 10 V (load $\geq$ 5 k $\Omega$ ) -10 ... 10 V (load $\geq$ 5 k $\Omega$ )	0,1 ... 20 mA (burden $\leq$ 500 $\Omega$ ) 4 ... 20 mA (burden $\leq$ 500 $\Omega$ )	
Number of channels	2	1	
Update rate *	$\leq$ 16		kHz
Resolution	16		bit
Absolute linearity	$\leq \pm 0,02$ (min. $\pm 50 \mu\text{m}$ ) **		% FS
Tolerance of electr. zero point	$\pm 0,5$ (min. 2 x reproducibility)		mm
Reproducibility	$\leq 0,03$		% FS
Hysteresis	$\leq 0,01$		% FS
Temperature error	$\leq 30$ (min. 0,01 mm/K)		ppm/K
Supply voltage	24 (19 ... 30)		VDC
Supply voltage with galvanic isolation	24 (18 ... 36)		VDC
Supply voltage ripple	$\leq 10$		% V <sub>ss</sub>
Current consumption	$\leq 100$		mA
Overvoltage protection	40 (temporary / 1 min.)		VDC
Polarity protection	Yes, up to supply voltage U <sub>b</sub> max		VDC
Short circuit protection	Yes (outputs vs.GND and supply voltage U <sub>b</sub> max.)		
Insulation resistance (500 VDC)	$\geq 10$		M $\Omega$
<b>Environmental Data</b>			
MTTF (DIN EN ISO 13849-1 parts count method, w/o load, wc)	23		Years
Functional safety	If you need assistance in using our products in safety-related systems, please contact us		
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) 2 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 55011 Radiated disturbances class B		

\*) Data are extrapolated, internal measuring rate depends on length.

\*\*) Valid for channel 1; channel 2 with additional offset and gradient tolerances (inverted signal from channel 1).  
Measured with position marker Z-TP1-P06.



### Pin assignment

Output connector code 101, 102	Cable code 20_	Connector with cable (Accessories)	Analog voltage	Analog current
PIN 1	YE	WH	do not connect	0(4)...20 mA
PIN 2	GY	BN	Signal GND	Signal GND
PIN 3	PK	GN	+10...0 (-10) V	do not connect
PIN 4	RD	YE	DIAG *	DIAG *
PIN 5	GN	GY	0 (-10)...+10 V	do not connect
PIN 6	BU	PK	GND	GND
PIN 7	BN	BU	Supply voltage U <sub>b</sub>	Supply voltage U <sub>b</sub>
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)...+10 V	0 (4)...20 mA
PIN 2	Signal GND	Signal GND
PIN 3	+10...0 (-10) V	do not connect
PIN 4	GND	GND
PIN 5	Supply voltage U <sub>b</sub>	Supply voltage U <sub>b</sub>
PIN 6	GND	GND

**Ordering Specifications  
Analog Versions  
- Voltage  
- Current**

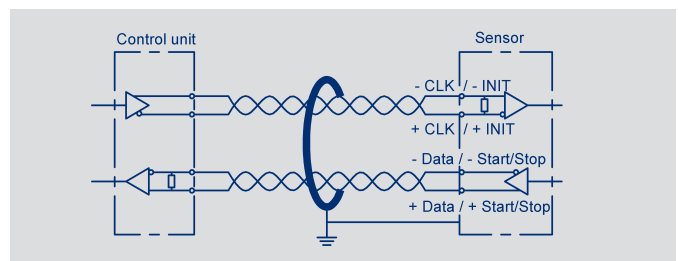
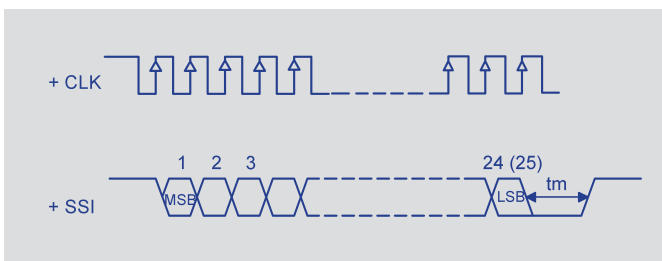
<p><b>Ordering specifications</b></p> <p>Preferred types printed in bold</p>	<p>Mechanical version <b>101: Profile design</b></p>	<p>Electrical interface <b>4: Analog interface</b></p>	<p>Output signal analog interfaces 4 _ _ <b>1: Voltage output</b> <b>2: Current output</b></p>	<p>Output signal analog interfaces 4 _ _</p> <p><b>1: Voltage output</b> <b>2: Current output</b></p> <p><b>Analog interface voltage output 41_</b> 1: 0 ... <b>10 V</b> und 10 ... 0 V * 4: 0 ... 10 V und 10 ... 0 V galvanic isolated 6: -10 ... +10 V und +10 ... -10 V galvanic isolated</p> <p><b>Analog interface current output 42_</b> 1: 0 ... 20 mA * 2: 20 ... 0 mA * <b>3: 4 ... 20 mA *</b> 4: 20 ... 4 mA *</p> <p>*) With Teach-In-function</p> <p><b>Electrical connection</b> 101: Connector M16x0,75 (IEC 130-9), 8-pin <b>102: Connector M12x1, 8-pin</b> 103: Connector M16x0,75 (IEC 130-9), 6-pin <b>201: Cable, 8-pole, shielded, 1 m</b> 203: Cable, 8-pole, shielded, 3 m 205: Cable, 8-pole, shielded, 5 m</p>
<p><b>T P 1 - 0 8 0 0 - 1 0 1 - 4 1 1 - 1 0 2</b></p>				
<p>Series</p>	<p>Electrical measuring range <b>Standard lengths 0050 up to 4250 mm</b> 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</p>			

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

## Technical Data SSI-Interface

<b>Type designations</b>	<b>TP1 - _ _ _ _ - 101 - 2 _ _ _ _</b> <b>Synchronous-serial interface (SSI)</b>	
<b>Electrical Data</b>		
Electrical measuring range (dimension B)	0050 up to 4250	mm
Protocol	SSI 24 und 25 bit (26 bit on request)	
Inputs	RS422	
Monoflop time (tm)	30	µs
Encoding	Gray, Binary	
Update rate *	16	kHz
Resolution	1, 5 or 10 see ordering specifications (other resolutions on request)	
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
Reproducibility	≤ 6	µm
Hysteresis	≤ 4	µm
Temperature error	≤ 15 (min. 0.01 mm/K)	ppm/K
Supply voltage Ub	24 (13 ... 34)	
Supply voltage ripple	≤ 10	% Vss
Overvoltage protection	40 (permanent)	
Current consumption	≤ 100	mA
Polarity protection	Yes, up to supply voltage Ub max.	
Short circuit protection	Yes (outputs vs. GND and supply voltage Ub up to 7 V)	
Ohmic load at outputs	> 120	Ω
Max. clock rate	2	MHz
Insulation resistance (500 VDC)	≥ 10	MΩ
<b>Environmental Data</b>		
MTTF (DIN EN ISO 13849-1, parts count method, w/o load, wc)	27	Years
Functional safety	If you need assistance in using our products in safety-related systems, please contact us	
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) 2 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 55011 Radiated disturbances class B	

\*) Data are extrapolated, internal measuring rate depends on length.  
\*\*) Measured with resolution 1 µm.  
At higher resolution, the permissible linearity error is increased by the resolution.



### Pin assignment

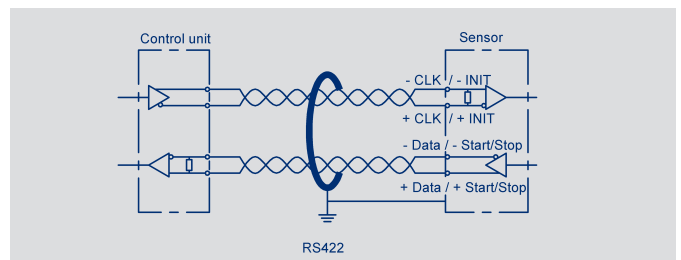
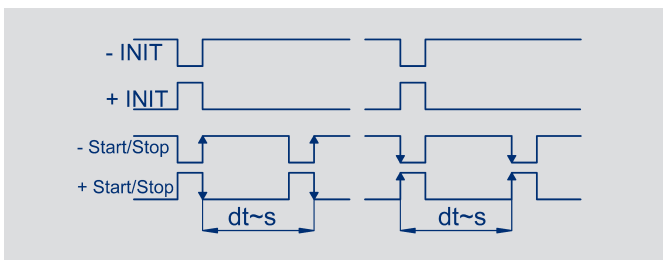
Output connector code 101, 102	Cable code 20 _	Connector with cable (Accessories)	SSI-Interface
PIN 1	YE	WH	Clk +
PIN 2	GY	BN	Data +
PIN 3	PK	GN	Clk -
PIN 4	RD	YE	do not connect
PIN 5	GN	GY	Data -
PIN 6	BU	PK	GND
PIN 7	BN	BU	Supply voltage Ub
PIN 8	WH	RD	do not connect

Output connector code 103	SSI-Interface
Pin 1	Data -
Pin 2	Data +
Pin 3	Clk +
Pin 4	Clk -
Pin 5	Supply voltage Ub
Pin 6	GND

## Technical Data Impulse-Interface

<b>Type designations</b>	<b>TP1- _ _ _ _ - 101 - 11 _ - _ _ _</b> <b>Start-Stop-Impulse-Interface</b>	
<b>Electrical Data</b>		
Electrical measuring range (dimension B)	0050 up to 4250	mm
Protocol	Impulse	
Inputs	RS422	
Update rate *	0.25 ... 1	kHz
Resolution	Depending on interpretation, normalized to 2800 ms <sup>-1</sup>	
Absolute linearity	≤ ± 50	µm
Tolerance of electr. zero point	± 0.5	mm
Reproducibility	≤ 6	µm
Hysteresis	≤ 4	µm
Temperature error	≤ 15 (min. 0,01 mm/K)	ppm/K
Supply voltage Ub	24 (13 ... 34)	VDC
Supply voltage ripple	≤ 10	% Vss
Overvoltage protection	40 (permanent)	VDC
Current consumption	≤ 100	mA
Polarity protection	Yes, up to supply voltage Ub max.	
Short circuit protection	Yes (outputs vs. GND and supply voltage Ub up to 7 V)	
Insulation resistance (500 VDC)	≥ 10	MΩ
<b>Environmental Data</b>		
MTTF (DIN EN ISO 13849-1, parts count method, w/o load, wc)	27	Years
Functional safety	If you need assistance in using our products in safety-related systems, please contact us	
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) 2 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 55011 Radiated disturbances class B	

\*) Data are extrapolated, internal measuring rate depends on length.



### Pin assignment

Output connector code 101, 102	Cable code 20 _	Connector with cable (Accessories)	Start/Stop-Impulse-Interface
PIN 1	YE	WH	INIT +
PIN 2	GY	BN	Start/Stop +
PIN 3	PK	GN	INIT -
PIN 4	RD	YE	do not connect
PIN 5	GN	GY	Start/Stop -
PIN 6	BU	PK	GND
PIN 7	BN	BU	Supply voltage Ub
PIN 8	WH	RD	do not connect

Output connector code 103	Start/Stop-Impulse-Interface
Pin 1	Start/Stop -
Pin 2	Start/Stop +
Pin 3	INIT +
Pin 4	INIT -
Pin 5	Supply voltage Ub
Pin 6	GND

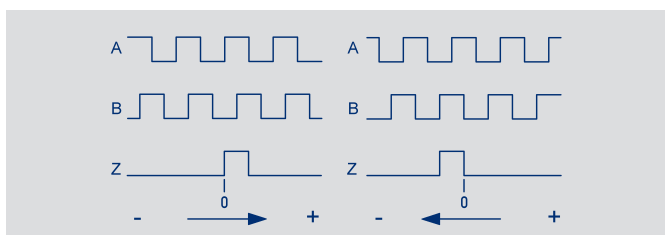
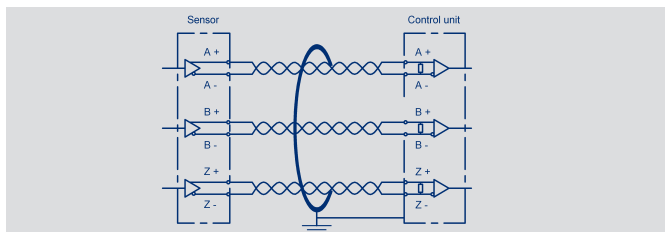
## Technical Data Incremental- Interface

<b>Type designations</b>	<b>TP1- _ _ _ _ - 101 - 8 _ _ _ _</b> <b>Incremental-Interface</b>	
<b>Electrical Data</b>		
Electrical measuring range (dimension B)	0050 up to 4250	mm
Outputs	A+ / A- / B+ / B- / Z+ / Z-	
Level	RS422 differential	
Update rate*	16	kHz
Resolution (with 4-fold interpretation)	1 or 5	µm
Max. pulse frequency at power-on (initialising)	156 high speed mode 78 low speed mode	kHz kHz
Frequency A/B-signal	Variable, depending on operational speed, max. 148	kHz
Missing increments when exceeding the max. operational speed	none	
Length Z-pulse	Distance between 2 edges A / B	
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
Reproducibility	≤ 6	µm
Hysteresis	≤ 4	µm
Temperature error	≤ 15 (min. 0.01 mm/K)	ppm/K
Supply voltage	24 (13 ... 34)	VDC
Supply voltage ripple	≤ 10	% Ub
Current consumption	≤ 100	mA
Overvoltage protection	40 (permanent)	VDC
Polarity protection	Yes, up to supply voltage Ub max.	
Short circuit protection	Yes (outputs vs. GND and supply voltage Ub up to 7 V)	
Ohmic load at outputs	≥ 120	Ω
Insulation resistance (500 VDC)	≥ 10	MΩ
<b>Environmental Data</b>		
Max. operating speed ***	Resolution 1 µm	Resolution 5 µm
High speed mode	0.45	2.2
Low speed mode	0.22	1.1
MTTF (DIN EN ISO 13849-1, parts count method, w/o load, wc)	27	Years
Functional safety	If you need assistance in using our products in safety-related systems, please contact us	
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) 2 kV EN 61000-4-6 Conducted disturbances, induced by RF-fields 10 V eff. EN 55011 Radiated disturbances class B	

\*) Data are extrapolated, internal measuring rate depends on length.

\*\*) Measured with resolution 1 µm. At higher resolution, the permissible linearity error is increased by the resolution.

\*\*\*) With valid output signal, when using a floating position marker.



### Pin assignment

Output connector code 102	Cable code 20 _	Connector with cable (Accessories)	Signal
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	GND
PIN 7	BN	BU	Supply voltage Ub
PIN 8	PK	RD	A-



**Ordering Specifications**  
**Digital Versions**  
**- SSI**  
**- Start-Stop-Impulse**  
**- Incremental**

**Ordering specifications**

Preferred types printed in bold

Mechanical version  
101: Profile design

Electrical Interface

- 1: Impulse-Interface
- 2: SSI-Interface
- 8: Incremental-Interface (A / B / Z)

Output signal Impulse-Interface 1 \_\_  
1: Impulse-Interface Start-Stop Signal

Output signal SSI-Interface 2 \_\_  
1: SSI 24 bit  
2: SSI 25 bit  
7: SSI 26 bit (25 = alarm, 26 = parity even) on request

Output signal Incremental-Interface 8 \_\_  
4: Resolution 5 µm, high speed mode, power-on burst  
6: Resolution 1 µm, high speed mode, power-on burst  
7: Resolution 5 µm, low speed mode, power-on burst  
9: Resolution 1 µm, low speed mode, power-on burst

Impulse-Interface Start-Stop Signal 11\_  
4: For 1 up to 3 position marker variable

Synchronous-Serial Interface 2 \_\_  
1: Binary code; resolution 5 µm  
2: Gray code; resolution 5 µm  
4: Binary code; resolution 1 µm  
5: Gray code; resolution 1 µm  
7: Binary code; resolution 10 µm  
8: Gray code; resolution 10 µm

Incremental-Interface 8 \_\_  
1: RS422 differential (A / B / Z)

Electrical connection

- 101: Connector M16x0,75 (IEC 130-9), 8-pin \*
- 102: Connector M12x1, 8-pin**
- 103: Connector M16x0,75 (IEC 130-9), 6-pin \*
- 201: Cable, 8-pole, shielded, 1 m**
- 203: Cable, 8-pole, shielded, 3 m
- 205: Cable, 8-pole, shielded, 5 m
- \*) not for incremental interface

**T P 1 - 0 8 0 0 - 1 0 1 - 2 1 1 - 1 0 2**

Series

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

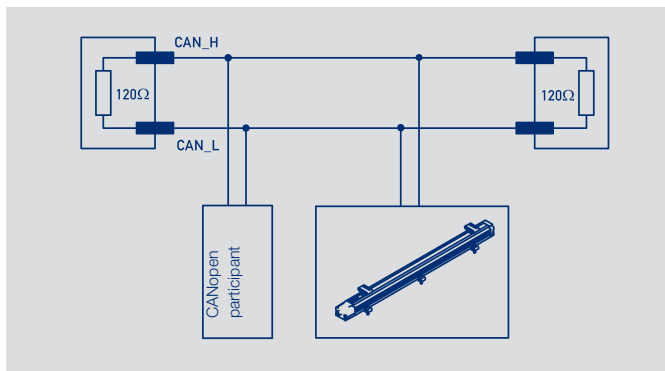
**Important:** Avoid equalizing currents in the cable shield caused by potential differences.  
Twisted pair cable (STP) is recommended.

Technical Data



<b>Type designations</b>	<b>TP1 - _ _ _ -101- 6 _ _ - _ _ _</b> <b>CANopen-Interface</b>	
<b>Electrical Data</b>		
Measured variables	Position and speed	
Electrical measuring range (dimension B)	0050 up to 4250	mm
Measuring range speed	0 ... 10	ms <sup>-1</sup>
Number of position marker	1 / 2 see ordering specifications	
Output signal / protocol	CANopen protocol to CiA DS-301 V4.2.0, Device profile DS-406 V3.2 Encoder class C2, LSS services to CiA DS-305 V1.1.2	
Programmable parameter	Position, speed, cams, working areas, temperature, node-ID, baud rate	
Node-ID	0 ... 127 (default 127)	
Baud rate	10 ... 1000 see ordering specifications	kBaud
Resolution position	1 or 5 see ordering specifications	
Resolution speed	Resolution 1 $\mu$ m 0.1	Resolution 5 $\mu$ m 0.5 mms <sup>-1</sup>
Update rate *	$\leq 16$ kHz	
Absolute linearity	$\leq \pm 10 \mu\text{m}$ up to 1000 mm, $\leq \pm 25 \mu\text{m}$ up to 2500 mm, $\leq \pm 40 \mu\text{m}$ up to 4250 mm **	
Tolerance of electr. zero point	0.5	$\pm$ mm
Reproducibility	$\leq 6$	$\mu$ m
Hysteresis	$\leq 4$	$\mu$ m
Temperature error	$\leq 15$ (min. 0.01 mm/K) ppm/K	
Supply voltage	24 ( 13 ... 34) VDC	
Supply voltage ripple	$\leq 10$ % V <sub>ss</sub>	
Current consumption	$\leq 100$ mA	
Overvoltage protection	40 (permanent) VDC	
Polarity protection	Yes, up to supply voltage U <sub>b</sub> max.	
Short circuit protection	Yes (outputs vs. GND and supply voltage U <sub>b</sub> max.)	
Insulation resistance (500 VDC)	$\geq 10$ M $\Omega$	
Bus termination internal	no	
<b>Environmental Data</b>		
MTTF (DIN EN ISO 13849-1 parts count method, w/o load, wc)	25	Years
Functional safety	If you need assistance in using our products in safety-related systems, please contact us	
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 eff. EN 55016-2-3 Noise radiation class B	

\*) Data are extrapolated, internal measuring rate depends on length.  
\*\*) Measured with resolution 1  $\mu$ m.  
At higher resolution, the permissible linearity error is increased by the resolution.



**Pin assignment**

PIN	Output connector code 105	Output connector code 106
PIN 1	CAN_L	CAN_SHLD *
PIN 2	CAN_H	Supply voltage U <sub>b</sub>
PIN 3	CAN_SHLD	GND
PIN 4	do not connect	CAN_H
PIN 5	Supply voltage U <sub>b</sub>	CAN_L
PIN 6	GND	n/a

\*) CAN\_SHLD: CAN-shield, internally connected to housing

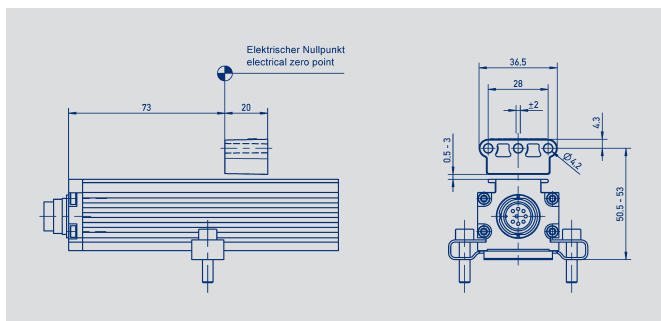
Ordering  
Specifications



<p><b>Ordering specifications</b></p> <p>Preferred types printed in bold</p>	<p>Mechanical version <b>101: Profile design</b></p>	<p>Electrical Interface <b>6: CANopen-Interface</b></p>	<p>Output signal <b>1: 1 x position resolution 5 µm and 1 x speed resolution 0.5 mms<sup>-1</sup> (1 position marker fix)</b> 3: 1 x position resolution 1 µm and 1 x speed resolution 0.1 mms<sup>-1</sup> (1 position marker fix) 5: 2 x position resolution 5 µm and 2 x speed resolution 0.5 mms<sup>-1</sup> (2 position marker fix) 6: 2 x position resolution 1 µm and 2 x speed resolution 0.1 mms<sup>-1</sup> (2 position marker fix)</p>	<p>Baudrate 1: Baud rate 1000 kBaud 2: Baud rate 800 kBaud <b>3: Baud rate 500 kBaud</b> 4: Baud rate 250 kBaud 5: Baud rate 125 kBaud 7: Baud rate 50 kBaud 8: Baud rate 20 kBaud 9: Baud rate 10 kBaud</p>	<p>Electrical Connection 105: Connector M16x0,75 (IEC130-9), 6-pin <b>106: Connector M12x1, 5-pin</b></p>
<p><b>T P 1 - 0 8 0 0 - 1 0 1 - 6 1 3 - 1 0 6</b></p>					
<p>Series</p>	<p>Electrical measuring range <b>Standard lengths von 0050 up to 4250 mm</b> 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</p>				

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

## Position Marker

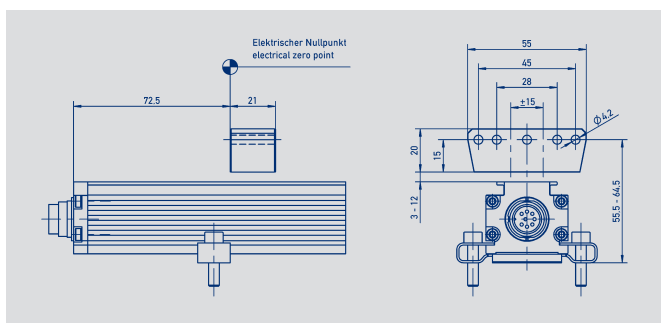
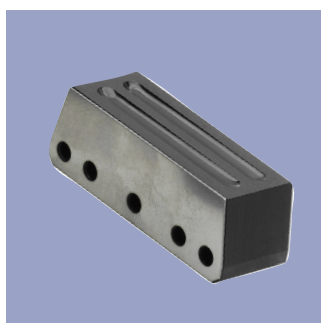


### Floating position marker

Working distance 0,5 ... 3 mm

Weight approx. 10 g

P/N 005693, Z-TP1-P06

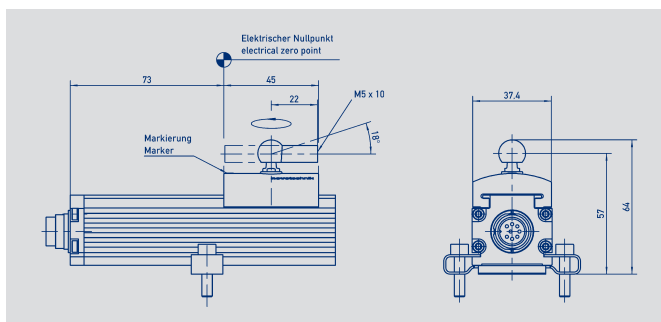


### Floating position marker for large distances

Working distance 3 ... 12 mm

Weight approx. 40 g

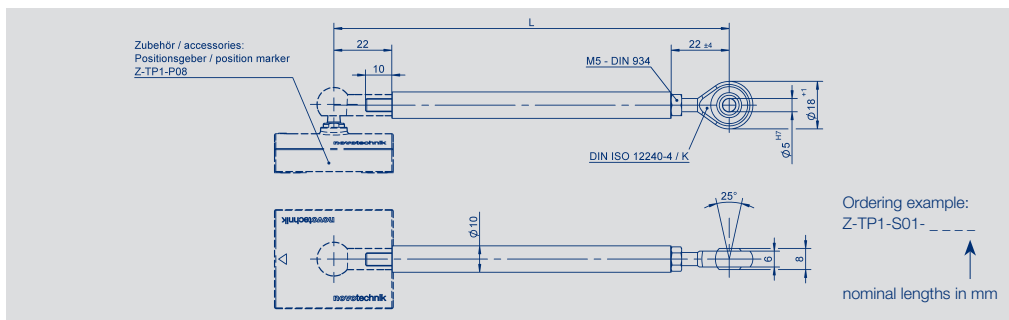
P/N 005694, Z-TP1-P07



### Guided position marker

Weight approx. 30 g

P/N 005695, Z-TP1-P08



### Actuating rod for guided position marker Z-TP1-P08

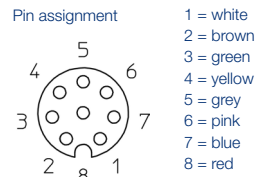
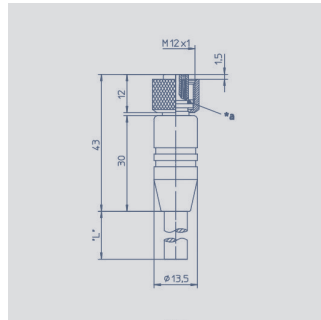
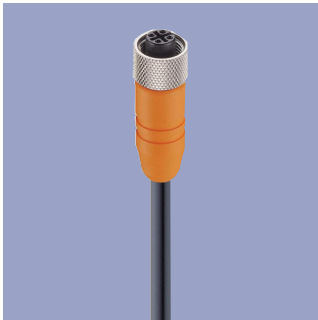
Material Aluminum

Weight approx. 150 g

Standard-nominal lengths (mm)  
0075, 0100, 0125, 0150,  
0200, 0250, 0300, 0350,  
0400, 0450, 0500, 0600,  
0800, 1000, 1500, 2000

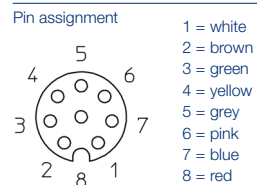
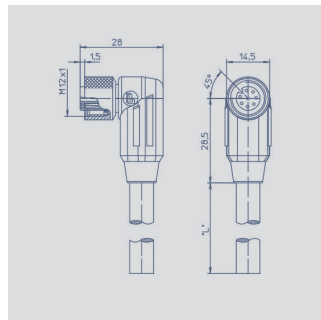
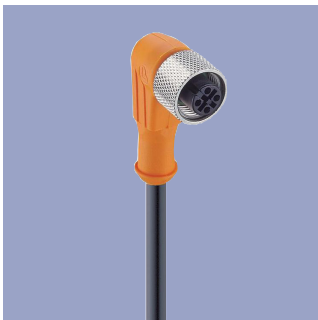
Z-TP1-S01- \_\_\_\_\_

## Connector System M12



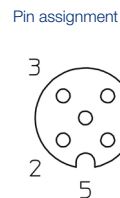
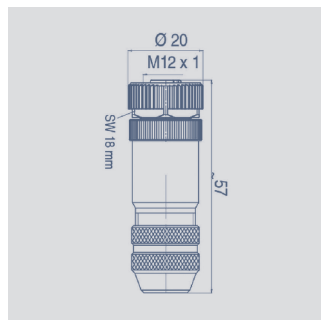
**M12x1 Mating female connector 8-pin., straight, A-coded, with molded cable, unshielded, IP67, open ended**

Connector housing	Plastic PA	
Cable sheath	PUR; Ø = max. 8 mm -25 °C...+80 °C (moved) -50 °C...+80 °C (fixed)	
Wires	PP, 0.25 mm <sup>2</sup>	
<b>Length</b>	<b>Type</b>	<b>P/N</b>
2 m	EEM 33-86	005629
5 m	EEM 33-90	005635
10 m	EEM 33-92	005637



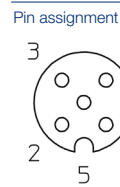
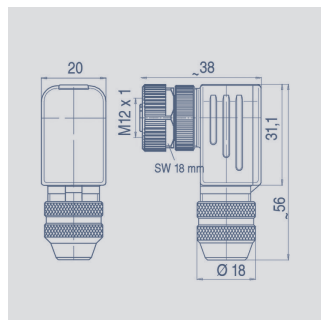
**M12x1 Mating female connector 8-pin., angled, A-coded, with molded cable, shielded, IP67, open ended**

Connector housing	Plastic PA	
Cable sheath	PUR; Ø = max. 8 mm, -25 °C...+80 °C (moved) -50 °C...+80 °C (fixed)	
Wires	PP, 0.25 mm <sup>2</sup>	
<b>Length</b>	<b>Type</b>	<b>P/N</b>
2 m	EEM 33-87	005630
5 m	EEM 33-91	005636
10 m	EEM 33-93	005638



**M12x1 Mating female connector 5-pin., straight, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN-bus**

Connector housing	Metal -40 °C...+85 °C	
For wire gauge	6...8 mm, max. 0.75 mm <sup>2</sup>	
Type	EEM 33-73, P/N 005645	

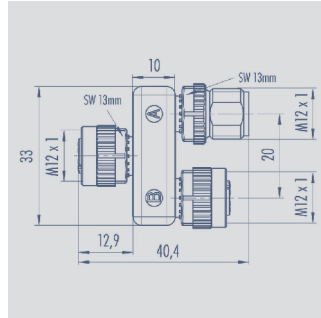


**M12x1 Mating female connector 5-pin., angled, A-coded, with coupling nut, screw termination, IP67, shieldable, CAN-bus**

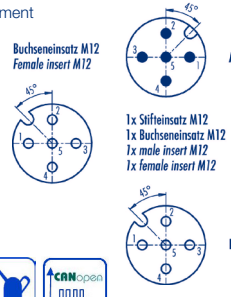
Connector housing	Metal -40 °C...+85 °C	
For wire gauge	6...8 mm, max. 0.75 mm <sup>2</sup>	
Type	EEM 33-75, P/N 005646	

It is possible to turn and fix the contact carrier in 90° positions.

## Connector System M12



### Pin assignment

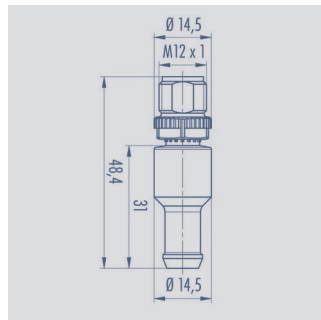


**T-connector M12x1, 5-pin., A-coded, IP68, 1:1 connection, female - male - female, CAN-bus**

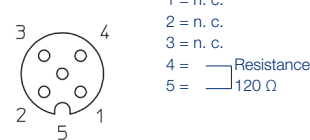
Connector housing PUR

Temperature range -25 °C... +85 °C

Type EEM 33-45, P/N 056145



### Pin assignment

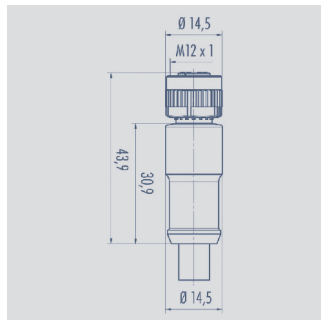


**Terminating resistor M12x1, 5-pin., A-coded, IP67, 120 Ω resistance, CAN-bus**

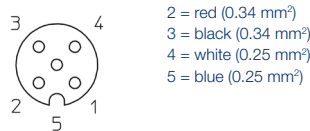
Connector housing PUR

Temperature range -25 °C... +85 °C

Type EEM 33-47, P/N 056147



### Pin assignment



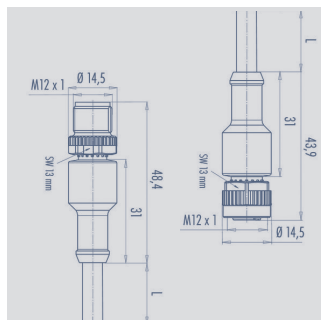
**M12x1 Mating female connector 5-pin., straight, A-coded, with molded cable, IP67, shielded, open ended, CAN-bus**

Connector housing PUR

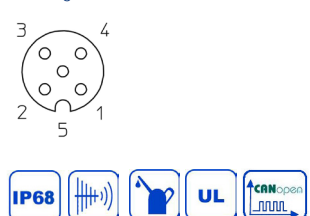
Cable sheath PUR Ø = max. 7.2 mm, -25 °C...+85 °C (moved)

Wires PP 2x 0.25 mm<sup>2</sup> + 2 x 0.34 mm<sup>2</sup>

Length	Type	P/N
2 m	EEM 33-41	056141
5 m	EEM 33-42	056142
10 m	EEM 33-43	056143



### Pin assignment



**M12x1 Mating female connector, 5-pin., straight, A-coded, with molded cable, IP68, shielded, CAN-bus**

Connector housing PUR

Cable sheath PUR; Ø 7.2 mm -25 °C... +85 °C (fixed)

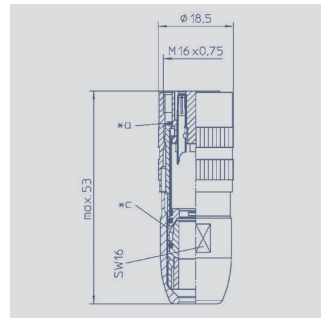
Length	Type	P/N
5 m	EEM 33-44	056144

**Connector System  
M16**

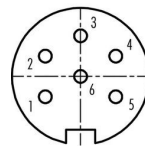
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Pin assignment

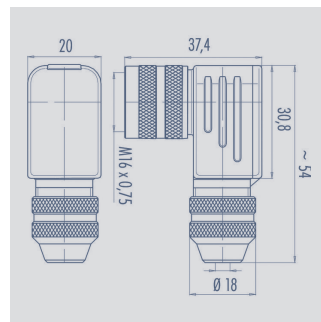


**M16x0,75 Mating female connector  
6-pin., straight, with coupling nut, solder  
terminal, IP68, shielded**

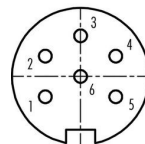
Connector housing CuZn  
(Brass, nickel plated)  
-40 °C... +85 °C

For wire gauge 4...8 mm,  
max. 0.75 mm<sup>2</sup>

Type EEM 33-82, P/N 005639



Pin assignment



**M16x0,75 Mating female connector  
6-pin., angled, with coupling nut, solder  
terminal, IP67, shielded**

Connector housing CuZn  
(Brass, nickel plated)  
-40 °C... +95 °C

For wire gauge 6...8 mm, PG 9  
max. 0.75 mm<sup>2</sup>

Type EEM 33-94, P/N 005648

**IP67** Protection class IP67 to DIN EN 60529

**IP68** Protection class IP68 to DIN EN 60529

**CANopen** CAN-bus

Very good Electromagnetic Compatibility (EMC) and shield systems

Very good resistance to oils, coolants und lubricants

**UL** UL - approved

Suited for applications in dragchains

**Note:** The protection class is valid only in locked position with its plugs.

The application of these products in harsh environments must be checked in particular cases.