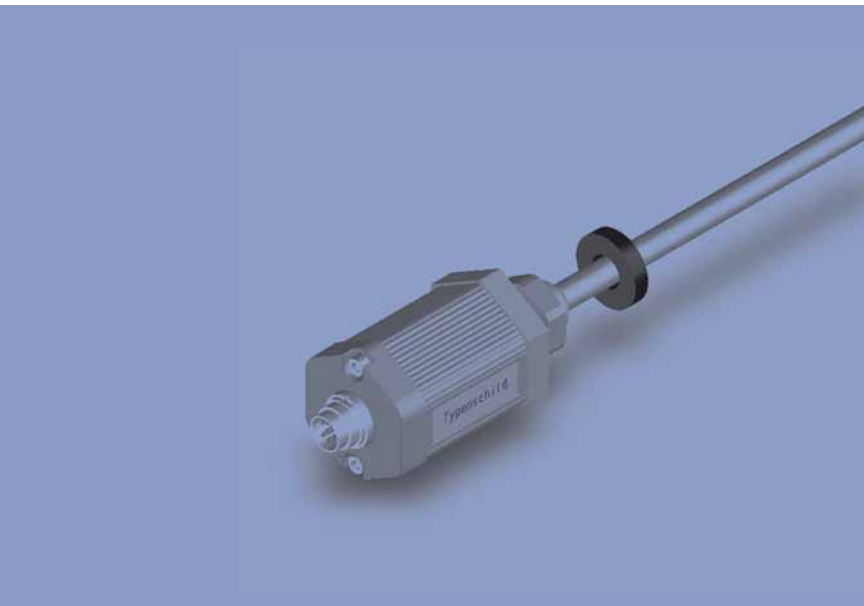




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Transducer up to 4500 mm non-contacting absolute

Series TMI



Special features

- rod style transducer
- non-contact magnetostrictive NOVOSTRICTIVE® measuring process
- high-dynamic serial "DyMoS" interface with data transmission interface
- non-contact guiding with ring-shaped position marker
- unlimited mechanical life
- no velocity limit for position marker
- outstanding linearity performance up to 30 µm
- resolution up to 0.001 mm regardless of stroke length
- low temperature coefficient <20 ppm/K
- insensitive to shock and vibration
- optional cable out or quick disconnect
- operating pressure up to 350 bar

Transducers employing the NOVOSTRICTIVE® non-contact 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 version makes installation even simpler, and the wear-free operation means unlimited mechanical life expectancy and unlimited traverse speed of the position marker.

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. In addition to the familiar interfaces such as the synchronous serial interface (24 or 25 bits) and the Start/Stop pulse interface, a highly dynamic serial "DyMoS" interface with data transfer monitoring is offered.

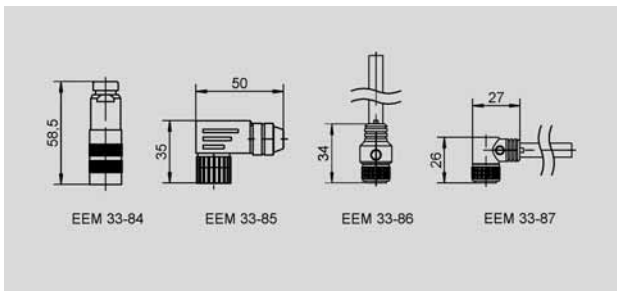
The advantages of conventional interfaces and bus interfaces have been combined in this Novotechnik "DyMoS" interface. In addition to the position value, the "DyMoS" interface also allows the actual traverse velocity to be sent.

The pulse interface also allows fully tolerated processing of both edges of the Start/Stop signal. As an option, the transducer can also be operated with multiple position markers.

Description	
Housing	Anodized aluminium, Rod: stainless steel
Mounting	Bushing M 18 x 1.5
Position marker	Ring position marker, plastic
Measuring technique	Non-contact, magnetostrictive "NOVOSTRICTIVE"
Electrical connection	8-pin round connector, shielded, M12 x 1 8-pin round connector, shielded, IEC130-9 8-conductor cable, shielded, 1 m long
Electronics	Integrated SMD with ASIC Connect cable shield to housing

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Ordering specifications

Electrical Interface

- 1 Standard: Impuls Interface, supply voltage 24 VDC $\pm 20\%$
- 2 Optional: Synchronous Serial Interface, supply voltage 24VDC $\pm 20\%$
- 3 Optional: DyMoS Interface, supply voltage 24 VDC $\pm 20\%$
- 4 Optional: Analogue Interface, supply voltage 24 VDC $\pm 20\%$

Output signal Impuls Interface 1XX

- 1 Standard: Start Stop Signal (P) (M)
- 2 Alternative: Measuring time / impuls range (L)

Output signal Synchronous Serial Interface 2XX

- 1 Standard: 24 Bit
- 2 Alternative: 25 Bit

Output signal DyMoS Interface 3XX

- 1 Standard: Pos. 1 + Vel. 1
- 2 Optional: Pos. 1 + Pos. 2
- 3 Optional: (Pos. 1 + Vel. 1) and (Pos 2 + Vel.2) two channel

Output signal Analogue Interface 4XX

- 1 Standard: Voltage output
- 2 Optional: Current output

Impuls Interface Start Stop Signal 11X

- 4 Standard: Variable for 1 to 3 PG

Impuls Interface measuring time / impuls range 12X

- 1 Standard

Synchronous Serial Interface 2XX

- 1 Standard: Binary Code with resolution 5 μm
- 2 Alternative: Gray Code with resolution 5 μm

DyMoS Interface 3XX

- 1 Standard: Binary Code with resolution 5 μm

Analogue Interface voltage output 41X

- 1 Standard: 0 VDC...10 VDC and 10 VDC...0 VDC
- 2 Alternative: 0 VDC...10 VDC (Pos. 1 + Pos. 2)
- 3 Optional: -10 VDC ...+10 VDC and +10 VDC...-10 VDC

Analogue Interface current output 42X

- 1 Standard: 0 mA...20 mA
- 2 Alternative: 20 mA...0 mA
- 3 Alternative: 4 mA...20 mA
- 4 Alternative: 20 mA...4 mA

Electrical connection

- 101 Alternative: 8 pin round connector IEC130-9
- 102 Standard: 8 pin round connector M 12x1
- 201 Alternative: NT standard cable 1 m

T M I 0 8 0 0 0 0 2 1 1 1 1 0 1

Series

Defined electr. range

Standard: 0100 up to 4500 mm, in mm, divers stadard lengths
 Optional: 0100 up to 4500 mm, in mm, other lengths in 10 mm steps

Mech. configuration

002 Alternative: screw flange M 18 x 1.5

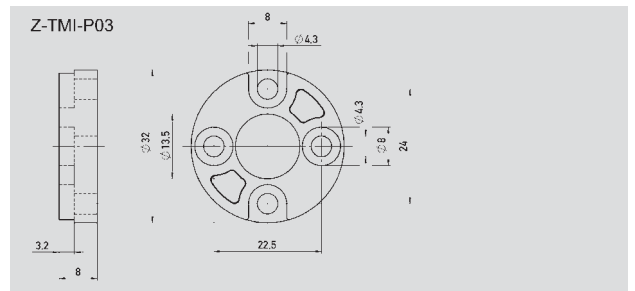
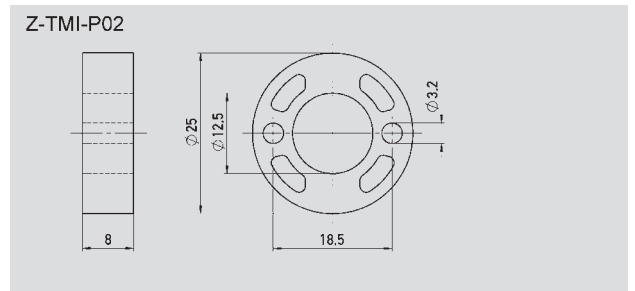
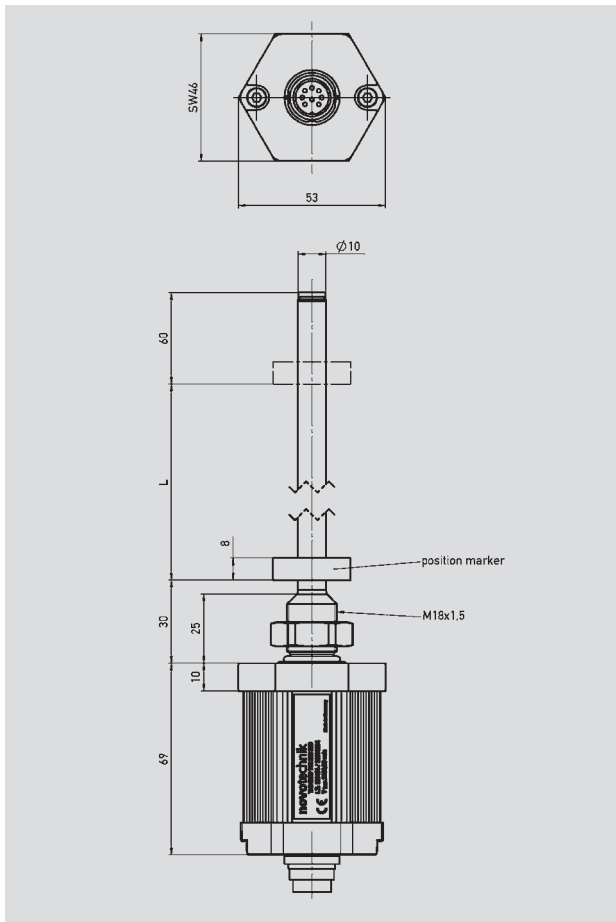
Required accessories

Position marker Z-TMI-P02,
 Art.No. 005652,
 position marker Z-TMI-P03,
 Art.No. 005653
 weight ca. 12 g, plastic ver-
 sion

Recommended accessories

Connector IEC 130-9
 EEM 33-84, IP67,
 Art.No. 005627,
 Angle connector IEC 130-9
 EEM 33-85, IP67,
 Art.No. 005628,
 Connector M12 x 1 (2 m
 cable) EEM 33-86, IP67,
 Art.No. 005629, 5 and 10 m
 cable on request,
 Angle connector M12 x 1
 (2 m cable) EEM 33-87, IP67,
 Art.No. 005630, 5 and 10 m
 cable on request

Subject to change.
 Preliminary data sheet.



Pin configuration	cable	Start-Stop pulse interface	SSI interface	"DyMoS" interface	Analogue interfaces
PIN 1	YE	+ INIT	+ Clk	+ Clk	0(4)...20 mA
PIN 2	GY	+ Start/Stop	+ Data	+ Data 1	0 V output
PIN 3	PK	- INIT	- Clk	- Clk	10...0 V
PIN 4	RD	open	open	- Data 2	open
PIN 5	GN	- Start/Stop	- Data	- Data 1	0...10 V
PIN 6	BU	supply voltage GND	supply voltage GND	supply voltage GND	supply voltage GND
PIN 7	BN	+24 VDC	+24 VDC	+24 VDC	+24 VDC
PIN 8	WH	open	open	+ Data 2	open

Type designations	TMI xxxx 00x 1xx xxx Start-Stop pulse interface	TMI xxxx 00x 2xx xxx Synchronous serial interface	TMI xxxx 00x 3xx xxx "DiMoS" interface	TMI xxxx 00x 4xx xxx Analogue interfaces	
Electrical Data					
Electrically defined range (dimension L)	from 0100 to 4500	from 0100 to 4500	from 0100 to 4500	from 0100 to 4500	mm
Absolute linearity	± 50 µm	≤ ± 30 µm	≤ ± 30 µm	≤ ± 0,02 %	
Resolution	≤ 2 µm	≤ 1 digit	≤ 1 digit	≤ 0,01 %	
Repeatability	≤ 6 µm	≤ 2 digits	≤ 2 digits	≤ 0,02 %	
Hysteresis	≤ 4 µm	≤ 1 digit	≤ 1 digit	≤ 0,01 %	
Supply voltage	24 ± 20 % reverse polarity protected	24 ± 20 % reverse polarity protected	24 ± 20 % reverse polarity protected	24 ± 20 % reverse polarity protected	VDC
Supply voltage ripple	max. 10 %	max. 10 %	max. 10 %	max. 10 %	Vss
Current draw	≤ 80 typical	≤ 80 typical	≤ 100 typical	≤ 100 typical	mA
Output up date rate	≤ 16 (depending on length)	≤ 16	≤ 16	≤ 2	kHz
Shielding	Connected to housing	Connected to housing	Connected to housing	Connected to housing	
Temperature coefficient	≤ 20	≤ 20	≤ 20	30	ppm/K
Humidity coefficient	≤ 20	≤ 20	≤ 20	20	ppm/%RH
Overvoltage protection	40 (Transzorb protection diodes)	40 (Transzorb protection diodes)	40 (Transzorb protection diodes)	40 (Transzorb protection diodes)	VDC
Revers voltage	yes	yes	yes	yes	
Insulation resistance (500 V, 1 bar, 2 s)	≥ 10	≥ 10	≥ 10	≥ 10	MW
Mechanical Data					
Dimensions	see drawing	see drawing	see drawing	see drawing	
Environmental Data					
Operating temperature range	-40...+85	-40...+85	-40...+85	-40...+85	°C
Storage temperature range	-40...+120	-40...+120	-40...+120	-40...+120	°C
Operating humidity range	0...100	0...100	0...100	0...100	%R.H.
Shock per DIN IEC68T2-27	100 (11 ms)	100 (11 ms)	100 (11 ms)	100 (11 ms)	g
Vibration per DIN IEC68T2-6	12 (5...2000 Hz, A _{max} = 0,75 mm)	12 (5...2000 Hz, A _{max} = 0,75 mm)	12 (5...2000 Hz, A _{max} = 0,75 mm)	12 (5...2000 Hz, A _{max} = 0,75 mm)	g
Protection class per DIN 40050 IEC 529 with screwed connector	IP67	IP67	IP67	IP67	
Mechanical data when used with floating position marker					
Compressive range					
Operating pressure	≤ 350	≤ 350	≤ 350	≤ 350	bar
Compression peaks	≤ 530	≤ 530	≤ 530	≤ 530	bar
Cracking pressure	> 500	> 500	> 500	> 500	bar
Traverse speed of position marker	unlimited	unlimited	unlimited	unlimited	ms ⁻¹
Traverse acceleration of position marker	unlimited	unlimited	unlimited	unlimited	ms ⁻²
Life	unlimited (mechanical)	unlimited (mechanical)	unlimited (mechanical)	unlimited (mechanical)	move-ments
Standard electrical stroke length (dimension L) in mm	0100 0150 0200 0250 0300 0350 0400 0450 0500 0550 0600 0650 0700 0750 0800 0850 0900 0950 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000 2250 2500 2750 3000 3500 4000 4500				
CE-conformity					
Emissions	RF noise field strength EN 55011 Group 1 Class A				
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				