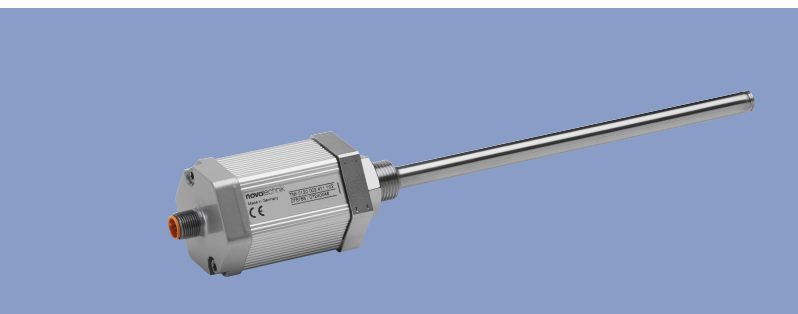


Product discontinued.
Replaced by series TH1.

Transducer up to 4500 mm touchless absolute

Series TMI
with Start-Stop-, SSI-,
DyMoS-, Analogue-
Interface



Special features

- rod style integrable transducer
- NOVOSTRICTIVE® touchless magnetostrictive 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
- analogue interfaces with teach-in function
- low temperature coefficient <20 ppm/K
- insensitive to shock and vibration
- optionally cable or plug connection
- operating pressure up to 350 bar
- screw flange M18x1.5 or 3/4"-16UNF

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 version makes installation even simpler, and the wear-free operation means unlimited mechanical life expectancy and unlimited traverse speed of the position marker and permits stroke lengths up to 4500 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.

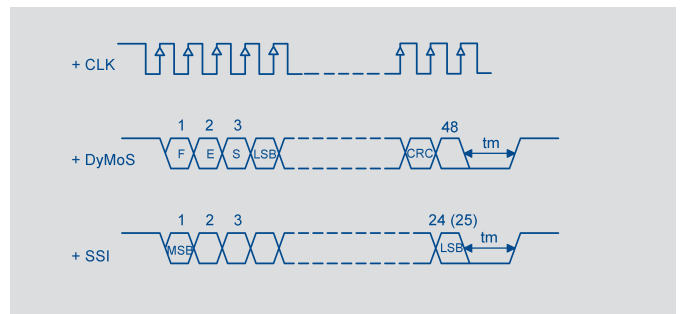
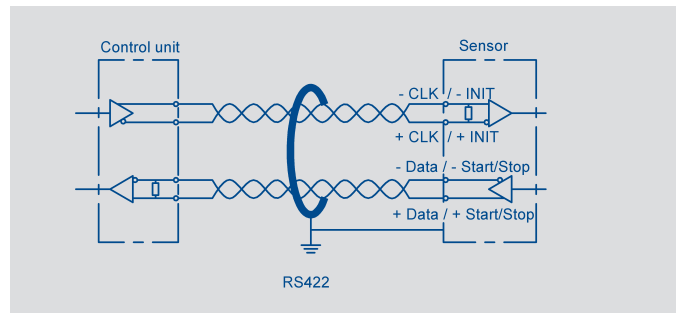
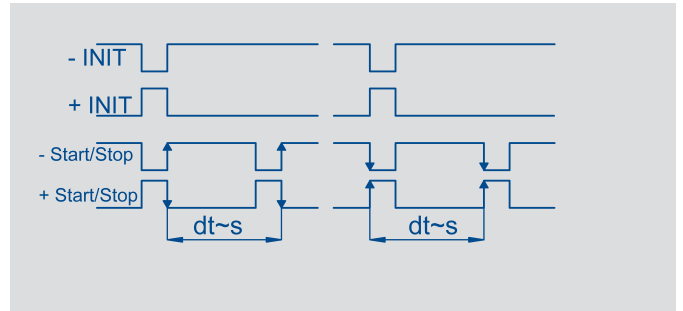
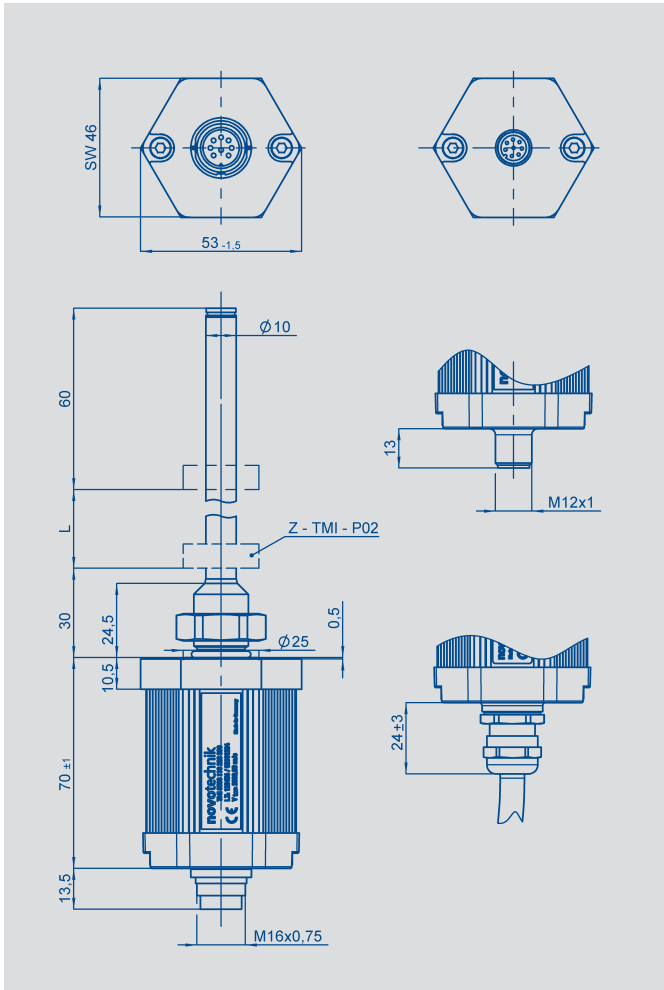
The rod-shape of the transducer allows integration in the pressurized zone of hydraulic and pneumatic cylinders.

The contactless ring-shaped magnet ensures simple fitting of the transducer.

A sophisticated ASIC in the transducer provides for standard absolute output signals. In addition to the familiar interfaces such as the synchronous serial interface (24 or 25 bits), the Start/Stop pulse interface and analogue voltage or current interfaces, 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. Additional interfaces see separate data sheet.

Description	
Housing	Anodized aluminium, Rod: stainless steel
Mounting	Bushing M18x1.5 for screw plug hole per ISO6149 Bushing 3/4"-16UNF for screw plug hole per SAE J475
Position marker	Ring position marker, plastic
Measuring technique	NOVOSTRICTIVE®, touchless magnetostrictive
Electrical connection	8-pin round connector, shielded, M12x1 8-pin round connector, shielded, IEC130-9 8-wire PUR / PVC-cable, 8 x 0.25 mm ² , shielded: 1 m, 5 m or 10 m length
Electronics	Integrated SMD with ASIC Connect cable shield to housing



Connector pin code 101, 102	Cable colors code 201, 203, 205	Connector with cable EEM33-86, EEM33-87	Start-Stop pulse interface	SSI interface	"DyMoS" interface	Analogue interfaces
PIN 1	YE	WH	+ INIT	+ Clk	+ Clk	0(4)...20 mA
PIN 2	GY	BN	+ Start/Stop	+ Data	+ Data 1	Signal GND
PIN 3	PK	GN	- INIT	- Clk	- Clk	+10...0 VDC
PIN 4	RD	YE	do not connect	do not connect	- Data 2	DIAG *
PIN 5	GN	GY	- Start/Stop	- Data	- Data 1	0...+10 VDC
PIN 6	BU	PK	supply voltage GND	supply voltage GND	supply voltage GND	supply voltage GND
PIN 7	BN	BU	+24 VDC	+24 VDC	+24 VDC	+24 VDC
PIN 8	WH	RD	do not connect	do not connect	+ Data 2	PROG *

Additional interfaces see separate data sheets.

The unipolar analogue interfaces includes standard teach-in function via the electrical connection.

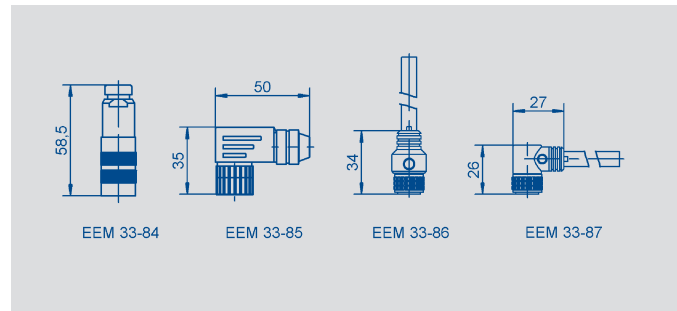
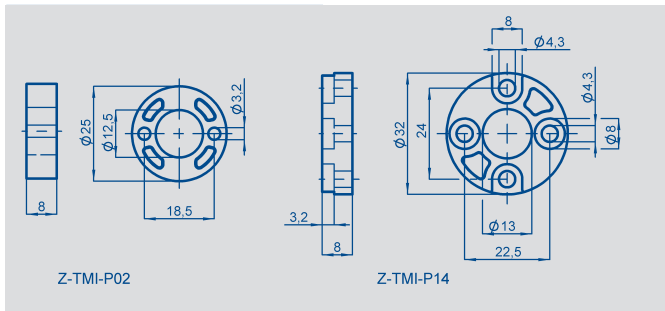
*) connect only for Teach-In function (see manual).

Type designations	TMI - - - - - 1 - - - - - Start-Stop pulse interface	TMI - - - - - 00 - 2 - - - - - Synchronous serial interface	TMI - - - - - 00 - 3 - - - - - "DyMoS" interface	TMI - - - - - 00 - 4 - - - - - Analogue interfaces	
Electrical Data					
Defined electrical range (dimension L)	from 0050 to 4500	from 0050 to 4500	from 0050 to 4500	from 0050 to 4500	mm
Absolute linearity	≤ ± 50 μm	≤ ± 30 μm	≤ ± 30 μm	≤ ± 0,02 % (min. ± 50 μm)	
Output signal	RS422 Impulse	RS422 absolute 24 or 25 bit	RS422 absolute 48 bit synchronous-serial	0.1 ... 10 VDC (load ≥10 kΩ) 0.1 ... 20 mA (burden ≤500Ω) 4 ... 20 mA (burden ≤500Ω)	
Resolution	standardized up to 2800 m/s	1 or 5 μm	5 μm	16 bit	
Reproducibility	≤ 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 %	Vpp
Current draw	≤ 100 typical	≤ 100 typical	≤ 100 typical	≤ 100 typical	mA
Output update rate	0,25 ... 1 (depending on length)	16	16	16	kHz
Shielding	connected to housing	connected to housing	connected to housing	connected to housing	
Temperature coefficient	≤ 20	≤ 20	≤ 20	30	ppm/K
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	MΩ
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...+100	-40...+100	-40...+100	-40...+100	°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	20 (5...2000 Hz, A _{max} = 0,75 mm)	20 (5...2000 Hz, A _{max} = 0,75 mm)	20 (5...2000 Hz, A _{max} = 0,75 mm)	20 (5...2000 Hz, A _{max} = 0,75 mm)	g
Protection class per DIN EN 60529	IP67 with fastened connector IP68 with cable connection	IP67 with fastened connector IP68 with cable connection	IP67 with fastened connector IP68 with cable connection	IP67 with fastened connector IP68 with cable connection	
Mechanical data when used with floating position marker					
Pressure rating					
Working pressure	≤ 350	≤ 350	≤ 350	≤ 350	bar
Pressure peaks	≤ 600	≤ 600	≤ 600	≤ 600	bar
Burst pressure	> 700	> 700	> 700	> 700	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 defined electr. range (dimension L)	0050 up to 1000 in 50 mm steps, 1000 up to 2000 in 100 mm steps, 2000 up to 4500 in 250 mm steps; other lengths in 10 mm steps on request				
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				

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Ordering specifications

Electrical Interface

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

Output signal Impuls Interface 1 _ _

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

Output signal Synchronous Serial Interface 2 _ _

- 1: 24 Bit
- 2: 25 Bit

Output signal DyMoS Interface 3 _ _

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

Output signal Analogue Interface 4 _ _

- 1: Voltage output
- 2: Current output

Impuls Interface Start Stop Signal 11 _

- 4: Variable for 1 to 3 PG

Impuls Interface measuring time / impuls range 12 _

- 1: Standard

Synchronous Serial Interface 2 _ _

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

DyMoS Interface 3 _ _

- 1: Binary Code with resolution 5 μm

Analogue Interface voltage output 41 _

- 1: 0 VDC...10 VDC and 10 VDC...0 VDC
- 2: 0 VDC...10 VDC (Pos. 1 + Pos. 2)

Analogue Interface current output 42 _

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

Electrical connection

- 101: 8 pin round connector IEC130-9
- 102: 8 pin round connector M 12x1
- 201: NT standard cable 1 m
- 203: NT standard cable 3 m
- 205: NT standard cable 5 m

T M I - 0 8 0 0 - 0 0 2 - 1 1 4 - 1 0 2

Series

Defined electr. range
 Several standard lengths
 from 0050 to 4500 mm

Mech. configuration

- 002: Screw flange M 18x1.5
- 003: Screw flange 3/4"-16UNF
- 004: Screw flange M18x1.5 zero point at 51 mm without step $\varnothing 25.0$ mm
- 005: Screw flange 3/4"-16UNF zero point at 51 mm without step $\varnothing 25.0$ mm

Required accessories

Ring position marker
 Z-TMI-P02, Art.No. 005652;
 Z-TMI-P14, Art.No. 005657;
 Other pos. marker and float
 position marker on request.

Recommended accessories

Straight connector IEC 130-9,
 8-pin, EEM 33-84;
 Angled connector IEC130-9,
 8-pin, EEM 33-85;
 PUR cable with 8-pin female
 connector M12x1,
 8 x 0.25 mm², 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, M12x1,
 8 x 0.25 mm², 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
 SSI 26 Bit, SSI two-channel,
 Incremental interface,
 Bipolar voltage interface,
 Field bus interface

Important

Avoid equalizing currents in
 the cable shield caused by
 potential differences.
 Twisted pair cable is recom-
 mended.