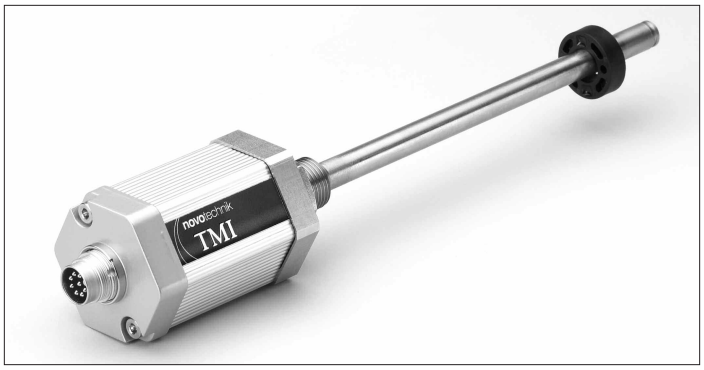
novotechnik
Siedle Group

Transducer
up to 4500 mm
Touchless Absolute

Series TMI with Start/ Stop-, SSI-, DyMoS-, Analog- Interface



Special features

- rod style integrable transducer
- touchless magnetostrictive NOVOSTRICTIVE® measuring process
- high-dynamic serial “DyMoS” interface with data transmission monitoring
- non-contact guiding with ring-shaped position marker
- unlimited mechanical life
- no velocity limit for position marker
- liquid level sensing model available
- 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
- optionally cable or plug connection
- operating pressure up to 350 bar
- screw flange M18x1.5 or 3/4”-16UNF
- analog interfaces have end-user output range programming capability

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 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 due to the measuring principle, design and selected materials. The high mechanical ruggedness of the transducer combined with the underlying measuring technique mean that the transducer 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.

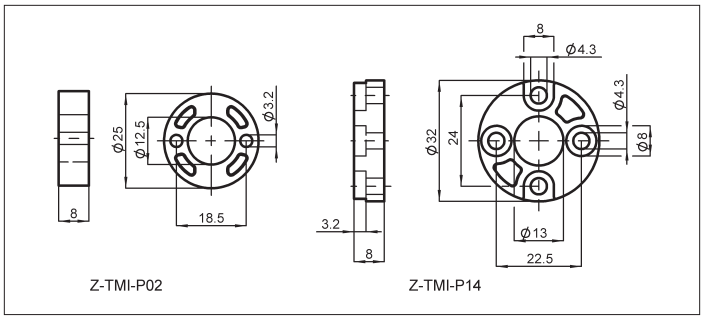
A sophisticated ASIC in the transducer provides for standard absolute output signals. In addition to the familiar interfaces such as the synchronous serial interface (24 or 25 bits), the Start/ Stop pulse interface and analog voltage or current interfaces, a highly dynamic serial "DyMoS" interface with 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 toleranced processing of both edges of the Start/Stop signal. In case of damage of the housing with a special repair-set replacement of the electronics is possible without demounting of the rod out of the pressure area.

As an option, the transducer can also be operated with multiple position markers. Additional interfaces see separate data sheet.

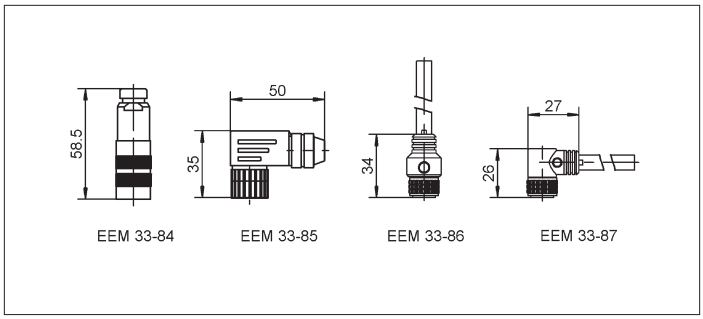
Description	
Housing	Anodized aluminium, rod: stainless steel
Mounting	Bushing M18x1.5 for screw plug hole per ISO6149 Bushing 3/4”-16UNF for screw plug hole per SAE J475
Position marker	Ring position marker, plastic
Measuring technique	Touchless, magnetostrictive “NOVOSTRICTIVE”
Electrical connection	8-pin round connector, shielded, M12x1 8-pin round connector, shielded, IEC130-9 8-conductor cable, shielded, 1 m long
Electronics	Integrated SMD with ASIC Connect cable shield to housing

Novotechnik U.S., Inc.
155 Northboro Road
Southborough, MA 01772

Phone: 508-485-2244
Fax: 508-485-2430
Email: info@novotechnik.com



Z-TMI-P02 Z-TMI-P14



EEM 33-84 EEM 33-85 EEM 33-86 EEM 33-87

Ordering specifications

Electrical Interface
1 Standard: Impulse Interface, supply voltage 24 VDC ±20%
2 Optional: Synchronous Serial Interface, supply voltage 24VDC ±20%
3 Optional: DyMoS Interface, supply voltage 24 VDC ±20%
4 Optional: Analog Interface, supply voltage 24 VDC ±20%

Output signal Impulse Interface 1XX
1 Standard: Start/Stop Signal (P) (M)
2 Alternative: Measuring time / impulse 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 Alternative: Pos. 1 + Pos. 2
3 Optional: (Pos. 1 + Vel. 1) and (Pos 2 + Vel. 2) two channel

Output signal Analog Interface 4XX
1 Standard: Voltage output
2 Optional: Current output

Impulse Interface Start/Stop Signal 11X
4 Standard: Variable for 1 to 3 PG

Impulse Interface measuring time / impulse 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

Analog 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)

Analog 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 M12x1
201 Alternative: NT standard cable 1 m
203 Optional: NT standard cable 3 m
205 Optional: NT standard cable 5 m

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

Series

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

Mech. configuration
002 Standard: screw flange M18x1.5
003 Alternative: screw flange 3/4”-16UNF
004 Alternative: screw flange M18x1.5 zero point at 51 mm without step Ø 25.0 mm
005 Alternative: screw flange 3/4”-16UNF zero point at 51 mm without step Ø 25.0 mm

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

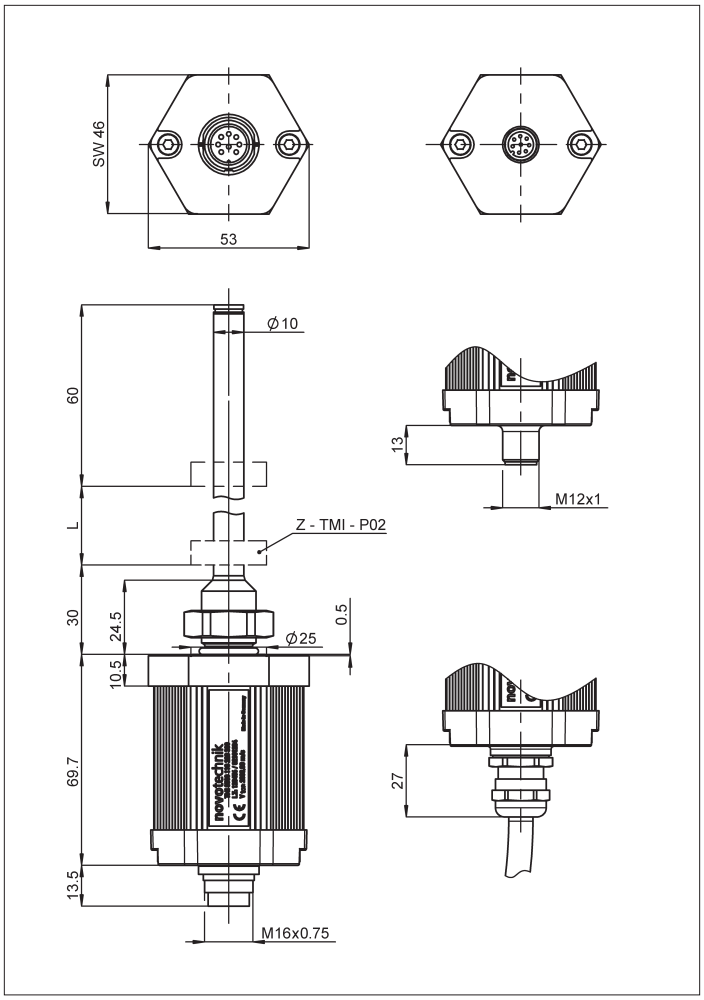
Recommended accessories
Connector IEC 130-9,
EEM 33-84, IP67,
Art.No. 005627;
Angled connector IEC 130-9,
EEM 33-85, IP67,
Art.No. 005628;
Connector M12x1, 2 m cable,
EEM 33-86, IP67,
Art.No. 005629;
Angled connector M12x1,
2 m cable, EEM 33-87, IP67,
Art.No. 005630;
Connector with longer cable length on request

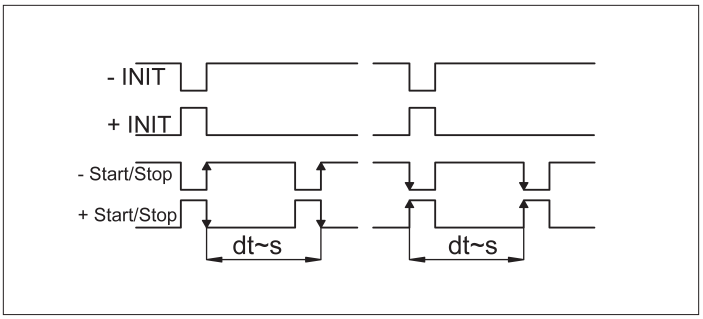
Available on request
Standard cable, 10 m
Specific connectors
Other resolutions
SSI 26 Bit, SSI two-channel,
Current output two-channel,
Incremental interface,
Bipolary voltage interface,
Field bus interface

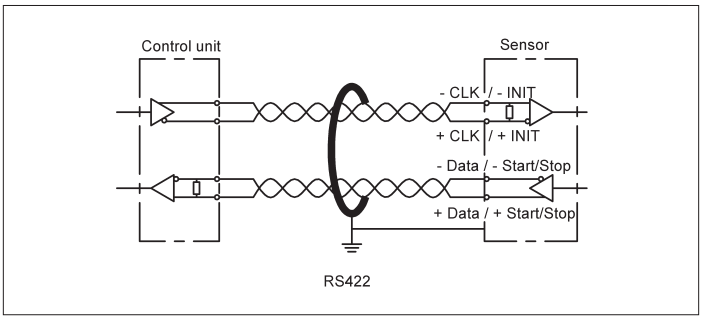
Important
Avoid equalizing currents in the cable shield caused by potential differences. Twisted pair cable is recommended.

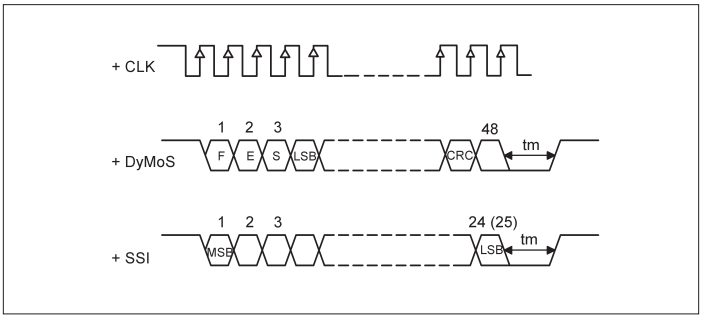
Subject to changes

novotechnik
Siedle Group









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	Analog 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	open	open	- Data 2	open
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	open	open	+ Data 2	open

Additional interfaces see separate data sheets.

The unipolar analog interfaces include standard end-user output range programming capability via the electrical connection.

Novotechnik U.S., Inc.
155 Northboro Road
Southborough, MA 01772

Phone: 508-485-2244
Fax: 508-485-2430
Email: info@novotechnik.com

Type designations	TMI xxxx 00x 1xx xxx Start/Stop pulse interface	TMI xxxx 00x 2xx xxx Synchronous serial interface	TMI xxxx 00x 3xx xxx "DyMoS" interface	TMI xxxx 00x 4xx xxx Analog interfaces	
Electrical Data					
Defined electrical range (dimension L)	from 50 to 4500	from 50 to 4500	from 50 to 4500	from 50 to 4500	mm
Absolute linearity	≤ ± 50 µm	≤ ± 30 µm	≤ ± 30 µm	≤ ± 0.02% (min. 50 µm)	
Output signal	impulse	digital	digital	0...10 VDC (load ≥10 kΩ) 0 (4)...20 mA (burden ≤500Ω)	
Resolution	≤ 2 µm	≤ 1 digit	≤ 1 digit	≤ 0.01%	
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	16	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
Reverse 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 40050 IEC 529	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 Pressure peaks Burst pressure	 ≤ 350 ≤ 600 > 700	 ≤ 350 ≤ 600 > 700	 ≤ 350 ≤ 600 > 700	 ≤ 350 ≤ 600 > 700	 bar bar 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)	movements
Standard defined electr. range (dimension L)	50 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				

Subject to changes