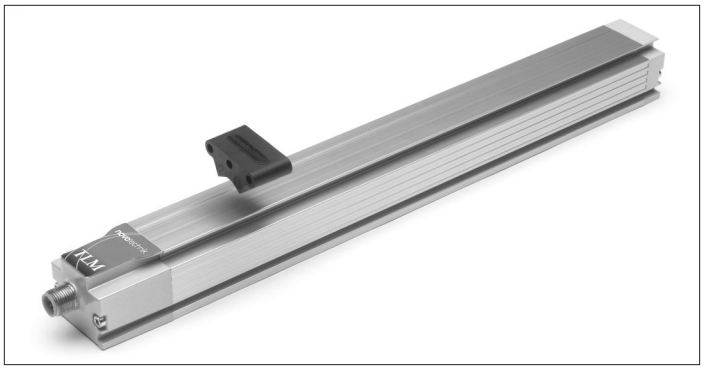
Non-Contacting Absolute Position Transducers up to 4500 mm

TLM Series



Special features

- absolute transducer, no slide arm required
- non-contact magnetostrictive *NOVOSTRICTIVE* measuring process
- high-dynamic serial “DyMoS” interface with data transmission monitoring
- non-contact guiding with floating position marker
- unlimited mechanical life
- no velocity limit for position marker
- outstanding linearity performance to < 30 µm
- resolution to < 2 µm regardless of stroke length
- low temperature coefficient < 20 ppm/K
- insensitive to shock and vibration
- optional cable out or quick disconnect
- protection class IP 67

TLM transducers employ 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.

Design of the TLM series permits very fast measurements with a data output update rate of ≤ 62.5 µs for all-digital output modes.

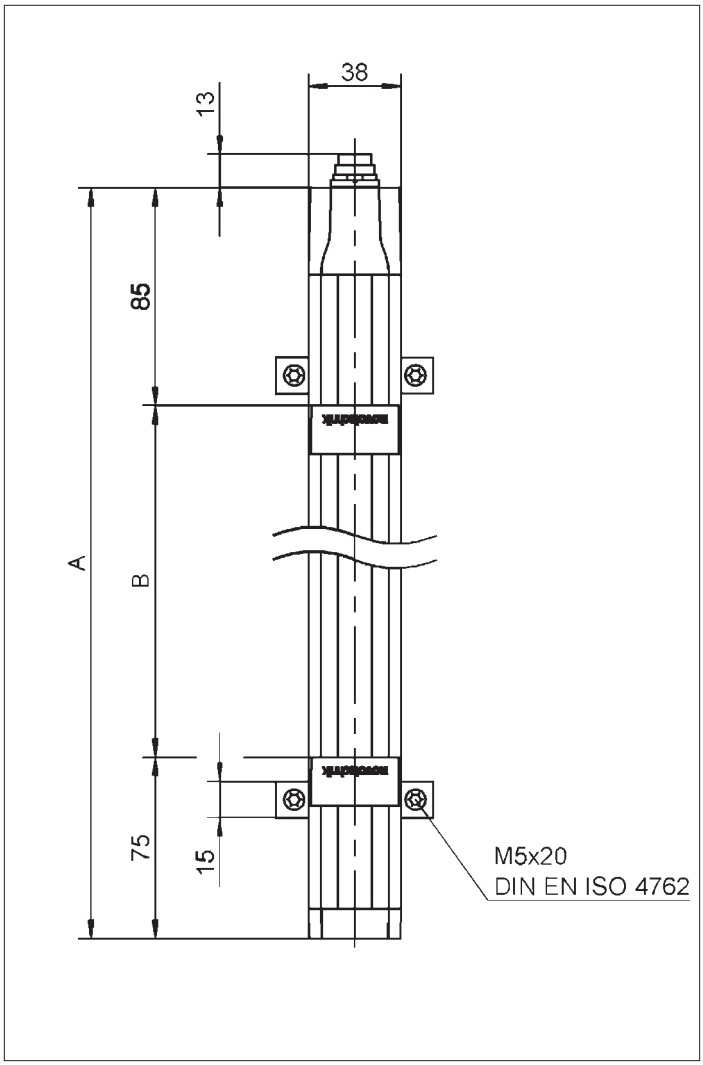
The non-contact coupling (“floating”) marker makes installation simple, and wear-free operation means unlimited mechanical life expectancy and unlimited traverse speed of the position marker.

The temperature coefficient of the transducer is extremely low thanks to the measuring principle, form factor and selected materials.

The high mechanical ruggedness of the transducer combined with the underlying measuring technique means that the system is highly resistant to shock and vibration. The active sensing element is encased in an aluminum housing rated to IP 67. This makes the transducer resistant to contamination, dust, moisture and oil. Mounting is accomplished using clamps that allow precise mechanical adjustment.

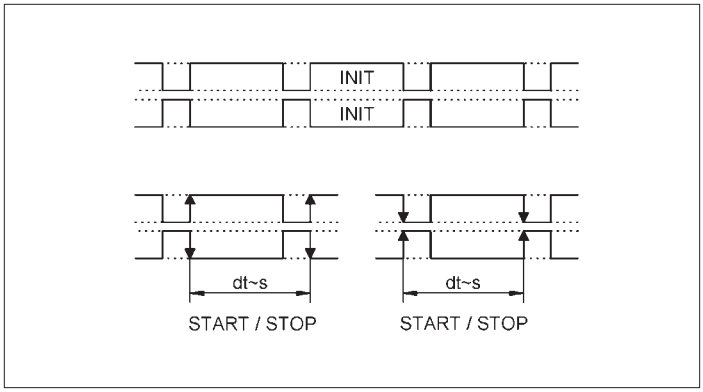
A sophisticated ASIC in the transducer provides standard absolute output signals. In addition to familiar interfaces such as the synchronous serial interface (24 or 25 bits) and the Start/Stop pulse interface, a high-dynamic serial “DyMoS” interface with data transfer monitoring is offered. The advantages of conventional interfaces and bus interfaces are combined in Novotechnik’s “DyMoS” interface. In addition to position value, the “DyMoS” interface can transmit the actual traverse velocity. The pulse interface can provide fully-toleranced processing of both edges of the Start/Stop signal. As an option, the transducer can also be operated with multiple position markers.

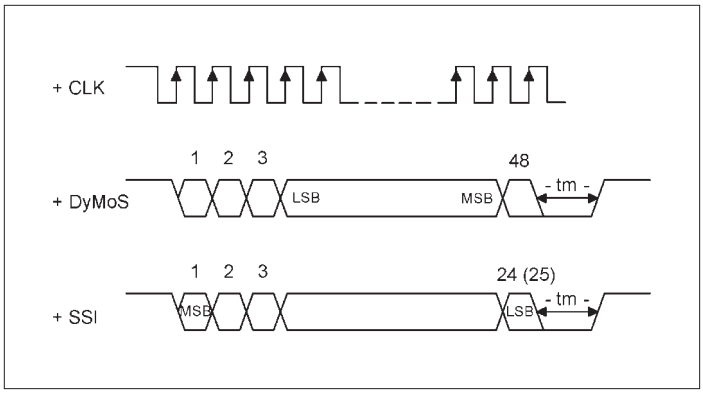
Description	
Housing	anodized aluminum with metal end cap
Mounting	compression clamps, longitudinally adjustable
Position marker	floating marker, plastic guided marker, ball coupling
Measuring technique	non-contact, magnetostrictive “NOVOSTRICTIVE”
Electrical connection	8-pin round connector, shielded, 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

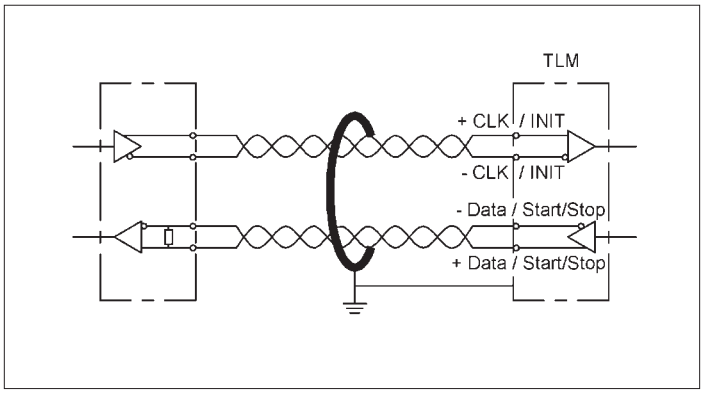


		Start/Stop pulse interface	Analog interfaces
PIN 1	YE	+ INIT	0 (4) to 20 mA
PIN 2	GY	+ START / STOP	0 V output
PIN 3	PK	- INIT	10 to 0 V
PIN 4	RD	n/c	n/c
PIN 5	GN	- START / STOP	0 to 10 V
PIN 6	BU	Supply GND	Supply GND
PIN 7	BN	+24 VDC	+24 VDC
PIN 8	WH	n/c	n/c

		SSI interface	"DyMoS" interface
PIN 1	YE	+ CLK	+ CLK
PIN 2	GY	+ DATA	+ DATA 1
PIN 3	PK	- CLK	- CLK
PIN 4	RD	n/c	- DATA 2
PIN 5	GN	- DATA	- DATA 1
PIN 6	BU	Supply GND	Supply GND
PIN 7	BN	+24 VDC	+24 VDC
PIN 8	WH	n/c	(+ DATA 2)







Type designations	TLM xxxx 001 1xx xxx Start/Stop pulse interface	TLM xxxx 001 2xx xxx Synchronous serial interface	TLM xxxx 001 3xx xxx “DyMoS” interface	TLM xxxx 001 4xx xxx Analog interfaces	
Electrical Data					
Electrically defined range (dimension B)	from 100 to 4500	from 100 to 4500	from 100 to 4500	from 100 to 4500	mm
Absolute linearity	±50 µm	≤ ±30 µm	≤ ±30 µm	≤ 0.02%	
Output signal	impulse	digital	digital	0...10 VDC, 0 (4)...20 mA	
Resolution	≤ 2 µm	≤ 1 digit (≤ 5 µm)	≤ 1 digit (≤ 5 µm)	≤ 0.01%	
Repeatability	≤ 6 µm	≤ 2 digits (≤ 10 µm, 5 µm typ.)	≤ 2 digits (≤ 10 µm, 5 µm typ.)	≤ 0.02%	
Hysteresis	≤ 4 µm	≤ 1 digit (≤ 5 µm)	≤ 1 digit (≤ 5 µm)	≤ 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	≤ 100 typ.	≤ 100 typ.	≤ 100 typ.	≤ 100 typ.	mA
Output update rate	≤ 16 (depending on length)	≤ 16 (62.5 µs)	≤ 16 (62.5 µs)	≤ 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
Reverse 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	
Physical length (dimension A)	Dimension B + 160	Dimension B + 160	Dimension B + 160	Dimension B + 160	±2 mm
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, Amax = 0.75 mm)	12 (5...2000 Hz, Amax = 0.75 mm)	12 (5...2000 Hz, Amax = 0.75 mm)	12 (5...2000 Hz, Amax = 0.75 mm)	g
Protection class per DIN 40050 IEC 529 with connector attached	IP 67	IP 67	IP 67	IP 67	
Mechanical Data when used with floating position marker					
Traverse speed of position marker	unlimited	unlimited	unlimited	unlimited	m/s
Traverse acceleration of position marker	unlimited	unlimited	unlimited	unlimited	m/s^2
Useful life	unlimited (mechanical)	unlimited (mechanical)	unlimited (mechanical)	unlimited (mechanical)	movements

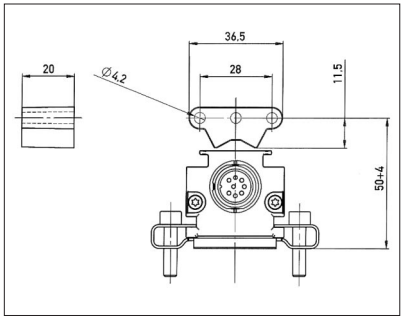
Standard electrical stroke in mm (dimension B)

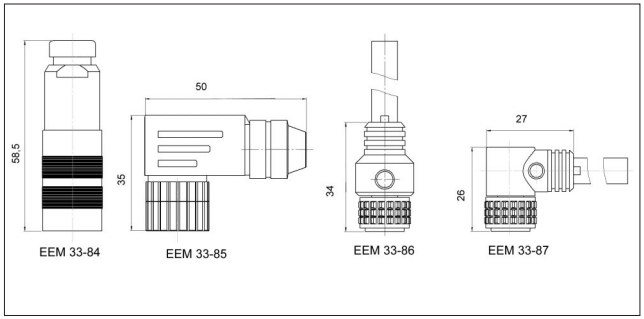
100	130	150	225	300	360	450	500	600	750	1000	1250	1500	1750	2000	2500	3000	3500	4000

Optional electrical stroke in mm (dimension B)

175	200	250	275	400	550	650	700	800	850	900	950	4500

CE-conformity	
Emissions	RF noise field strength EN 55011 Group 1 Class
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





Ordering specifications

Electr. Interface
1 Impulse Interface, supply voltage 24 VDC ±20%
2 Synchronous Serial Interface, supply voltage 24 VDC ±20%
3 DyMoS Interface, supply voltage 24 VDC ±20%
4 Analog Interface, supply voltage 24 VDC ±20%

Output signal Impulse Interface 1XX
1 Standard: Start/Stop Signal (P) (M)
2 Optional: Measuring time / impulse range (L)

Output signal Synchronous Serial Interface 2XX
1 Standard: 24 Bit
2 Optional: 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 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
2 Optional: Gray Code

DyMoS Interface 3XX
1 Standard: Binary Code

Analog Interface voltage output 41X
1 Standard: 0 VDC...10 VDC and 10 VDC...0 VDC
2 Optional: 0 VDC...10 VDC (Pos. 1 + Pos. 2)

Analog Interface current output 42X
1 Standard: 0 mA...20 mA
2 Optional: 20 mA...0 mA
3 Optional: 4 mA...20 mA
4 Optional: 20 mA...4 mA

Electrical connection
101 Standard: 8-pin round connector IEC130-9
102 Optional: 8-pin round connector M12 x 1
201 Optional: NT standard cable 1 m

T	L	M		0	8	0	0		0	0	1		1	1	1		1	0	1

Series

Defined electr. range
Several standard lengths from 0100 to 4500

Mech. configuration
001 Standard: Profile design

Required accessories
Floating position marker
Z-TLM-P01, weight ca. 12 g, Plastic version
Art. No. 005651

Recommended accessories
Connector IEC 130-9
IP 67, EEM 33-84
Art. No. 005627

Angle connector IEC 130-9
IP 67, EEM 33-85
Art. No. 005628

Connector M12 x 1 (2 m cable)
IP 67, EEM 33-86
Art. No. 005629

Angle connector M12 x 1
IP 67, EEM 33-87
Art. No. 005630

Included in delivery
Mounting clamps Z 46
Electrically isolating including fillister head screws

Avoid equalizing currents in the cable shield caused by potential differences.

Subject to changes