

Non-Contacting Position Transducer For Internal Applications

TLI Series



Special features

- non-contacting measuring system, Indres
- for integration in hydraulic and pneumatic cylinders
- accuracy up to 0.15%
- resolution better than 0.01 mm
- operating speed up to 10 m/s
- compressive strength 35 MPa, compression peaks up to 60 MPa
- screw flange M18x1.5 or 3/4–16UNF, plug-in flange Ø48 mm (other flanges on request)
- plug or cable connection option available

TLI position transducers can be integrated directly into the pressure chamber of cylinders, providing compact and cost-effective position assessments.

A new non-contact measurement method provides the advantages of potentiometric systems, while being virtually wear-free.

This measuring technology called "Indres" (inductive-resistive) is insensitive to vibrations, and it is not affected by static magnetic fields or dynamic and static electric fields. Its good EMC properties exclude interference, the linearity values, depending on the design, are up to $\pm 0.1\%$ without linearization, and the resolution reaches 16 bit. The ambient temperature may be between -40 and 150 °C.

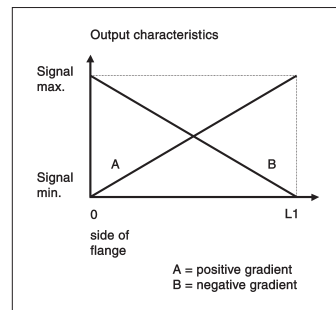
In addition to the standard configuration, the modular construction provides customer specific terminal flanges and mounting variations.

Please find further details under "Technical Reference Information".

Description	
Dimensions	see drawing
Connection flange	stainless steel
Guide rail	aluminum, anodized
Resistance element	conductive plastic
Probe carrier	plastic
Slider housing	plastic
Electrical connections	shielded cable with 4 lead wires, 1 m long 5-pin plug connection
Electronics	SMD, sealed

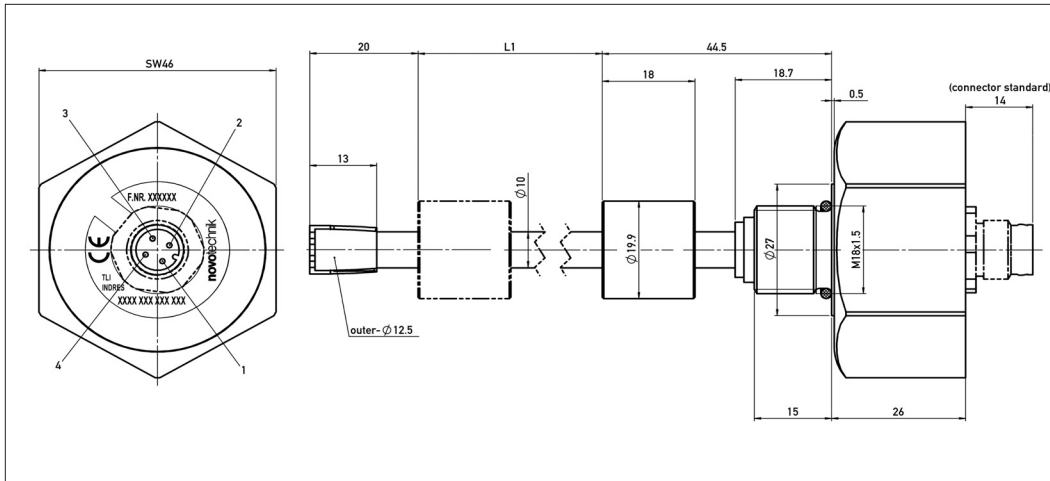
	Plug	Cable
Ground	Pin 1	brown
Current output	Pin 2	white
Voltage supply	Pin 3	green
Not assigned	Pin 4	-
Voltage output	Pin 5	yellow

Note:
Connect shield of the connecting cable to ground of your own electronics.
Do not connect the shield of the connecting cable to the sensor.

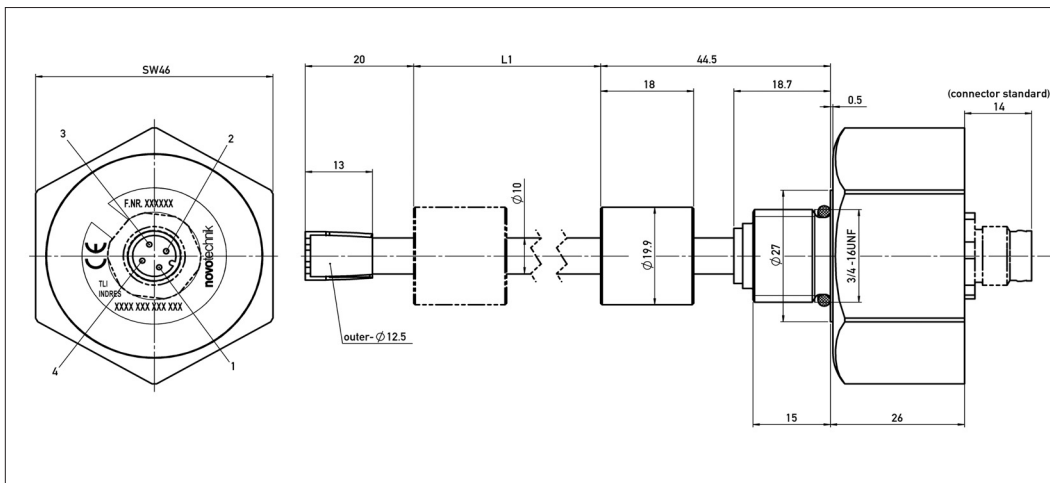


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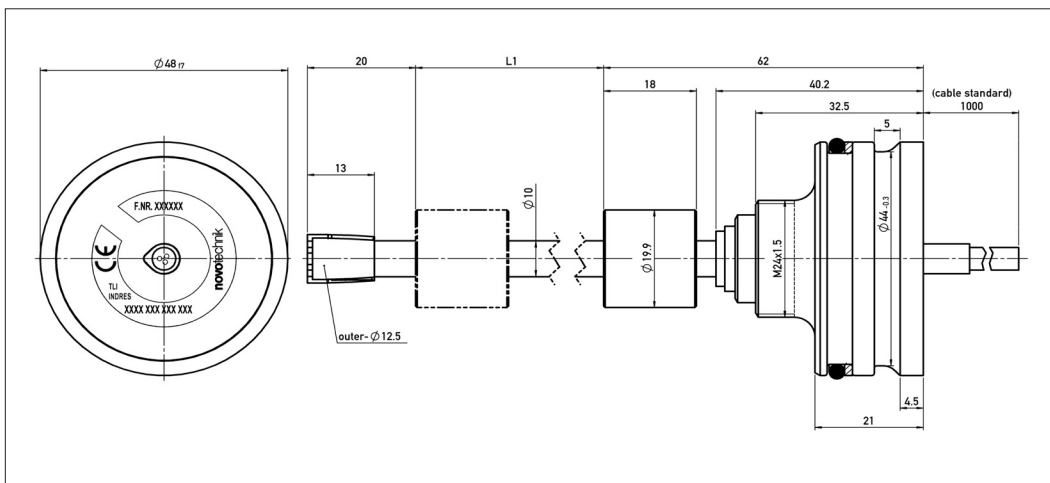
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Screw flange M18x1.5



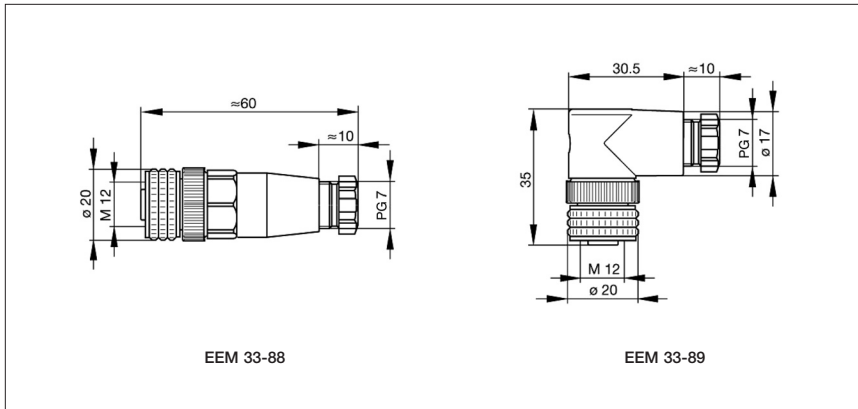
Screw flange 3/4-16UNF



Plug-in flange Ø48 mm

Subject to changes
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Type designations	TLI 50	TLI 100	TLI 150	TLI 200	TLI 250	TLI 300	TLI 400	TLI 500	TLI 600	TLI 800	TLI 1000	
Electrical Data												
Defined electrical range	50	100	150	200	250	300	400	500	600	800	1000	mm
Independent linearity	0.2	0.2	0.2	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	±%
Reproducibility	12.5	15	17.5	20	22.5	25	30	35	40	50	60	µm
Repeatability	2.5	5	7.5	10	12.5	15	20	25	30	40	50	µm
Hysteresis	10											µm
Gradient tolerance	0.3											±%
Operating voltage Ub												
1) standard Ub1	18...30											
2) alternative Ub2	8.5...16.5											VDC
Ripple of operating voltage	max. 1											VDC
Current consumption												
Ub1	max. 30 (without signal current)											mA
Ub2	max. 25 (without signal current)											mA
Output signal												
1) standard	0.1...10 (only Ub1, load ≥ 10 kΩ)											VDC
2) alternative	4...20 (only Ub1, burden ≤ 500 Ω)											mA
3) alternative	0...20 (only Ub1, burden ≤ 500 Ω)											mA
4) alternative	0.5...4.5 (only Ub2)											VDC
Output characteristics												
a) standard	positive gradient, seen from flange											
b) alternative	negative gradient, seen from flange											
Temperature coefficient	< 50 (voltage output)											ppm/K
	< 80 (current output)											ppm/K
Max. tolerable voltage at Ub1	40 (max. 100 ms)											VDC
at Ub2	24 (max. 5 min)											VDC
Mechanical Data												
Dimensions	see drawing											
Operating force	max. 0.1											N
Operating speed	max. 10 (mechanical)											m/s
Operating acceleration	max. 300											m/s ²
Radial load on probe	max. 0.5											N
Pressure	max. 35 (compression peaks up to 60)											MPa
Mechanical stop resistance	5 (max. 50 times)											N
Environmental Data												
Temperature range at Ub1	-40...+80											°C
at Ub2	-40...+105											°C
Humidity range	0...3 (H ₂ O in oil)											%
Shock (DIN IEC 60068-2-27)	50 (11 ms)											g
Vibration (DIN IEC 60068-2-6)	6 (electrical function 10 Hz...150 Hz, mechanical function 10 Hz...2000 Hz)											g
Life	200,000											km
Protection class (DIN 40050 / IEC 529)	IP 67											
CE-conformity												
EN 61 000-6-2 (4,99, interference resistance)												
EN 50061-1 (1.92, emitted interference lim.)												



Ordering specifications

Operating voltage

- 5 Optional: 5 VDC (4.75 VDC...5.25 VDC)
- 6 Optional: 12/24 VDC (8.0 VDC...32.0 VDC)
- 7 Standard: 24 VDC (16.0 VDC...32.0 VDC)

Output signal/supply voltage 5 VDC (Ub5)

- 1 Standard: 5%...95% of current supply

Output signal/supply voltage 12/24 VDC (Ub6)

- 5 Standard: 0.25 VDC...4.75 VDC

Output signal/supply voltage 24 VDC (Ub7)

- 1 Standard: 0 VDC...10 VDC
- 2 Optional: 4 mA...20 mA

Output characteristics

- 1 Standard: positive gradient, seen from flange

Electrical characteristics

- 102 Standard: 4-pin connector M12x1
- 201 Alternative: NT standard cable 1 m
- 203 Optional: NT standard cable 3 m
- 205 Optional: NT standard cable 5 m
- 301 Optional: NT conductor with lead wires 85 mm
- 302 Optional: NT conductor with lead wires 120 mm

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Series

Mechanical specifications

- 101 Standard: plug-in flange Ø 48.0 mm
- 102 Alternative: screw flange M18x1.5
- 103 Alternative: screw flange 3/4" 16UNF

Defined electrical range

Standard: 0050 up to 0600; specified in mm; other lengths in 10 mm increments

Included in delivery

- 1 spring washer
- 1 lock ring

Recommended accessories

- Mating plug EEM 33-88
 Art. No. 005633
 protection class IP 67
- Right-angled plug EEM 33-89
 Art. No. 005634
 protection class IP 67

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