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 ±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".
Screw flange M18x1.5

Screw flange 3/4–16UNF

Plug-in flange Ø48 mm

Subject to changes
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Type designations

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### Electrical Data

#### Defined electrical range
- 50 mm
- 100 mm
- 150 mm
- 200 mm
- 250 mm
- 300 mm
- 400 mm
- 500 mm
- 600 mm
- 800 mm
- 1000 mm

#### Independent linearity
- 0.2 mm
- 0.2 mm
- 0.2 mm
- 0.15 mm
- 0.15 mm
- 0.15 mm
- 0.15 mm
- 0.15 mm
- 0.15 mm
- 0.15 mm
- ±%

#### Reproducibility
- 12.5 mm
- 15 mm
- 17.5 mm
- 20 mm
- 22.5 mm
- 25 mm
- 30 mm
- 35 mm
- 40 mm
- 50 mm
- 60 mm
- μm

#### Repeatability
- 2.5 mm
- 5 mm
- 7.5 mm
- 10 mm
- 12.5 mm
- 15 mm
- 20 mm
- 25 mm
- 30 mm
- 40 mm
- 50 mm
- μm

#### Hysteresis
- 10 mm
- μm

#### Gradient tolerance
- 0.3 mm
- ±%

**Operating voltage Ub**

1) **standard** Ub1
- 18...30 VDC

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
- 0...20 (only Ub1, burden ≤ 500 Ω) mA
- 0.5...4.5 (only Ub2) VDC

3) **alternative**
- 4...20 (only Ub1, burden ≤ 500 Ω) mA
- 0...20 (only Ub1, burden ≤ 500 Ω) mA
- 0.5...4.5 (only Ub2) VDC

#### Output characteristics

- Temperature coefficient
- < 50 (voltage output) ppm/K
- < 80 (current output) ppm/K

#### Max. tolerable voltage at Ub1
- 40 (max. 100 ms) VDC
- 24 (max. 5 min) VDC

- Pressure
- max. 35 (compression peaks up to 60) MPa

- Mechanical stop resistance
- 5 (max. 50 times) N

### Mechanical Data

#### Dimensions
- see drawing

#### Operating force
- max. 0.1 N

#### Operating speed
- max. 10 (mechanical) m/s

#### Operating acceleration
- max. 300 m/s²

#### Radial load on probe
- max. 0.5 N

### Environmental Data

#### Temperature range at Ub1
- -40...+80 °C
- -40...+105 °C

#### Humidity range
- 0...3 (H₂O 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 (1.02, emitted interference lim.)
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