**Transducer**

**up to 4500 mm touchless absolute**

**Series TLM with CANopen interface**

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**Special features**

- Absolute transducer, no slide arm required
- NOVOSTRICTIVE®, touchless magnetostrictive measuring process
- Non-contacting guiding with floating 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
- Low temperature coefficient <20 ppm/K
- Insensitive to shock and vibration
- Optionally cable or plug connection
- Protection class IP67 / IP68
- CANopen compatible CiA standard DS-301 Rev. 4.02 and standard device profile DSP-406 Rev. 3.1
- Encoder class C1
- Up to 2 position markers adaptable
- Speed, cams programmable
- Address adjustment via LSS DSP 305 V1.1.2 or SDO object 0x2000
- Autobaud function

Transducers employing the NOVOSTRICTIVE® touchless magnetostrictive measuring process for direct, precise and absolute measurement of linear position in control, positioning and measuring technology.

The measurement is accomplished using a passive position marker which can be moved as a free-floating or guided element.

Side coupling of the position marker reduces the installation envelope size, prevents the pump effect of slide arms and permits stroke lengths up to 4500 mm. 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.

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 active sensing element is encased in an aluminum housing rated to IP 67. This makes the transducer resistant to contamination, dust, moisture and oils.

Mounting is accomplished using clamps that allow precise mechanical adjustment.

A sophisticated ASIC in the transducer provides for standard absolute output signals. The CAN protocol of these transducers is compatible with CiA Standard DS-301 Rev. 4.02 and standard device profile DSP-406 Rev. 3.1 according to encoder class C1. The position and velocity of up to 2 position markers are transmitted on the bus using “Process Data Objects” (PDO’s). Additionally, according to standard freely programmablecams are available to signalize the passing of certain positions.

Via CAN Interface the node-ID, baud rate, transmission mode, transmission cycle time, slope and travel direction and other parameters can be largely varied. The parameters for configuration of the sensor are sent by the CAN controller in “Service Data Objects” (SDO’s). Node ID and data rate are varied either in Layer Setting Service (LSS; nach DSP 305 V1.1.2) or using SDO Object 0x2000. They are stored in non-volatile memory.

As a special feature, the sensor offers the Autobaud function: The Sensor is able to detect the bit rate of the CAN network by “listening” to the communication of existing bus members and to adjust his bit rate accordingly.

Additional interfaces see separate data sheets.

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<th>Description</th>
<th>Details</th>
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<tr>
<td>Housing</td>
<td>Anodized aluminium with metal end cap</td>
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<tr>
<td>Mounting</td>
<td>Compression clamps, longitudinally adjustable</td>
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<tr>
<td>Position marker</td>
<td>Floating marker, plastic Guided marker, ball coupling</td>
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<tr>
<td>Measuring technique</td>
<td>NOVOSTRICTIVE®, touchless magnetostrictive</td>
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<tr>
<td>Electrical connection</td>
<td>5-pin round connector, shielded, M12x1 6-pin round connector, shielded, IEC130-9</td>
</tr>
<tr>
<td>Electronics</td>
<td>Integrated SMD with ASIC Cable shield connected to housing</td>
</tr>
<tr>
<td>PIN</td>
<td>Connector Pin Code 106</td>
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<td>------------------------</td>
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<tr>
<td>1</td>
<td>CAN_L</td>
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<tr>
<td>2</td>
<td>CAN_H</td>
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<td>3</td>
<td>[CAN_SHLD]</td>
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<td>4</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>CAN_V+</td>
</tr>
<tr>
<td>6</td>
<td>CAN_GND</td>
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</table>

**Signal Description**

- **CAN_L**: CAN_L bus line (dominant low)
- **CAN_H**: CAN_H bus line (dominant high)
- **[CAN_SHLD]**: Optional CAN shield (internally connected to CAN_GND)
- **CAN_V+**: 24 VDC
- **CAN_GND**: Ground 0 VDC
Type designations: TLM xxxx xxx 6xx xxx
CANopen interface

Electrical Data

- Defined electrical range (dimension B): from 0050 to 4500 mm
- Absolute linearity: \( \leq \pm 30 \mu m \)
- Output signal: digital (CAN bus)
- Resolution: \( \leq 1 \) digit
- Reproducibility: \( \leq 2 \) digits
- Hysteresis: \( \leq 1 \) digit
- Supply voltage: \( 24 \pm 20 \% \) VDC, reverse polarity protected
- Supply voltage ripple: max. 10 \% Vpp
- Current draw: \( \leq 100 \) typical mA
- Output update rate: \( \leq 16 \) kHz
- Shielding: connected to housing
- Temperature coefficient: \( \leq 20 \) ppm/K
- Overvoltage protection: 40 (Transzorb protection diodes) VDC
- Reverse voltage: yes
- Insulation resistance: \( \geq 10 \) MΩ (500 V, 1 bar, 2 s)

Mechanical Data

- Dimensions: see drawing

Environmental Data

- Operating temperature range: \(-40...+85\) °C
- Storage temperature range: \(-40...+100\) °C
- Operating humidity range: 0...100 \%R.H.
- Shock per DIN IEC68-2-27: 100 (11 ms) g
- Vibration per DIN IEC68-2-6: 20 (5...2000 Hz, A max = 0.75 mm) g
- Protection class per DIN 40050 IEC 529: PR7 with fastened connector

Mechanical data when used with floating position marker

- Traverse speed of position marker: unlimited ms\(^{-1}\)
- Traverse acceleration of position marker: unlimited ms\(^{-2}\)
- Life: unlimited (mechanical) movements

Standard defined electric range (dimension B):
- 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: 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
### Ordering specifications

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<tbody>
<tr>
<td>Series</td>
<td>Defined electr. range</td>
<td>Several standard lengths from 0050 to 4500 mm</td>
<td>Mech. configuration</td>
<td>001: profile design</td>
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#### Electrical Interface

- **6**: CANopen DS301 V 4.1, DS406 V 3.1

#### Output signal CANopen interface 6XX

- 1: 1 x pos. resolution 5 µm and 1 x vel. resolution 0.5 mm/s
- 2: 2 x pos. resolution 5 µm
- 5: 2 x resolution 5 µm and 2 x vel. resolution 0.5 mm/s on request

#### CANopen interface 6XX

- 1: baud rate 1000 kbaud, Default Node-ID 127
- 2: baud rate 900 kbaud, Default Node-ID 127
- 3: baud rate 500 kbaud, Default Node-ID 127
- 4: baud rate 250 kbaud, Default Node-ID 127
- 5: baud rate 125 kbaud, Default Node-ID 127
- 7: baud rate 50 kbaud, Default Node-ID 127
- 8: baud rate 20 kbaud, Default Node-ID 127
- 9: baud rate 10 kbaud, Default Node-ID 127

#### Electrical connection

- 105: 1 x 6-pin round connector IEC130-9
- 106: 1 x 5-pin round connector M12x1

### Included in delivery

- Mounting clamps Z46 electrically isolating incl. fillister head screws

### Required accessories

- Floating position markers Z-TLM-P01, Art.No. 005651, Z-TLM-P04, Art.No. 005654;
- Guided position marker Z-TLM-P05, Art.No. 005655;
- Other position markers on request

### Recommended accessories

- Connector IEC 130-9, EEM 33-82, IP67, Art.No. 005639;
- Angled connector IEC130-9, EEM 33-94, IP67, Art.No. 005648;
- Connector M12x1, EEM 33-73, IP67, Art.No. 005645;
- Angled connector M12x1, EEM 33-75, IP67, Art.No. 005646.

### Available on request

- Other resolutions
- Specific connectors
- Other interface variations Start-Stop, SSI, DyMoS, Analogue, field bus

### Important

- Avoid equalizing currents in the cable shield caused by potential differences. Twisted pairs are recommended.