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. In addition to the familiar interfaces such as the synchronous serial interface (24 or 25 bits), the Start/Stop pulse interface and analogue voltage or current interfaces, a high-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 tolerated processing of both edges of the Start/Stop signal.

As an option, the transducer can also be operated with multiple position markers.

Additional interfaces see separate data sheet.

### Description

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Anodized aluminium with metal end cap</td>
</tr>
<tr>
<td>Mounting</td>
<td>Compression clamps, longitudinally adjustable</td>
</tr>
<tr>
<td>Position marker</td>
<td>Floating marker, plastic Guided marker, ball coupling</td>
</tr>
<tr>
<td>Measuring technique</td>
<td>NOVOSTRICTIVE®, touchless magnetostrictive</td>
</tr>
<tr>
<td>Electrical connection</td>
<td>8-pin round connector, shielded, M12x1</td>
</tr>
<tr>
<td></td>
<td>8-pin round connector, shielded, IEC130-9</td>
</tr>
<tr>
<td></td>
<td>8-conductor cable, shielded, 1 m long</td>
</tr>
<tr>
<td>Electronics</td>
<td>Integrated SMD with ASIC Connect cable shield to housing</td>
</tr>
</tbody>
</table>

### Special features

- Absolute transducer, no slide arm required
- NOVOSTRICTIVE®, touchless magnetostrictive measuring process
- High-dynamic serial DyMoS®-interface with data transmission interface
- 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
- Analogue interfaces with teach-in function
- Low temperature coefficient <20 ppm/K
- Insensitive to shock and vibration
- Optionally cable or plug connection
- Protection class IP67/IP68
## Connector Pin and Cable Colors

<table>
<thead>
<tr>
<th>Connector pin code 101, 102</th>
<th>Cable colors code 201, 203, 205</th>
<th>Connector with cable EEM33-86, EEM33-87</th>
<th>Start-Stop pulse interface</th>
<th>SSI interface</th>
<th>DyMoS® interface</th>
<th>Analogue interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIN 1</td>
<td>YE</td>
<td>WH</td>
<td>+ INIT</td>
<td>- Clk</td>
<td>+ Clk</td>
<td>0(0) ... 20 mA</td>
</tr>
<tr>
<td>PIN 2</td>
<td>GY</td>
<td>BN</td>
<td>+ Start/Stop</td>
<td>+ Data</td>
<td>+ Data 1</td>
<td>Signal GND</td>
</tr>
<tr>
<td>PIN 3</td>
<td>PK</td>
<td>GN</td>
<td>- INIT</td>
<td>- Clk</td>
<td>- Clk</td>
<td>+10 ... 0 (-10) VDC</td>
</tr>
<tr>
<td>PIN 4</td>
<td>RD</td>
<td>YE</td>
<td>open</td>
<td>open</td>
<td>- Data 2</td>
<td>open</td>
</tr>
<tr>
<td>PIN 5</td>
<td>GN</td>
<td>GY</td>
<td>- Start/Stop</td>
<td>- Data</td>
<td>- Data 1</td>
<td>0 (-10) ... +10 VDC</td>
</tr>
<tr>
<td>PIN 6</td>
<td>BJ</td>
<td>PK</td>
<td>supply voltage GND</td>
<td>supply voltage GND</td>
<td>supply voltage GND</td>
<td>supply voltage GND</td>
</tr>
<tr>
<td>PIN 7</td>
<td>BN</td>
<td>BJ</td>
<td>+24 VDC</td>
<td>+24 VDC</td>
<td>+24 VDC</td>
<td>+24 VDC</td>
</tr>
<tr>
<td>PIN 8</td>
<td>WH</td>
<td>RD</td>
<td>open</td>
<td>open</td>
<td>+ Data 2</td>
<td>open</td>
</tr>
</tbody>
</table>

Additional interfaces see separate data sheets.

The unipolar analogue interfaces includes standard teach-in function via the electrical connection.
### Type designations

<table>
<thead>
<tr>
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<th>TLM xxxx 001 1xx xxx</th>
<th>TLM xxxx 001 2xx xxx</th>
<th>TLM xxxx 001 3xx xxx</th>
<th>Analogue interfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start-Stop pulse interface</td>
<td>Synchronous serial interface</td>
<td>DyMoS® interface</td>
<td>Analogue interfaces</td>
<td></td>
</tr>
</tbody>
</table>

### Electrical Data

| Defined electrical range (dimension B) | from 0050 to 4500 | 0 - 10 VDC (load ≥ 10 kΩ)
| Absolute linearity | ≤ ± 50 µm | 0.1 - 10 VDC (load ≥ 10 kΩ)
| Output signal | inputs, digital | 0.1 - 20 mA (burden ≤ 500 Ω)
| Current draw | ≤ 100 mA | 0.1 - 20 mA (burden ≤ 500 Ω)
| Output update rate | 16 kHz | 0.1 - 20 mA (burden ≤ 500 Ω)
| Resolution | ≤ 2 µm | 0.1 - 20 mA (burden ≤ 500 Ω)
| Reproducibility | ≤ 6 µm | 0.1 - 20 mA (burden ≤ 500 Ω)
| Hysteresis | ≤ 4 µm | 0.1 - 20 mA (burden ≤ 500 Ω)
| Supply voltage | 24 V ± 20 % reverse polarity protected | 0.1 - 20 mA (burden ≤ 500 Ω)
| Supply voltage ripple | 10%, max. 10 % reverse polarity protected | 0.1 - 20 mA (burden ≤ 500 Ω)
| Current draw | ≤ 20 mA | 0.1 - 20 mA (burden ≤ 500 Ω)
| Current draw | ≤ 20 mA | 0.1 - 20 mA (burden ≤ 500 Ω)
| Temperature coefficient | ≤ 20 ppm/K | 0.1 - 20 mA (burden ≤ 500 Ω)
| Overvoltage protection | 40 (Transzorb protection diodes) | 0.1 - 20 mA (burden ≤ 500 Ω)
| Reverse voltage | yes | 0.1 - 20 mA (burden ≤ 500 Ω)
| Insulation resistance | ≥ 10 MΩ (500 V, 1 bar, 2 s) | 0.1 - 20 mA (burden ≤ 500 Ω)

### 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 |
| Traverse speed of position marker | unlimited | unlimited | unlimited | unlimited |
| Traverse acceleration of position marker | unlimited | unlimited | unlimited | unlimited |
| Life | unlimited (mechanical) | unlimited (mechanical) | unlimited (mechanical) | unlimited (mechanical) |
| Standard defined electr. 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 |

### Environmental Data

| Operating temperature range | -40...+85 °C | -40...+85 °C | -40...+85 °C | -40...+85 °C |
| Storage temperature range | -40...+100 °C | -40...+100 °C | -40...+100 °C | -40...+100 °C |
| Operating humidity range | 0...100 %R.H. | 0...100 %R.H. | 0...100 %R.H. | 0...100 %R.H. |
| Shock per DIN IEC612-27 | 100 (11 ms) | 100 (11 ms) | 100 (11 ms) | 100 (11 ms) |
| Vibration per DIN IEC612-2-6 | 20 (5...2000 Hz, Amax = 0.75 mm) | 20 (5...2000 Hz, Amax = 0.75 mm) | 20 (5...2000 Hz, Amax = 0.75 mm) | 20 (5...2000 Hz, Amax = 0.75 mm) |
| Protection class per DIN 40050 IEC 529 | IP68 with cable connection | IP68 with cable connection | IP68 with cable connection | IP68 with cable connection |

### Mechanical data when used with unguided position marker

| Traverse speed of position marker | unlimited | unlimited | unlimited | unlimited |
| Traverse acceleration of position marker | unlimited | unlimited | unlimited | unlimited |
| Life | unlimited (mechanical) | unlimited (mechanical) | unlimited (mechanical) | unlimited (mechanical) |

### 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 |
**Ordering specifications**

**Electric 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. Start Stop Signal (P) (M)
2. Measuring time / Impulse range (L)

**Output signal Synchronous Serial Interface 2XX**
1. 24 Bit
2. 25 Bit

**Output signal DyMoS® Interface 3XX**
1. Pos. 1 + Vel. 1
2. Pos. 1 + Pos. 2
3. (Pos. 1 + Vel. 1) and (Pos. 2 + Vel. 2) two channel

**Output signal Analog Interface 4XX**
1. Voltage output
2. Current output

**Impulse Interface Start Stop Signal 11X**
4. Variable for 1 to 3 PG

**Impulse Interface measuring time / Impulse range 12X**
1. Standard

**Synchronous Serial Interface 2XX**
1. Binary Code, resolution 5 µm
2. Gray Code, resolution 5 µm

**DyMoS® Interface 3XX**
1. Binary Code, resolution 5 µm

**Analog Interface voltage output 41X**
1. 0 VDC...10 VDC and 10 VDC...0 VDC
2. 0 VDC...10 VDC (Pos. 1 + Pos. 2)
3. -10 VDC...+10 VDC, +10 VDC...-10 VDC

**Analog Interface current output 42X**
1. 0 mA...20 mA
2. 20 mA...0 mA
3. 4 mA...20 mA
4. 20 mA...4 mA

**Electrical connection**
101: 8 pin round connector IEC130-9
102: 8 pin round connector M12x1
201: NT standard cable 1 m
203: NT standard cable 3 m
205: NT standard cable 5 m

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**Included in delivery**
Mounting clamps Z46, electrically isolating incl. fillister head screws

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

**Recommended accessories**
Connector IEC 130-9, EEM 33-84, IP67, Art.No. 005627;
Angled connector IEC130-9, EEM 33-85, IP67, Art.No. 005628;
Connector M12x1, 2 m cable, EEM 33-86, 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, Field bus interface

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