Position transducer, based on our NOVOPAD non-contacting inductive measurement technology. Provides direct, accurate measurement of travel for display or feedback applications.

The push rod is supported on both ends by metal glide bearings, allowing high lateral forces on the tip of the rod. The robust and compact housing design make the LS1 a reliable solution for the industrial environment.

A ball coupling enables a backlash and shear force free operation, even with perpendicular or angular misalignment between the transducer axis and the direction of movement.

The integrated signal processor with programmable end-points (Teach-in) function provides an absolute and proportional voltage or current output signal. The LS1 uses a non-contacting technology, and is maintenance and wear free. The transducers provide optimal reproducibility, resolution and linearity.

LS1 sensors can be exchanged without recalibration. Magnetic fields do not have any effect on the measurement signal.

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Aluminium, anodized</td>
</tr>
<tr>
<td>Mounting</td>
<td>adjustable clamps</td>
</tr>
<tr>
<td>Actuating rod</td>
<td>stainless steel, AISI 303, external thread M5x0.5</td>
</tr>
<tr>
<td>Ball coupling</td>
<td>hardened ball with spring pressure on carbide plate</td>
</tr>
<tr>
<td>Bearings</td>
<td>both ends in metal-polymer glide bearings</td>
</tr>
<tr>
<td>Measurement principle</td>
<td>NOVOPAD inductive</td>
</tr>
<tr>
<td>Electrical connections</td>
<td>3-pin round connector, shielded, M8 x 1</td>
</tr>
<tr>
<td></td>
<td>3-wire PVC cable, 3x 0,14 mm², shielded 2 m length</td>
</tr>
<tr>
<td>Electronic</td>
<td>SMD with ASIC, integrated</td>
</tr>
</tbody>
</table>

Special features
- long life, up to 100 million movements, depending on application
- resolution 0.05 % or 0.1 %
- outstanding linearity ±0.15 %
- teach-in (min-max) via push-buttons with status LED
- standard voltage or current output signals
- insensitive to magnetic fields
- compact 18x18 mm profile
- double-sided support for push rod
- compatible to standard probe tips
- cable or connector version available
Anziedrehmoment
tightening torque
max. 140 Nm

Kugelkupplung
ball coupling

M4 x 0.5

Kabel 2 m lang
cable 2m long
<table>
<thead>
<tr>
<th>Type designations</th>
<th>LS1</th>
<th>LS1</th>
<th>LS1</th>
<th>LS1</th>
<th>LS1</th>
<th>LS1</th>
<th>LS1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0025</td>
<td>0050</td>
<td>0075</td>
<td>0100</td>
<td>0150</td>
<td>0200</td>
<td></td>
</tr>
</tbody>
</table>

**Electrical Data**

- **Electrical measuring range**: 25 50 75 100 150 200 mm
- **Absolute linearity**: < ± 0.1 < ± 0.15 % FS
- **Tolerance of electrical zero point**: ± 0.5 mm
- **Output signal**
  - 0.1...10 VDC (load 470 kΩ) allowed load > 10 kΩ
  - 10...0.1 VDC (load 470 kΩ) allowed load > 10 kΩ
  - 4...20 mA (load < 500 Ω)
  - 20...4 mA (load < 500 Ω)
- **Internal resistance of voltage output**: 0
- **Output, short-circuit-proof**
  - against supply max. ... 30 VDC and GND (permanent)
- **Repeatability**
  - high speed mode < 10 mV, typical < 3 mV
  - low speed mode < 5 mV, typical < 2 mV
  - high speed mode < 16 µA, typical < 5 µA
  - low speed mode < 8 µA, typical < 3 µA
- **Supply voltage**: 16...30 VDC
- **Supply voltage ripple**: max. 10 % Vss
- **Power consumption without load**: < 1 W
- **Temperature coefficient**: < 50 ppm/K
- **Overvoltage protection**: < 40 (permanent) VDC
- **Polarity protection**: up to Umax VDC
- **Insulation resistance (500 VDC)**: > 10 MΩ

**Mechanical Data**

- **Body length (dimension A)**: 63 88 113 138 188 238 ± 1 mm
- **Mechanical stroke (dimension B)**: 30 55 80 105 155 205 ± 1.5 mm
- **Weight approx.**
  - with cable: 140 160 170 190 220 260 g
  - with connector: 86 107 132 150 190 230 g
- **Operating force (horizontal)**: ≤ 0.3 N
- **Mobility of ball coupling**: ± 1 mm parallel offset, ± 2.5° angular offset
- **Maximum permitted tightening torque for mounting screws**: 140 Ncm

**Environmental Data**

- **Operating temperature range**: -40...+85 °C with connector
  - -30...+100 °C with cable
- **Operating humidity range**: 0...95 % RH (no condensation)
- **Shock per DIN IEC 1011**
  - 100 (11 ms) (single event)
- **Vibration per DIN IEC 20**
  - 10...2000 Hz, Amax = 0.75 mm
- **Protection class**: IP 40 DIN EN 60529
- **Operating velocity maximum**: 5 m/s
- **Operating acceleration maximum**: 5 g
- **Life**: > 100x10⁶ movements
- **MTTF (ISO 13849-1, parts count method, w/o load)**: 24 years

**Functional Safety**

- When using our products in safety-related systems, please contact us

**CE-Conformity**

- **Emission**: RF noise field strength EN 55011, class B
- **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
**Electrical Interface**

**4: Analog interface**

**Electrical connection 101:**
- 3-pin round-connector M8x1, axial output
- NT standard cable 2 m, axial output

**Analog Interface voltage output 41:**
- 1: 0 VDC ... 10 VDC (high speed mode)
- 2: 0 VDC ... 10 VDC (high speed mode)
- 3: 0 VDC ... 10 VDC (low speed mode)
- 4: 0 VDC ... 10 VDC (low speed mode)

**Analog Interface voltage output 42:**
- 1: 4 mA ... 20 mA (high speed mode)
- 2: 20 mA ... 4 mA (high speed mode)
- 3: 4 mA ... 20 mA (low speed mode)
- 4: 20 mA ... 4 mA (low speed mode)

**Output signal analog Interface 4:**
- 1: Voltage output
- 2: Current output

**Mechanical version 001:** Position transducer with one-side actuating rod

**Series**

- Various standard lengths from 0.25 mm up to 2000 mm

**Included in delivery**
- 2 mounting clamps Z-45 incl.
- 4 cylinder screws M4x10
- 1 ball coupling

**Optional accessories**
- 4 mounting clamps Z3-31 incl.
- 4 cylinder screws M4 x 10, P/N 059010;
- PUR-cable with 3-pin female connector, M8 x 1,
  3 x 0.25 mm², shielded:
  - 2 m length, EEM 33-56,
  - 5 m length, EEM 33-58,
  - 10 m length, EEM 33-60;
- PUR-cable with 3-pin female angled connector, M8 x 1,
  3 x 0.25 mm², shielded:
  - 2 m length, EEM 33-57,
  - 5 m length, EEM 33-59,
  - 10 m length, EEM 33-61.

**On request available**
- Customized length and electrical connection e.g. cable with connector.

**Ordering specifications**

<table>
<thead>
<tr>
<th>Output connector Code 101</th>
<th>Cable Code 202</th>
<th>Connector with cable EEM 33-56/-57/-58/-59/-60/-61</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1: GN green</td>
<td>BN brown</td>
<td>Supply voltage</td>
<td></td>
</tr>
<tr>
<td>Pin 4: WH white</td>
<td>BK black</td>
<td>Output signal</td>
<td></td>
</tr>
<tr>
<td>Pin 3: BN brown</td>
<td>BU blue</td>
<td>GND</td>
<td></td>
</tr>
</tbody>
</table>