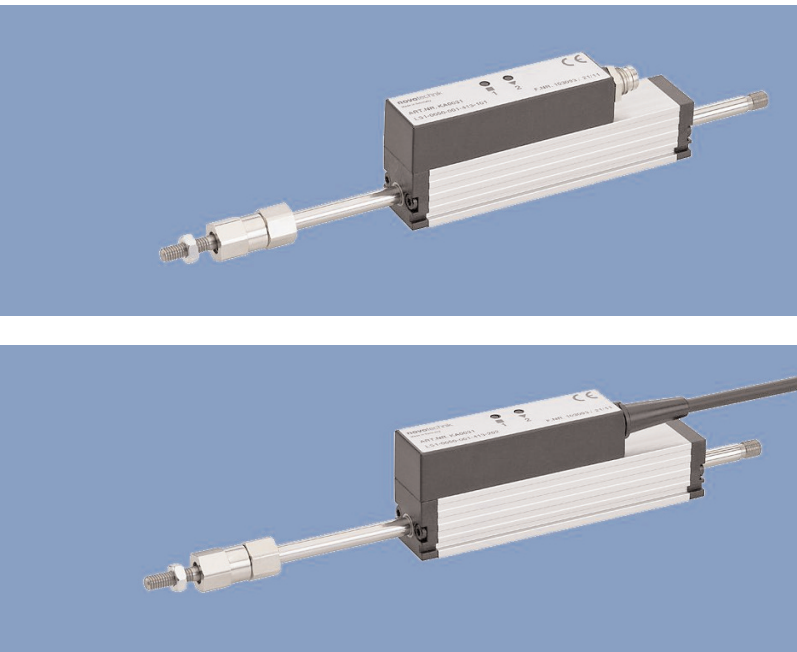


**NOVOPAD**  
**Position Transducers**  
**up to 200 mm**  
**non-contacting**  
**Series LS1**  
with analog interface



**Special features**

- long life up to 100 Mio. movements, depending on application
- compact profile design 18x18 mm
- double-sided supported actuating rod
- pre-assembled ball coupling
- resolution 0.05 % o 0.1 %
- outstanding linearity  $\pm 0.15$  %
- Standard output signals current or voltage
- Teach-In via push-buttons with status LED
- insensitive to magnetic fields
- cable or connector version available

Position transducer with NOVOPAD non-contacting inductive measurement principle on printed circuit board basis, for direct, accurate measurement of travel in display- or feedback applications.

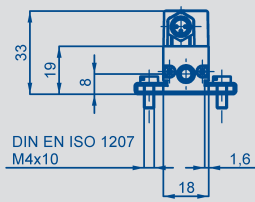
The actuating rod is supported on both ends by slide bearings, allowing high lateral forces on the tip of the rod. The robustness and the compact housing design make the LS1 a reliable solution for industrial environment. A ball coupling enables a backlash- and shear force free operation even with perpendicular or angular misalignment between the transducer axis and the direction of movement.

The integrated signal processor with Teach-In function provides an absolute and proportional current or voltage output signal.

The non-contacting sensors are maintenance and wear-free and convince with an optimal reproducibility, resolution and linearity. The sensor can be exchanged without recalibration. Magnetic fields do not have any effects on the measurement signal.

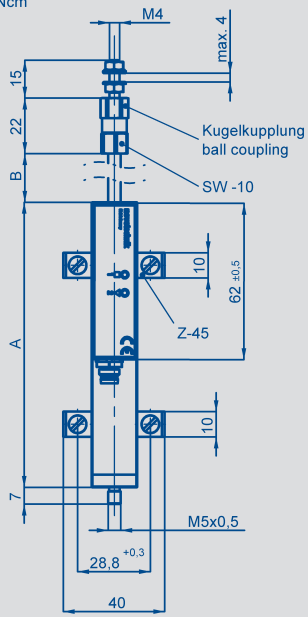
Description	
Housing	Aluminium, anodized
Mounting	adjustable clamps
Actuating rod	stainless steel, AISI 303, external thread M5x0.5
Ball coupling	hardened ball with spring pressure on carbide plate
Bearings	both ends in metal-polymer slide bearings
Measurement principle	NOVOPAD inductive, based on printed circuit board
Electrical connections	3-pin round connector, shielded, M8 x 1 3-wire PVC-cable, 3 x 0.14 mm <sup>2</sup> , shielded, 2 m length
Electronic	SMD with ASIC, integrated

Standard (Z-45)

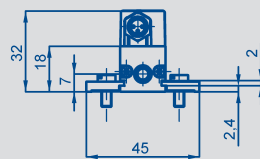


DIN EN ISO 1207  
M4x10

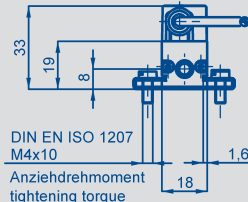
Anziehdrehmoment  
tightening torque  
max. 140 Ncm



Optional (Z3-31)



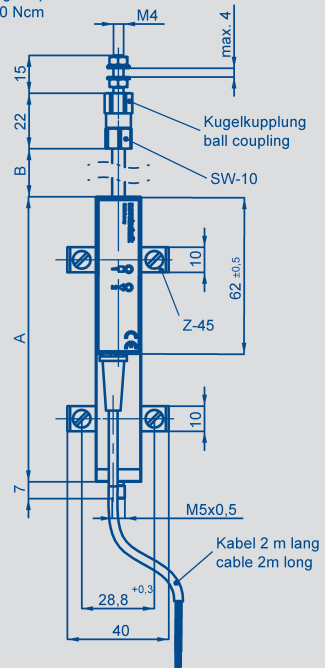
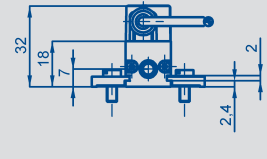
Standard (Z-45)



DIN EN ISO 1207  
M4x10

Anziehdrehmoment  
tightening torque  
max. 140 Ncm

Optional (Z3-31)

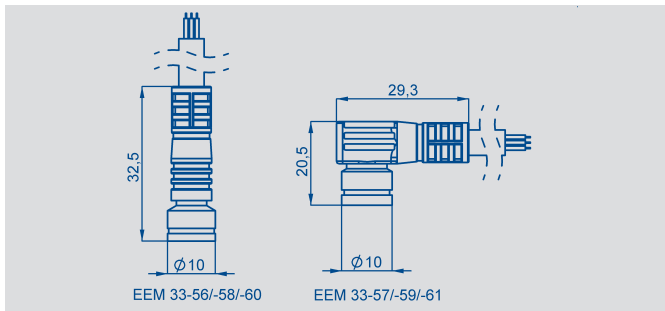


Type designations	LS1 0025	LS1 0050	LS1 0075	LS1 0100	LS1 0150	LS1 0200	
<b>Electrical Data</b>							
Electrical measuring range	25	50	75	100	150	200	mm
Absolute linearity	≤ ± 0.1	≤ ± 0.15					% F.S.
Tolerance of electr. zero point	± 0.5						mm
Output signal voltage or current	0.1...10 VDC (by load 470 kΩ) allowed load ≥ 10 kΩ 10...0.1 VDC (by load 470 kΩ) allowed load ≥ 10 kΩ 4...20 mA (burden ≤ 500 Ω) 20...4 mA (burden ≤ 500 Ω)						
Internal resistance of voltage output	120						Ω
Output, short-circuit-proof	against supply max. ... 30 VDC and GND (permanent)						
Update Rate	high speed mode ≥ 950; low speed mode ≥ 50						Hz
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						mV mV μA μA
Supply voltage	16...30						VDC
Supply voltage ripple	max. 10						% V <sub>ss</sub>
Power drain without load	< 1						W
Temperature coefficient	≤ 50						ppm/K
Overvoltage protection	< 40 (permanent)						VDC
Polarity protection	up to U <sub>max</sub>						VDC
Insulation resistance (500 VDC)	≥ 10						MΩ
<b>Mechanical Data</b>							
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 fixing screws	140						Ncm
<b>Environmental Data</b>							
Operating temperature range	-40...+85 with connector -30...+100 with cable						°C °C
Operating humidity range	0...95 (no condensation)						%RH
Shock per DIN IEC	100 (11 ms) (single hit)						g
Vibration per DIN IEC	20 (10...2000 Hz, A <sub>max</sub> 0.75 mm)						g
Protection class	IP 40 DIN EN 60529						
Adjustment speed max.	5						m/s
Acceleration speed max.	5						g
Life	> 100x10 <sup>6</sup>						movements
MTTF (ISO 13849-1, parts count method, w/o load)	24						years
<b>CE-Conformity</b>							
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						

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 Subject to  
 changes.  
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#### 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,  
 Art.No. 059010;  
 PUR-cable with 3-pin female  
 connector, M8 x 1,  
 3 x 0.25 mm<sup>2</sup>, 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 mm<sup>2</sup>, 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

Preferred types printed in bold

Electrical interface  
**4: Analog interface**

Output signal analog interface 4 \_ \_

**1: Voltage output**  
**2: Current output**

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

Analog interface current 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)

Electrical connection

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

**L S 1 - 0 2 0 0 - 0 0 1 - 4 1 1 - 1 0 1**

Series

Electrical measuring range  
 Various standard lengths  
 from 0025 mm up to 0200 mm

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

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