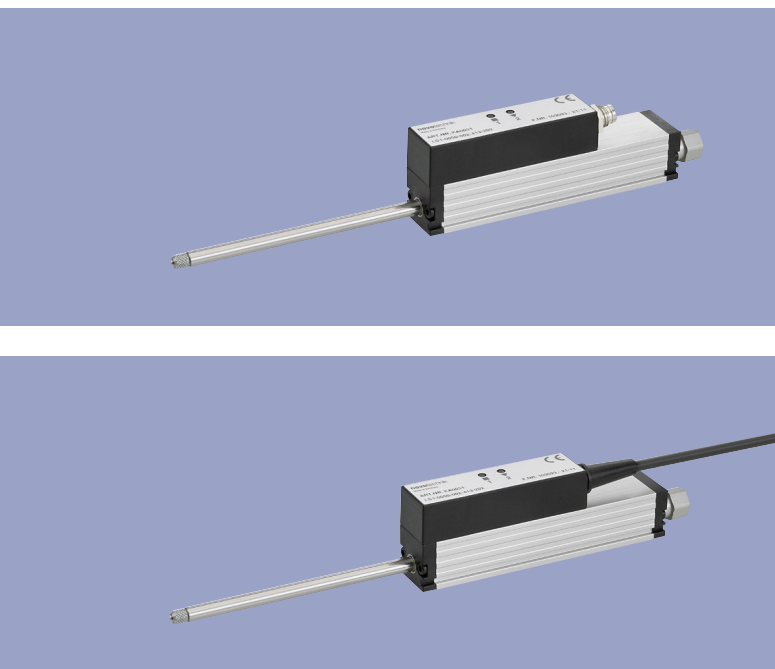


NOVOPAD
Position Transducer
with return spring
up to 100 mm
non-contacting
Series LS1
with analog interface



Position transducer with return spring, 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.

The design of the rear end stop nut on the push rod simplifies the connection of actuators like pneumatic cylinders and solenoids.

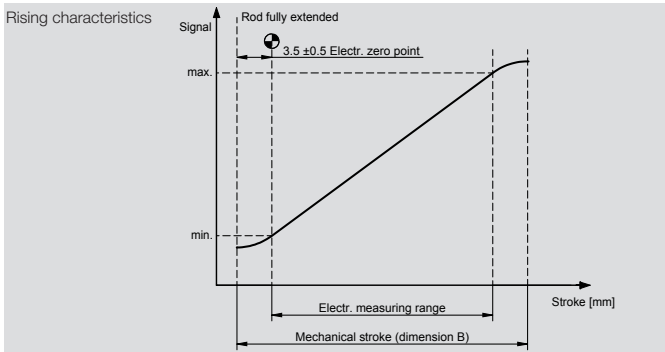
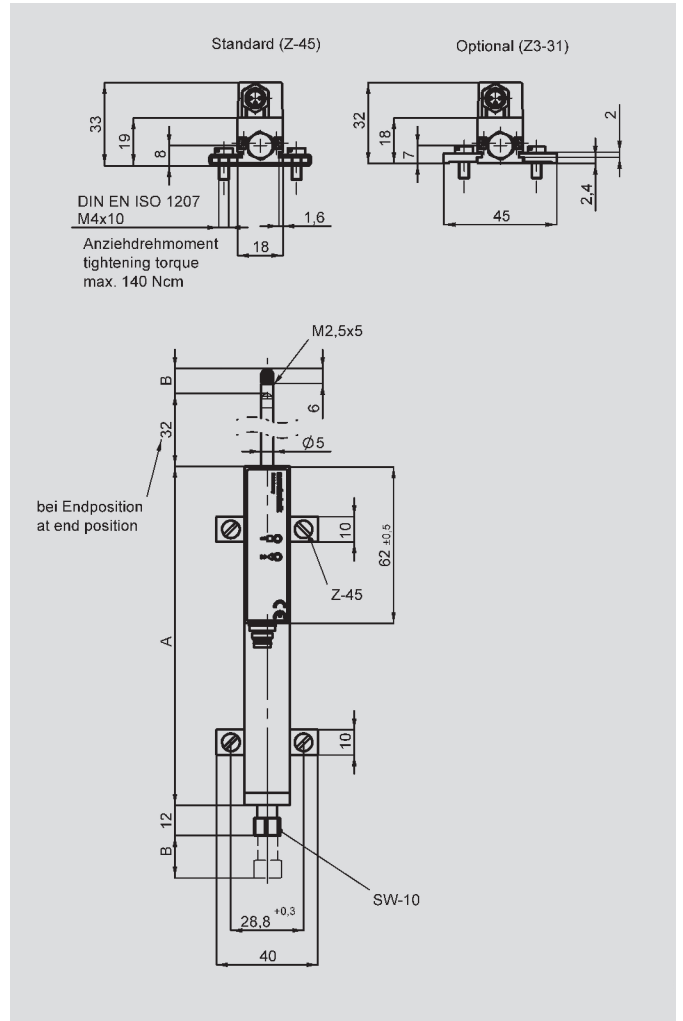
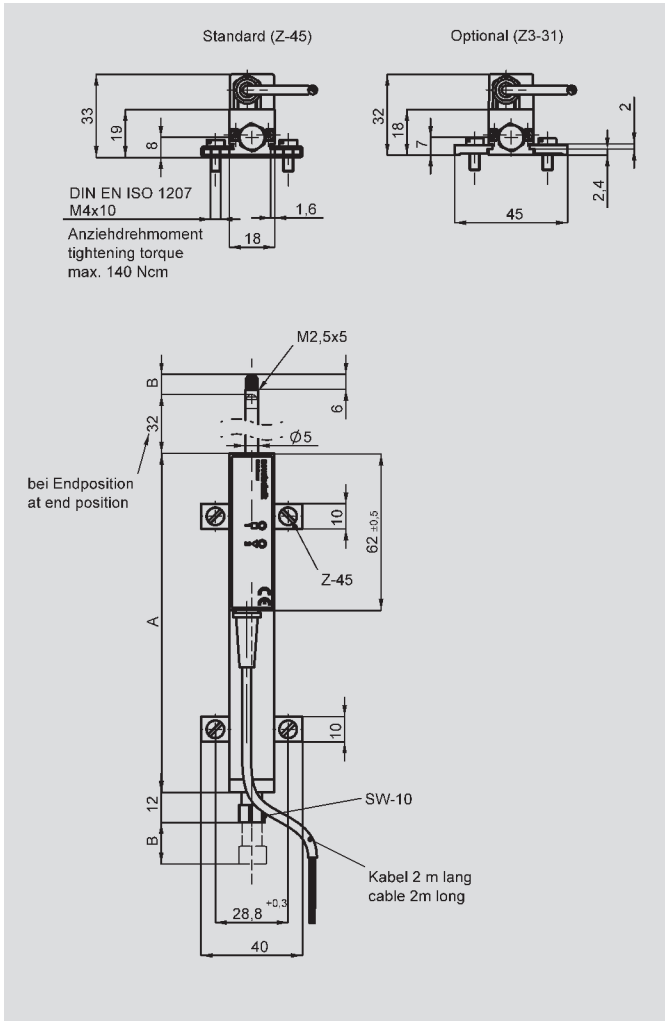
The integrated signal processor with programmable end-points (Teach-in) function provides an absolute and proportional voltage or current output signal. The LS1 uses a non-contacting technology, and is maintenance and wear free. The transducers provide optimal reproducibility, resolution and linearity.

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

Special features

- long life, up to 100 million movements, depending on application
- outstanding linearity $\pm 0.15\%$
- 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

Description	
Housing	Aluminium, anodized
Mounting	adjustable clamps
Actuating rod	stainless steel, AISI 303, with anti-rotation safeguard, internal thread M2.5x6
Probe tip	stainless steel with external thread M2.5 and pressed-in hardened metal ball
Bearings	both ends in metal-polymer glide bearings
Measurement principle	NOVOPAD inductive
Electrical connections	3-pin round connector, shielded, M8 x 1 3-wire PVC-cable, 3x 0,14 mm ² , shielded 2 m length
Electronic	SMD with ASIC, integrated



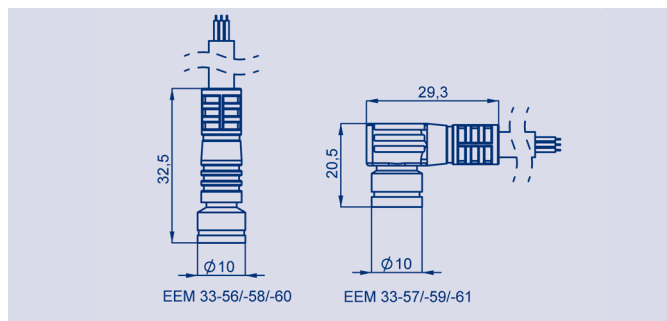
Type designations	LS1 0025	LS1 0050	LS1 0075	LS1 0100	
Electrical Data					
Electrical measuring range	25	50	75	100	mm
Absolute linearity	< ± 0.1	< ± 0.15			% FS
Tolerance of electrical zero point	± 0.5				mm
Output signal voltage or current	0.1 ... 10 VDC (load 470 kΩ) allowed load > 10 kΩ 10 ... 0.1 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	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				
Supply voltage Ub	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	94.4	134.4	166	+1 mm
Mechanical stroke (dimension B)	30	55	80	105	±1.5 mm
Weight approx.					
with cable	120	150	180	200	g
with connector	86	107	132	150	g
Operating force (horizontal)	≤ 2.5				N
Operating force retracted (horizontal)	≤ 5.0				N
Operating force to end stop	max. 5				N
Operating frequency max.	18	14	11	10	Hz
Maximum permitted tightening torque for mounting screws	140				Ncm
Environmental Data					
Operating temperature range	-40 ... +85 with connector -30 ... +100 with cable				°C
Operating humidity range	0 ... 95 (no condensation)				% RH
Shock IEC 60068-2-27	100 (11 ms) (single event)				g
Vibration IEC 60068-2-6	20 (10 ... 2000 Hz, Amax = 0.75 mm)				g
Protection class DIN EN 60529	IP40				
Operating velocity maximum	5				m/s
Operating acceleration maximum	5				g
Life	> 100x10 ⁶				movements
MTTF (IEC 60050)	81				years
Functional safety	If you need assistance in using our products in safety-related systems, please contact us				
EMC-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				

FS = Full scale: Signal span according to electrical measuring range

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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: 0.1 VDC ... 10 VDC (high speed mode)
 2: 10 VDC ... 0.1 VDC (high speed mode)
 3: 0.1 VDC ... 10 VDC (low speed mode)
 4: 10 VDC ... 0.1 VDC (low speed mode)

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

Electrical connection

- 101: Connector M8x1, 3-pin, axial outlet
- 202: Cable, 3-pole, L = 2 m, axial outlet

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

Mechanical version
002: Position transducer with return spring

Electrical measuring range
Various standard lengths
from 0025 mm up to 0100 mm

Series

Included in delivery

- 2 mounting clamps Z-45 incl.
- 4 cylinder screws M4x10,
- 1 probe tip with pressed-in hardened metal ball

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;
- roller head Z-R50.

On request available

Customized length and electrical connection e.g. cable with connector.

Output connector Code 101	Cable Code 202	Connector with cable EM 33-56 /-57 /-58 /-59 /-60 /-61	Signal
Pin 1	GN	BN	Supply voltage U _b
Pin 4	WH	BK	Output signal
Pin 3	BN	BU	GND