DATASHEET



SLX SERIES | LVDT

Perfectly adapted to the environmental conditions in pharmaceutical, medical and food industry applications.

- Measurement ranges 10...300 mm
- Linearity up to ±0,10 % of full scale
- High protection class IP68/IP69K
- Sensor working temperature up to 200 °C
- High resistance to aggressive media
- Customized versions available

eddylab

LVDTs (Linear Variable Differential Transformers) are inductive sensors excellent for use in harsh industrial environments, e.g. high temperature and pressure ranges,as well as high accelerations and measuring cycles.

The **SLX-series** is based on the rugged SL-series and is perfectly adapted to the environmental conditions in pharmaceutical, medical and food industry applications. Today CIP and SIP („clean in place“, „sterilisation in place“) are state-of-the-art processes to ensure a hygienic production, starting from grade „clean“ up to „aseptic“. Therefore all interior surfaces and parts of the machines will be cleaned using aggressive mediums at high temperatures and pressure. The SLX-series is built to withstand these challenging conditions and guarantuees highest reliability and life-time.

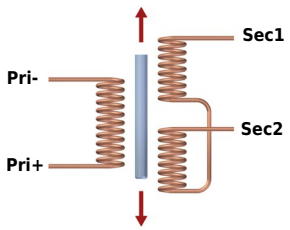
Note: A measuring amplifier is required to operate LVDT sensors. eddylab offers the digital signal conditioners **DEEneo** for DIN rail mounting and **DEEneo-ISC**, a version integrated into the sensor connection cable. See p.5 or separate data sheets at www.eddylab.com.
The electronics take over the sensor supply and convert the sensor signal into a standardized, analogue output signal with the help of a microcontroller. They also feature simple adjustment (teach function) and linearization of the sensor characteristic curve to achieve the highest possible precision.

TECHNICAL DATA - SENSORS

SENSOR								
Measurement range [mm]	0...10	0...25	0...50	0...80	0...100	0...150	0...200	0...300
Linearity [% of range]	0,30 %, optional 0,20 %, 0,10 % for selected models							
Type	free core, push rod guided/ unguided, rod end bearings							
Protection class	IP68 / IP69K							
Vibration stability DIN IEC68T2-6	10 G							
Shock stability DIN IEC68T2-27	200 G/ 2 ms							
Supply voltage/ frequency	3 V_{eff}/ 3 kHz							
Supply frequency	2...10 kHz							
Temperature range	-40...+150 °C (option H200 up to 200 °C)							
Mounting	ø 20 mm clamp diameter or rod end bearings							
Housing	stainless steel 1.4571 / 1.4301							
Connection	4 core shielded cable							
PTFE	material FEP, ø 4,8 mm, 4x0,24 mm², max. temperature 205 °C, UL-Style 2895, 200 °C/300 V							
cable length	2 / 5 / 10 m							
Free core/ push rod/ rod end bearings								
Max. acceleration of core/ push rod	100 G							
Life cycle	infinite							
Weight (approx., without cable) [g]	125	150	230	290	320	360	420	550

PIN ASSIGNMENT (AC OUTPUT)

	WIRE COLOUR OF EDDYLAB CABLES
FUNCTION	PTFE-UL CABLE
Primary +	white
Primary -	yellow
Secondary 1	brown
Secondary 2	green



CHEMICAL RESISTANCE

MEDIUM	CONCENTRATION [%]	TEMPERATURE [°C]	RESISTANCE
acetic acid + hydrogen peroxide	10 and 50	20	•
		50	•
		90	•
ammoniac			•
ammonium chloride	10	boiling	•
	25	boiling	•
ammonium hydroxide	any	20	•
		boiling	•
caustic soda	25	20	•
		boiling	•
citric acid	up to 10	20	•
		boiling	•
	up to 50	20	•
	5 (3 bar)	140	•
formic acid	10	20	•
		70	•
	100	20	•
hydrogen peroxide	up to 2	90	•
	10	20	•
hypochloric acid	0,5	20	•
nitric acid	7	20 or boiling	•
	10	20 or boiling	•
	25	20 or boiling	•
	37	20 or boiling	•
	50	20 or boiling	•
	66	20 or boiling	•
peracetic acid	6	60	•
phosphoric acid	1	20	•
		boiling	•
	10	20	•
		boiling	•
	45	20	•
	60	20	•
	70	20	•
	80	20	•
	concentrated	20	•
saltwater *	-	20	•
sodium hypochlorite	5	20	•
		boiling	•
steam	-	up to 150	•
steam with SO2 / CO2			•
sulphuric acid	1	20	•
		70	•
		boiling	•
	up to 7,5	20	•
		70	•
	up to 98 %	20	•

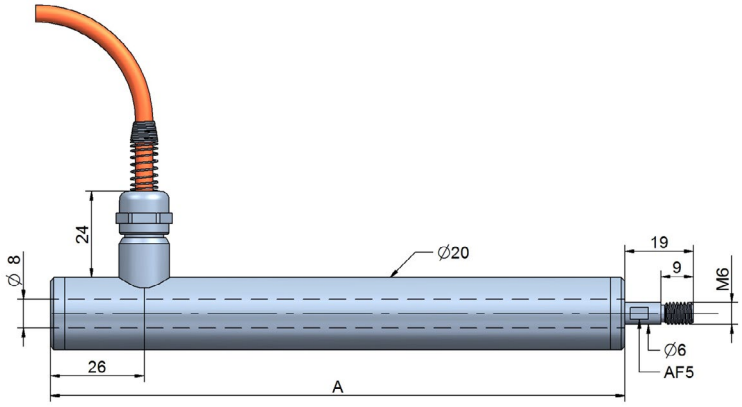
* possible pitting corrosion

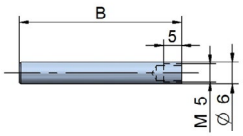
Information about further chemicals on request.

TECHNICAL DRAWINGS

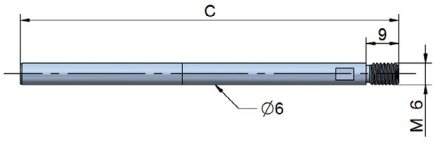
RANGE (FS) [MM]	BODY LENGTH A [MM]	CORE LENGTH B [MM]	PUSH ROD LENGTH C [MM]
0...10	79	30	78
0...25	114	45	107,5
0...50	159	70	155
0...80	219	100	215
0...100	259	120	255
0...150	359	160	345
0...200	459	220	455
0...300	659	320	655

TYPE: FREE CORE, PUSH ROD, PUSH ROD GUIDED



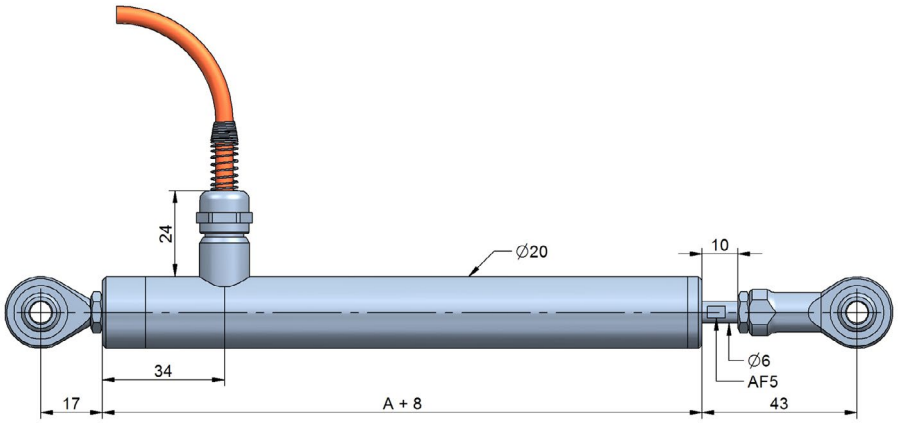


core

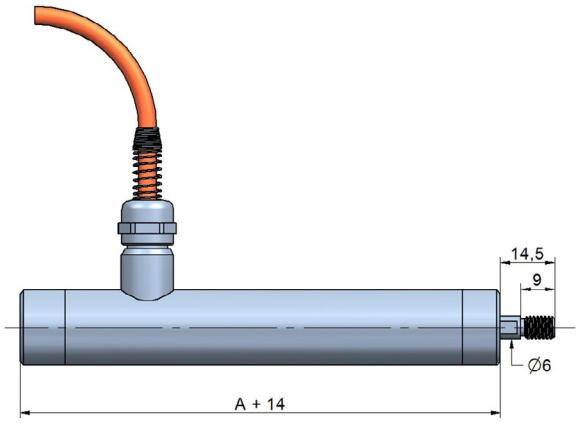


push rod

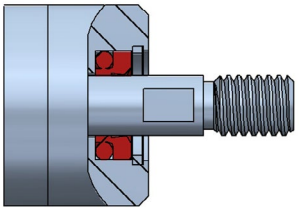
TYPE: ROD END BEARINGS



OPTION: WIPER



Sensors with guided push rod (type „SG“) or rod end bearings („G“) can be equipped with a double wiper ring that combines wiping and sealing to prevent the penetration of dust, dirt and metal swarf and fluids into the sensor. The displacement speed of the push rod is limited to 4 m/s.

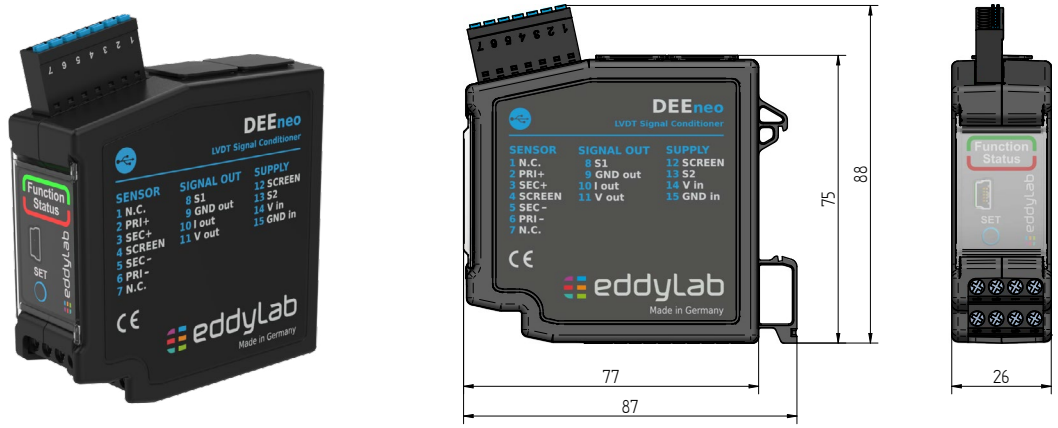


DEENEO | DEENEO-ISC

The **DEEneo** signal conditioner was developed for operating inductive LVDT sensors (full bridge). The electronics supply the sensor and convert the sensor signal into a standardized, analogue output signal with the help of a microcontroller. A push button (SET button) is used for the basic configuration and to set the measuring range limits - this enables quick and easy adaptation to the customer's application. Where possible, eddylab calibrates the sensor and electronics together. The sensor characteristic curve can be linearized to meet the highest demands on the accuracy of the measuring chain. Further features can be configured via the **eddySETUP** configuration software. Further information can be found in the DEEneo and DEEneo-ISC data sheets.

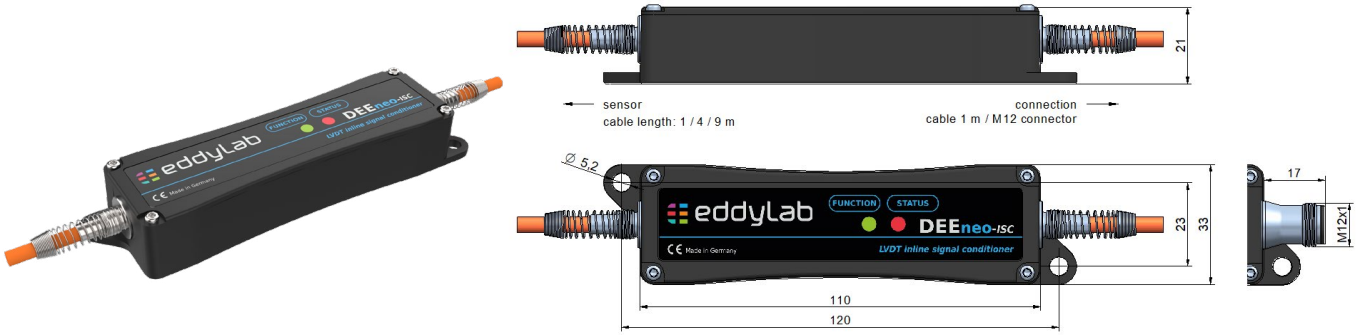
DEEneo*

Digital signal converter for DIN rail mounting



DEEneo-ISC*

Inline Signal Conditioner (cable electronics)



TECHNICAL DATA

ELECTRONICS	DEEneo*	DEEneo-ISC*
Current output signal	configurable in the range -20...+20 mA (e.g. 4...20 mA)	
Voltage output signal	configurable in the range -10...+10 V (e.g. 0...10 V)	
Mounting	on 35 mm DIN rail in accordance with DIN EN 60715	integrated in sensor cable
Power supply	9...36 VDC	
Power consumption	70 mA at 24 VDC, 130 mA at 12 VDC	
Sensor supply	configurable: 0...5 Vrms differential; 1...10 kHz (standard: 3 Vrms / 3.3 kHz)	
Resolution	16 bit	
Signal processing	digital via microcontroller	
Signal adjustment	via SET-button or software	
Linearisation of sensor	yes, optionally possible	
Features		
Switching output	open drain up to 60 V, max. 115 mA	-
Alarm output	open drain up to 60 V, max. 115 mA	-
Cable break detection	configurable (standard: enabled)	

*Separate data sheets for DEEneo and DEEneo-ISC at www.eddylab.com

ORDER CODE SENSOR

SLX X (a) – X (b) – X (c) – X (d) X (e) X (f) X (g)

a measurement ranges [mm]
10 / 25 / 50 / 80 /
100 / 150 / 200 / 300 /

b type
A = free core
S = unguided push rod
SG = guided push rod
G = rod end bearings

c cable
KR = radial cable

d cable length / type

S2: sensor with cable output, open cable end for DEEneo
D = PTFE-UL cable 2 m
E = PTFE-UL cable 5 m
F = PTFE-UL cable 10 m

S3: sensor with cable output for DEEneo-ISC
K = PTFE-UL cable 2 m
L = PTFE-UL cable 5 m
M = PTFE-UL cable 10 m

e linearity
1 = 0,30 % (standard)
2 = 0,20 % (option L20)
3 = 0,10 % (option L10)

f temperature range
1 = -40...+150 °C (standard)
2 = -40...+200 °C (option H200)

g push rod sealing
1 = - (standard)
2 = wiper ring (option W)

ORDER CODE ELECTRONICS

DEEneo – X (a)

DEEneo-ISC – X (a) – X (b)

type
DEEneo = external electronics
DEEneo-ISC = inline signal conditioner

a output signal
020A = 0...20 mA
420A = 4...20 mA
10V = 0...10 V
5V = 0...5 V
±5V = -5...5 V
±10V = -10...10 V

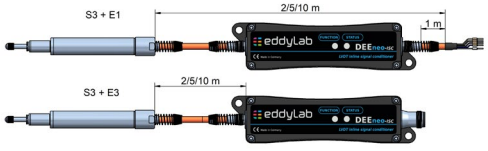
b type of cable / length

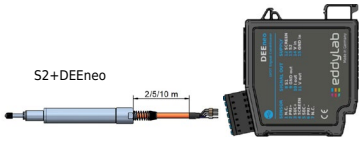
E1: for sensor with cable output
- = integrated in sensor cable

E3: for sensor with cable output
M12 = integrated in sensor cable, M12 connector

possible combinations:

- S3+E1: sensor with cable output, DEEneo-ISC integrated in sensor cable
- S3+E3: sensor with cable output, DEEneo-ISC integrated in sensor cable, M12 connector
- S2+DEEneo: sensor with cable output, electronics DEEneo







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