LVDT

Inductive Position Transducer

Series
SL ø20 mm

- ranges 50...600 mm
- linearity 0,30 % (0,20 % on request)
- ø 20 mm
- output: AC, 0...10 V, 0...5 V, 4...20 mA, 0...20 mA, ±10 V, ±5 V
- with external or integrated cable electronics
- rugged stainless steel housing
- diameter push rod: 8 mm
- temperature -40...+120°C (150°C on request)
- customised version available

Technical data

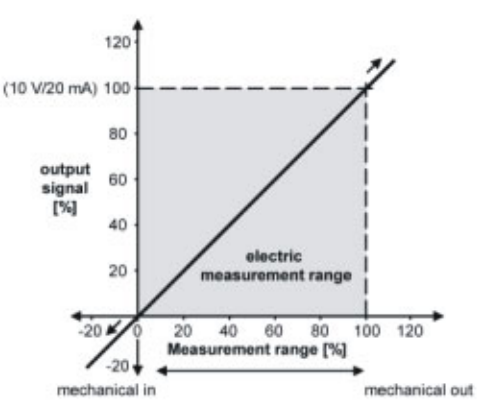
sensor							
range [mm]	0...50	0...80	0...100	0...150	0...200	0...300	0...600 (on request)
linearity	0,30 % (0,20 % optional)						
types	free core, push rod guided/unguided, rod end bearing						
bearing material	Iglidur bearing						
protection class	IP65 or IP68/10 bar						
vibration stability DIN IEC68T2-6	10 G						
shock stability DIN IEC68T2-27	200 G/ 2 ms						
supply voltage/ frequency	3 Veff/ 3 kHz						
supply range	0,5...8 Veff						
supply frequency	2...10 kHz						
temperature range	-40...+120°C (150°C optional)						
mounting	ø 20 mm clamp diameter or rod end bearings						
connection	4 core TPE-cable / PTFE cable (Option H) or M12-connection, coupling nut						
housing	stainless steel 1.4301						
cable -TPE (standard)	ø 4,5 mm, 0,14 mm², non halogen, suitable for drag chains						
-PTFE (optional)	ø 3,7 mm, 0,24 mm², max. temperature 205°C						
max. cable length	100 m between sensor and IMA external electronics						
free core/ push rod							
max. acceleration of core/ push rod	100 G						
life time	infinite						
weight (without cable) [g]	230 g	290 g	320 g	360 g	420 g	550 g	670 g

Electronics	**IMA external electronics (built-in)**	**KAB cable electronics**
output signal	0...20 mA, 4...20 mA (load <500 Ohm)	0...20mA, 4...20mA (load <100 Ohm)
	0...5 V, ±5 V (load >5 kOhm)	0...5 V, ±5 V (load > 5kOhm)
	0...10 V, ±10 V (load >10 kOhm)	0...10 V (load >10kOhm)
temperature coefficient	zero 150 ppm/ °C, max. value 400 ppm/ °C	460ppm/ °C
ripple	< 20 mVeff	< 20 mVeff
max. frequency	300 Hz/ -3 dB (Butterworth 5'th rang)	-
adjustment range	offset ±20%, gain ±50%	-
isolation resistance	> 1 GOhm at 500 VDC	-
isolation stability	supply <> signal 500 VDC	-
power supply	24 VDC (18...36 V) or 15 VDC (9...18 V)	24 VDC (18...36 V) or 15 VDC (9...18 V)
current consumption	<150/80 mA with/without load (supply 24 VDC) <300/100 mA with/without load (supply 15 VDC)	65 mA (24 VDC), 140 mA (12 VDC)
sensor supply	3 Veff, 3 kHz	3,0 Veff (15...26V supply) 2,4 Veff (12...20V supply)
working temperature	0...+60°C	0...+60°C
storage temperature	-20...+80°C	-20...+80°C
housing	meets UL94-VO	aluminium
mounting	on DIN rail	none

The output signal is referring to the electric measuring range. If the sensor is operated outside the measuring range or the measuring range is exceeded, then the signal is also outside the defined range (i.e. >10V/ 20mA or <0V/ 4mA, in the graph: >100% or <0%).

Please keep this in mind for control systems with cable break detection lower than 4 mA or for a maximum input voltage >10 V of measuring instruments. If necessary install the sensor **before** connecting to the plc.

Running direction of signal: If the push rod is moving into the sensor, then the signal is reducing. If the push rod is moving out, then the output signal is increasing. The running direction of the signal can also be inverted.

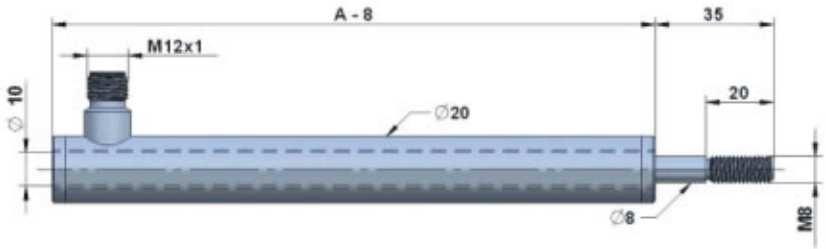


Technical Dimensions

range (FS) [mm]	body length A [mm]	core length B [mm]	push rod length C [mm]
0...50	187	70	177
0...80	247	100	237
0...100	287	120	277
0...150	387	170	377
0...200	487	220	477
0...300	687	320	677
0...600	905	240	657

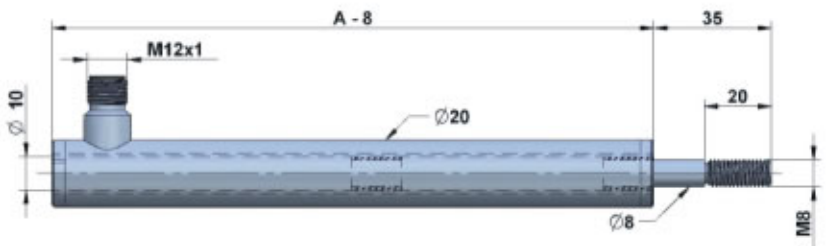
Other measurement ranges on request.

free core or unguided push rod



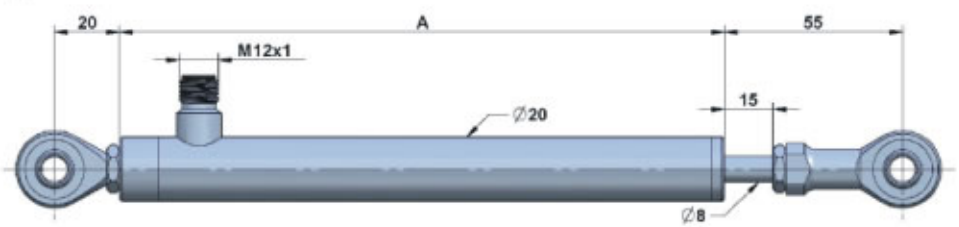
core, push rod

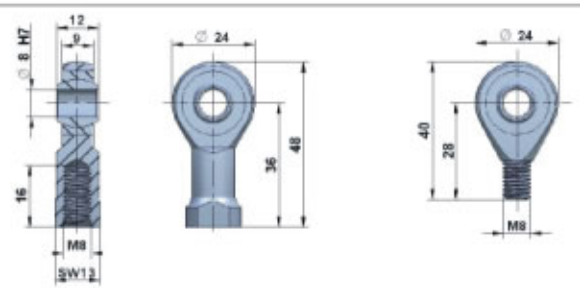
push rod guided



push rod double bedded (Iglidur bearing), push rod extricable

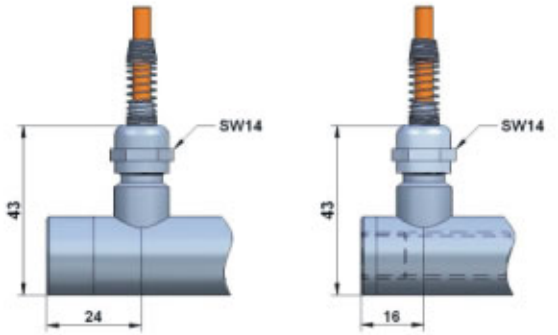
rod end bearing





Cable outputs

radial cable output



Sensors with cable output have a cable fitting and a spring for bend protection of the cable.

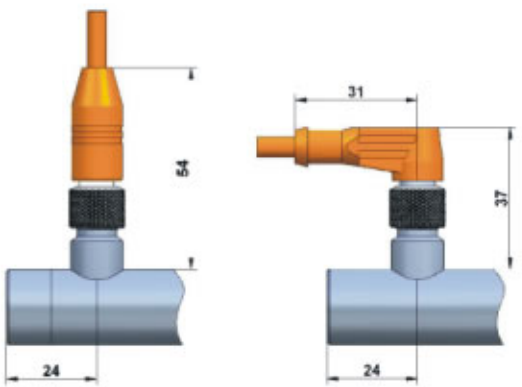
For installation, the bending radius should not be less than 3 times the cable diameter. The standard cable length is 2 m.

Instruments with option H for temperatures up to 150°C feature a PTFE cable.

Sensors have a through hole. Please use this type for application at heavy dirt exposure. The movement of the push rod removes the dirt from the sensor and conveys it to the rear. The standard cable length is 2m.

Depending on the application the sensor can - on request - be supplied with a closed rear end body (without additional charge). Please specify that in your order.

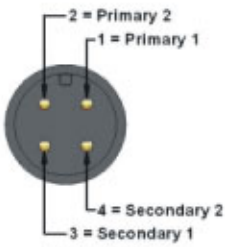
connector output (cable with straight or angular connector)



For sensors with a connector output the cable has to be ordered separately. Cables with a straight connector, as well as cables with angular connectors are available.

The connector is protected from accidental removal by a threaded fitting (M12). The cable lengths are 2/ 5/ 10 m.

The connector pair has protection class IP65.



Connector pin assignment

Adjustment of zero point and amplification of the electronics

Please note that zero point and amplification may shift for long cable lengths between sensor and electronics. Thus install the sensor with the according line length to the electronics and then adjust zero point and amplification.

1. Push rod entirely in - adjust offset:

Move the sensor to the zero point of the measuring range and set the offset potentiometer on 0 mA, i.e. 0 V for the output signal.

2. Push rod entirely out - adjust amplification:

Move the sensor to the mechanical end point (push rod moved out) and set the amplification potentiometer on 16 mA/ 10 V/ 5 V for the output signal.

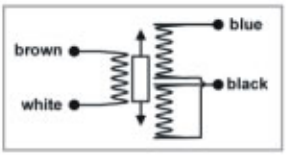
3. Adjust offset (4...20 mA output)

Set the offset potentiometer on 20 mA (+4 mA) for the output signal.

Signal inversion

If an inverted output signal is required (20...4 mA/ 10...0 V/ 5...0 V), then swap clamps 6 and 8 (secondary coil) on the external electronics.

AC-output



wiring diagram:

white (5):	Primary 2
black (6):	Secondary 2
brown (9):	Primary 1
blue (8):	Secondary 1

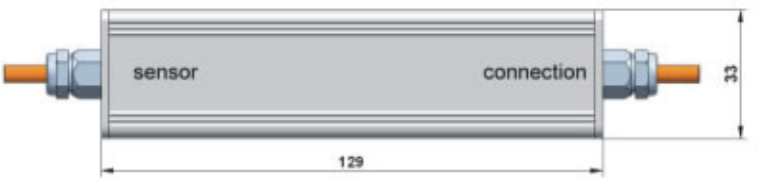
wiring diagram for PTFE-connection:

white (5):	Primary 2
green(6):	Secondary 2
yellow (9):	Primary 1
brown (8):	Secondary 1

Cable electronics KAB

cable length:
electronics to sensor
1 m, 4 m or 9 m

cable length 1 m



If not specified otherwise the cable electronics is situated at 1 m from the end of the cable. On request in your order, however, the cable electronics is available at any distance.

wiring diagram:

brown:	supply V+
blue:	GND
black:	output GND
white:	output signal

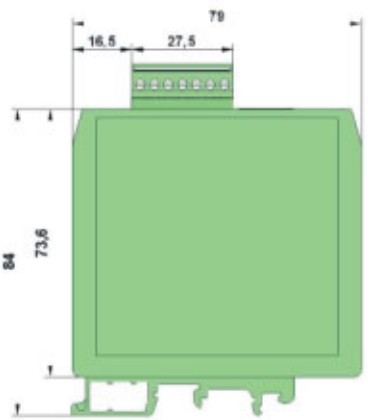
wiring diagram for PTFE-connection:

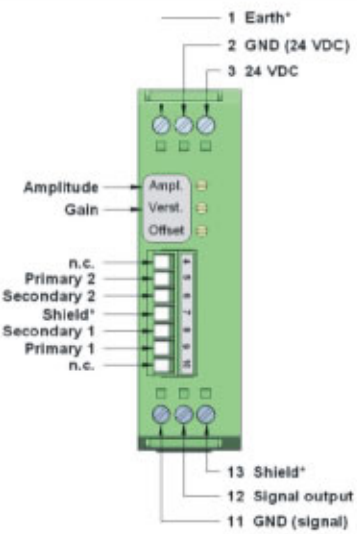
yellow:	supply V+
brown:	GND
green:	output GND
white:	output signal

External electronics IMA

external electronics IMA
(for DIN rail mounting)

dimensions:



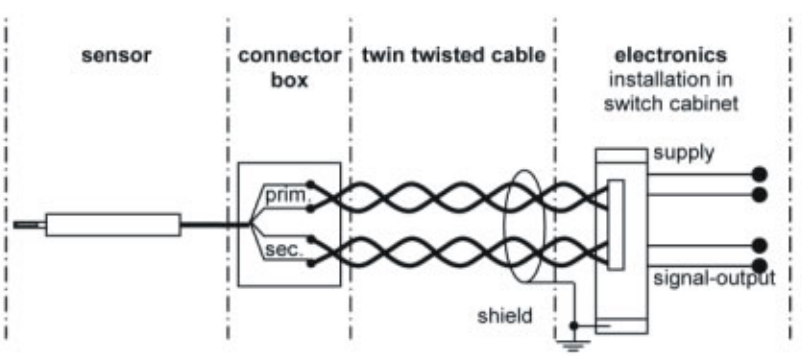


Connection

The external electronics IMA2-LVDT is designed to be installed in switch cabinets (DIN-rail mounting). The connection to the sensor is conducted as connector with screw clamps.

* Clamps 1, 7 and 13 are internally connected.

At harsh EMC environments, it is possible to install the electronics at a max. distance of 100 m in a switch cabinet. A twin twisted pair cable (4-cores, minimum cross section 0,5 mm²), single or double shielded, is to be used for the further wiring to connect the external electronics to the system. It is recommended to ground the shield in the switch cabinet near the electronics (do not ground at the machine/ sensor). The sensor housing is grounded at the machine frame. To prevent interference, the cable length should not exceed 100 m.



Order code

SL □ – □ – □ – □

range [mm]	
0...50	50
0...80	80
0...100	100
0...150	150
0...200	200
0...300	300
0...600 (on request)	600

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

-	IP65
IP68	(not SR) IP68
H	(not SR) temp. 150°C
L20	improved linearity 0,20%

KR	cable output radial
SR	connector output radial

□ – □ – □

external electronics	IMA-3A
cable electronics	KAB

voltage supply	
12 VDC	12V
24 VDC	24V

	output
020A	(not KAB) 0...20 mA
420A	4...20 mA
10V	0...10 V
5V	0...5 V
±5V	± 5 V
±10V	± 10 V

Connector cable:

cable with straight connector M12 (SA)

K4P2M-S-M12	2 m
K4P5M-S-M12	5 m
K4P10M-S-M12	10 m

cable with angular connector M12 (SA)

K4P2M-SW-M12	2 m
K4P5M-SW-M12	5 m
K4P10M-SW-M12	10 m

fixed connector cable (2,0 m standard, KA, KR):
additional metre of TPE-cable
additional metre of PTFE-cable (-H)

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