

INDUCTIVE SENSOR LVDT

Links to further documents for this series:

[Installation guide](#)

[Calibration Instructions LVA](#)

[Data sheet TEDS connector](#)



LV SERIES

Key-Features:

- Spring loaded or guided rod
- Optional with ball-joints
- Measurement ranges 2, 5, 10 and 25 mm
- Linearity up to $\pm 0.1\%$
- Resolution up to $1\ \mu\text{m}$
- Output with external electronics: 0...10 V, 4...20 mA
- Protection class up to IP67
- Operating temperature: -40...+120 °C, optional -40...+200 °C
- Optional with TEDS connector

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TECHNICAL DATA SENSOR LV

Measurement range MR	[mm]	2	5	10	25
Linearity ¹⁾	[%]	±0.2			
Improved linearity (optional) ¹⁾	[%]	±0.1			
Resolution	[µm]	0.8	1		
Sensitivity	[mV/V/mm]	68	74	64	41
Calibrated at		3 V _{RMS} / 5 kHz			
Excitation voltage	[V _{RMS}]	1...10			
Excitation frequency	[kHz]	2...10			
Connection		connector output M12, axial or cable output, axial (TPE cable, standard length 2 m)			
Cable length to electronics max.	[m]	100			
Protection class		versions without bellow (T / S / G): IP65 version with bellow (TF): IP67			
Operating temperature	[°C]	-40...+120 (version with 5 pole connector up to +85) / optional: -40...+200 ²⁾			
Temperature coefficient ¹⁾	[%/K]	±0.02			
Versions ³⁾		spring-loaded rod with bellow (TF) or without bellow (T), guided rod (S), guided rod with ball joints (G)			
Spring force MR centre (version TF)	[N]	1.5	1.7	-	
Spring force MR centre (version T)	[N]	1.4	1.5	1.6	1.5
Spring constant (version TF)	[N/mm]	0.15			-
Spring constant (version T)	[N/mm]	0.12			0.09
Motion frequency (1 mm stroke)	[Hz]	max. 100		max. 70	max. 25
Mounting	[mm]	clamping shaft: Ø 8 h6 or housing: Ø 12			
Housing		nickel-plated steel			
Weight (without cable)	[g]	50	55	60	80
Weight version G (without cable)	[g]	90	95	100	120

¹⁾ Based on the measurement range

²⁾ Not available with connector output, 5 pole cable output or bellow. Changed cable output with PFA cable see „Options“ page 5.

³⁾ Versions with guided rod (S) or ball joints (G) are protected against falling out of the rod. Version with bellow (TF) not available for measurement range 25 mm.

⁴⁾ Versions with spring-loaded rod (TF and T) only

TECHNICAL DATA ELECTRONICS

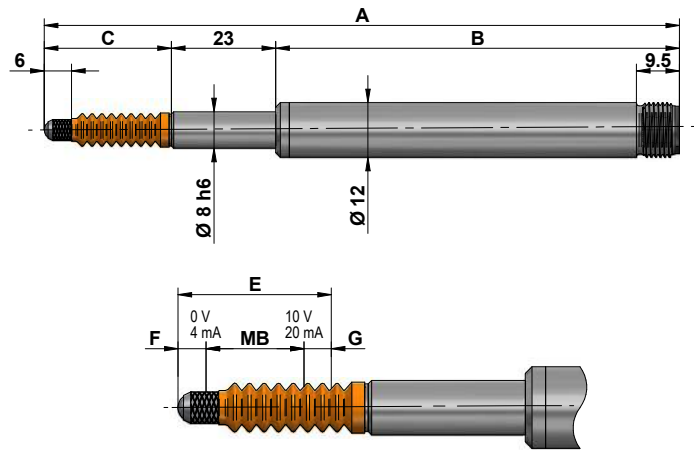
		DIN rail electronics LVA	Cable electronics LVC ¹⁾
Output		0...10 V / 4...20 mA	
Linearity ¹⁾	[% F.S.]	<±0.01	
Noise	[mV _{RMS}]	<20	<5 (DC...20 MHz)
Supply	[VDC]	18...36	24 ±10 %
Current consumption (without load)	[mA]	<80 (at 24 V) / <100 (at 18 V)	<80 (at 24 V)
Isolation voltage	[VDC]	500	
Isolation resistance		1 GΩ at 500 VDC	
Cut-off frequency		max. 10 % of excitation frequency	
Sensor supply	[V _{RMS}]	3	4
Carrier frequency	[kHz]	5	
Protection class		IP40	
Operating temperature	[°C]	-25...+85	
Storage temperature	[°C]	-25...+85	
Temperature coefficient sensitivity	[% F.S./K]	<±0.04	<±0.02
Temperature coefficient zero point	[% F.S./K]	<±0.015	<±0.01
Mounting		DIN rail	2 x mounting holes M3
Housing		Polyamide PA6.6	Aluminium anodised

¹⁾ Available for a measurement range up to 10 mm.

²⁾ To achieve an optimal measuring result, it is recommended to power up the electronics for 10 minutes before the measurement.

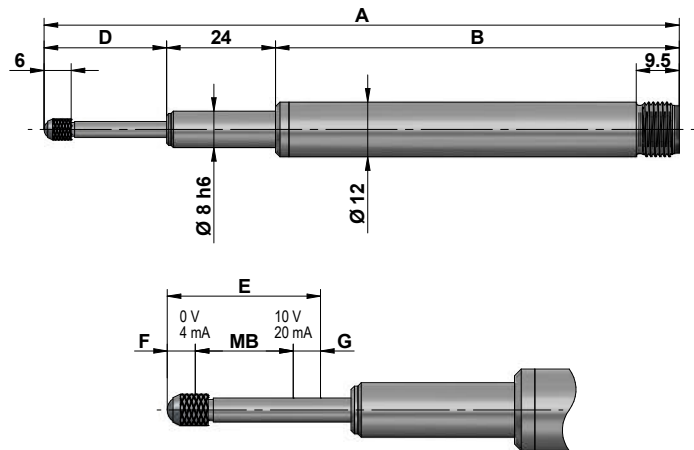
TECHNICAL DRAWING SENSOR LV

Version with bellow (TF)



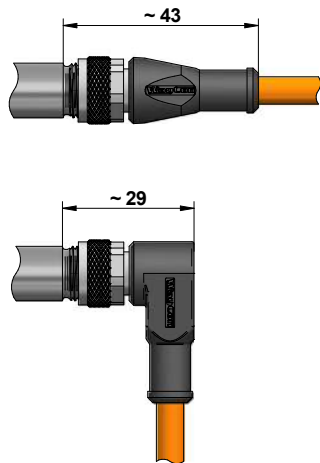
Measurement range	MB	2	5	10
Total length	A	113	126	140
Housing length	B	69	79	89
Rod outer position	C	21	24	28
Total stroke	E	5	8	12
Start stroke approx.	F	1.5	1.5	1
End stroke approx.	G	1.5	1.5	1

Version without bellow (T and S)

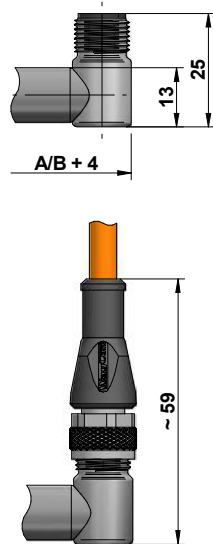


Measurement range	MB	2	5	10	25
Total length	A	113	126	140	191.5
Housing length	B	69	79	89	132.5
Rod outer position	D	20	23	27	36
Total stroke	E	5	8	12	29
Start stroke approx.	F	1.5	1.5	1	2
End stroke approx.	G	1.5	1.5	1	2

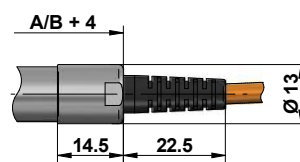
Connector output, axial



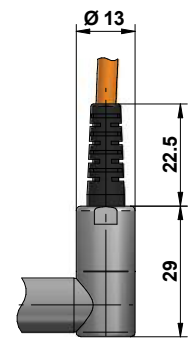
Connector output, radial



Cable output, axial

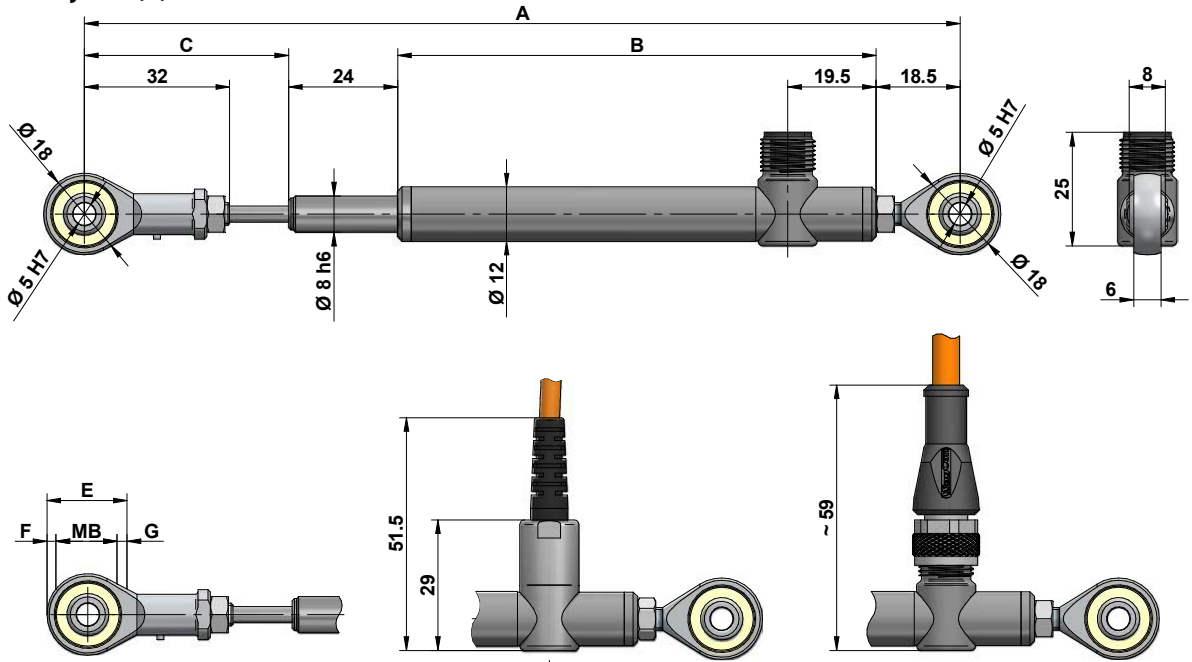


Cable output, radial



TECHNICAL DRAWING SENSOR LV

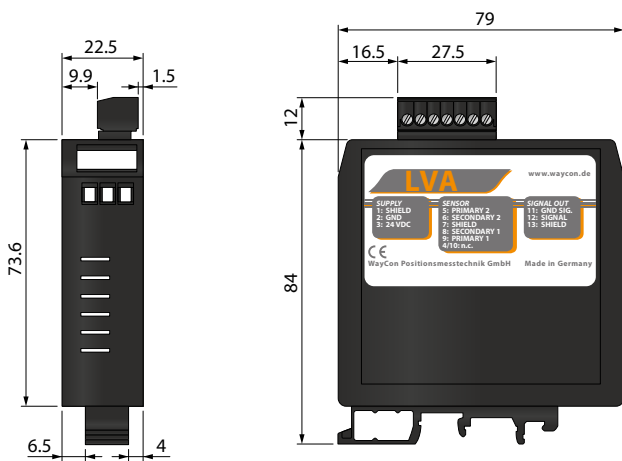
Version with ball joints (G)



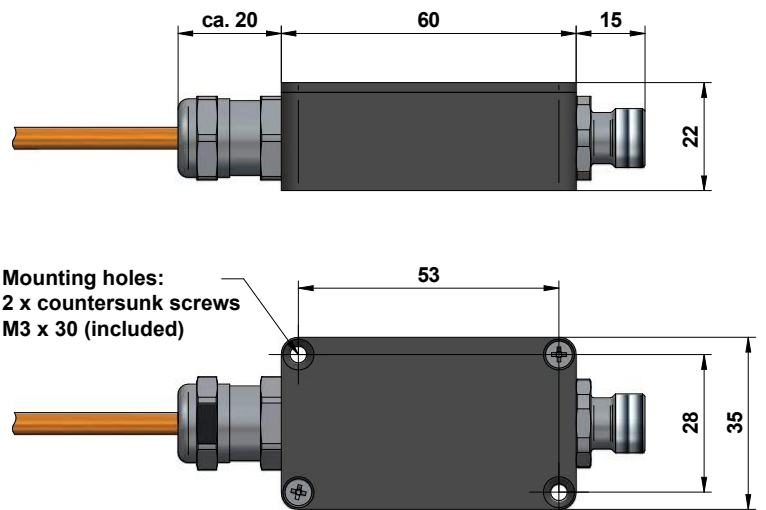
Measurement range	MB	2	5	10	25
Total length	A	166	179	193	253.5
Housing length	B	85.5	99.5	105.5	149
Rod outer position	C	38	41	45	62
Total stroke	E	5	8	12	29
Start stroke approx.	F	1.5	1.5	1	2
End stroke approx.	G	1.5	1.5	1	2

TECHNICAL DRAWING ELECTRONICS

DIN rail electronics LVA

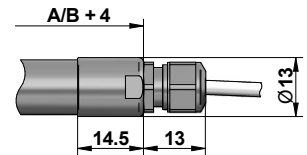
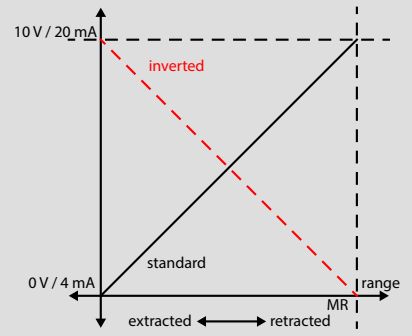


Cable electronics LVC



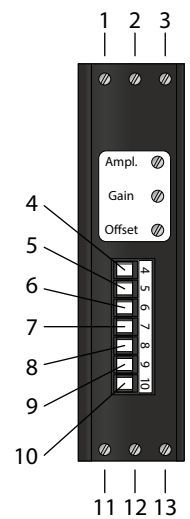
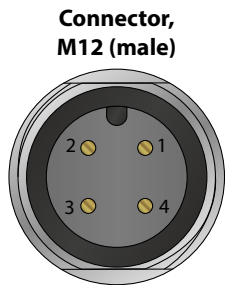
OPTIONS

Option	Order code	Description
Improved linearity	L10	The sensors linearity is improved to $\pm 0.1\%$.
Inverted output signal (Only in combination with electronics LVA or LVC)	IN	By default, the analog output signal of the electronics increases as the rod retracts. With the option IN the signal is inverted, i.e. the signal drops as the rod retracts.
Increased temperature range High (Not in combination with TF, SA, SR or 5 pole cable)	H200	With this option, the temperature range of the sensor is increased to $-40\dots+200\text{ }^{\circ}\text{C}$. (Changed cable output with PFA cable see drawing.)
TEDS connector (in combination with cable output only, not in combination with electronic LVA or LVC; more information about TEDS)	TD, TDP	TD: Assembling TDP: Assembling + programming



ELECTRICAL CONNECTION

Sensor LV for DIN rail electronics LVA				DIN rail electronics LVA	
Function	Cable output	Connector output	Connection cable K4P...	Function	Terminal
Primary 1	BN	Pin 1	BN	Shield	1
Primary 2	WH	Pin 2	WH	GND _{supply}	2
Secondary 2	BU	Pin 3	BU	+V	3
Secondary 1	BK	Pin 4	BK	n. c.	4
				Primary 2	5
				Secondary 2	6
				Shield	7
				Secondary 1	8
				Primary 1	9
				n. c.	10
				GND _{signal}	11
				Signal	12
				Shield	13

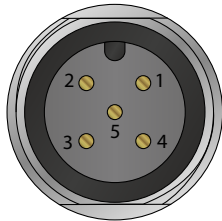


ELECTRICAL CONNECTION

Sensor LV for cable electronics LVC

Function	Connector output	Connection cable K5P...
Primary 1	Pin 1	BN
Primary 2	Pin 2	WH
Secondary 2	Pin 3	BU
Secondary 1	Pin 4	BK
Centre 1, 2	Pin 5	GY

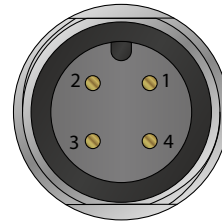
Connector,
M12 (male)



Cable electronics LVC

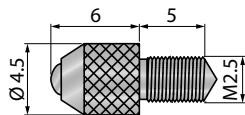
Function	Connector output	Connection cable K4P...
+V	Pin 1	BN
Signal	Pin 2	WH
GND _{supply}	Pin 3	BU
GND _{signal}	Pin 4	BK

Connector,
M12 (male)

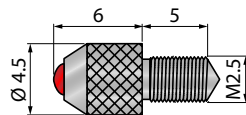


ACCESSORIES PROBE TIPS

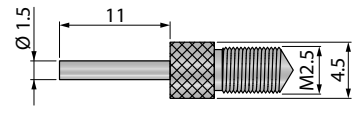
Standard: ball probe tip, steel



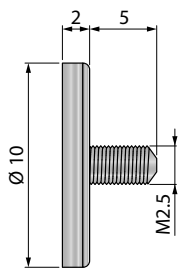
TP-K-6-R: ball probe tip, ruby



TP-S-11-S: probe pin, steel

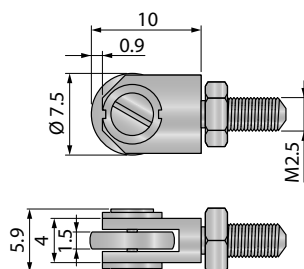


TP-T-10-S: probe plate, steel



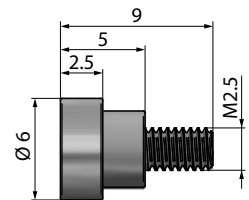
TP-R-7.5-S: probe roller, steel

Suitable for surface roughness with max. edge height (90°): 1 mm



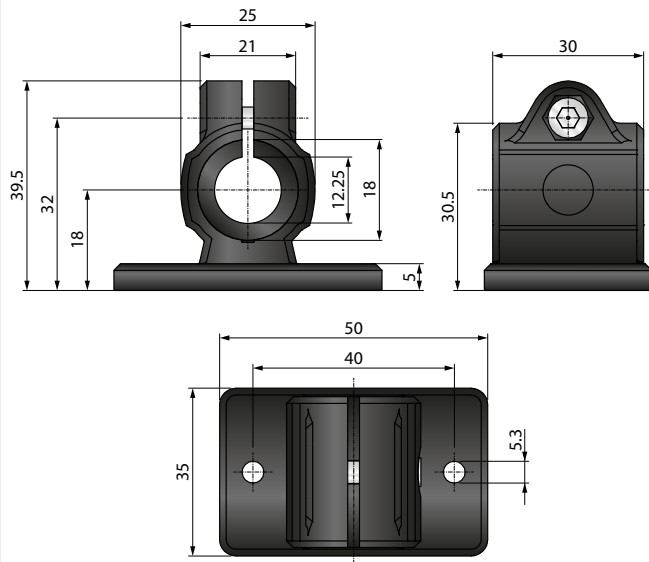
TP-T-6-M: magnetic probe tip

Magnetic holding force: approx. 560 g
Temperature range: up to 120 °C

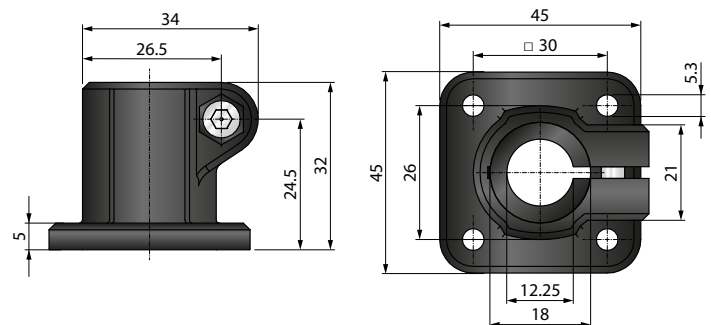


ACCESSORIES CLAMPING PIECES

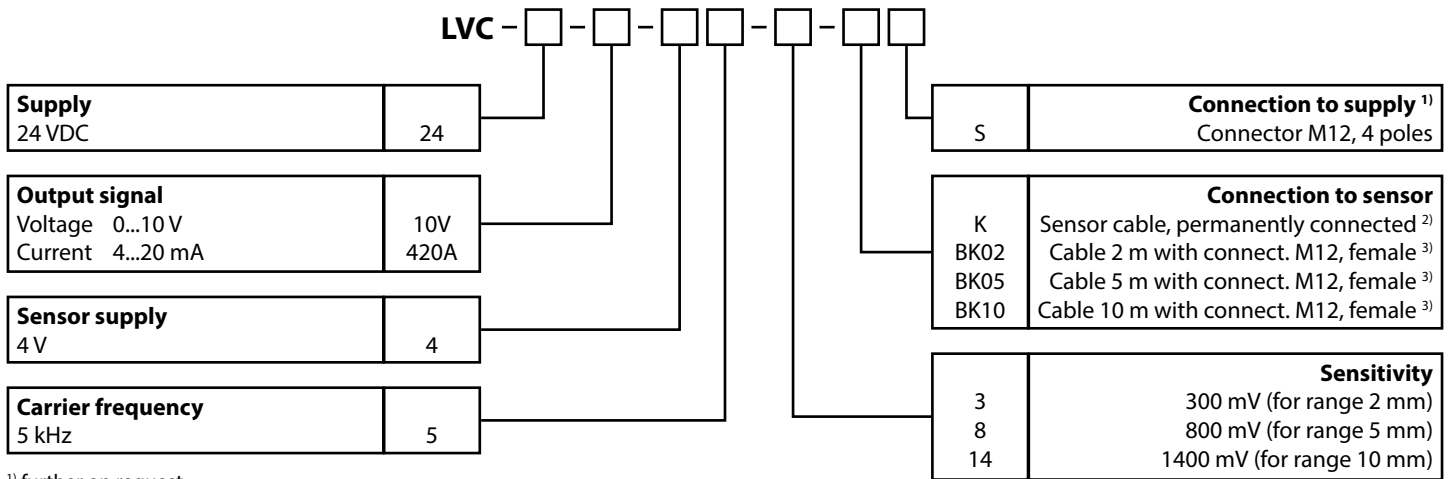
Flange clamping piece FKPA-1218, polyamide



Foot clamping piece FSKPA-1218, polyamide



ORDER CODE ELECTRONICS LVC



¹⁾ further on request.

²⁾ for sensor with cable output. Please specify the cable length in the sensor order code.

³⁾ for sensor with connector output.

Please note that the connector at the end of the cable has a temperature range of -25...+85 °C.

ACCESSORIES

Probe tips

TP-K-6-R	Ball probe tip, ruby
TP-T-10-S	Probe plate, steel
TP-S-11-S	Probe pin, steel
TP-R-7.5-S	Probe roller, steel
TP-T-6-M	Magnetic probe tip

Mounting accessories

FKPA-1218	Flange clamping piece, polyamide
FSKPA-1218	Foot clamping piece, polyamide

Cable with connector (female) M12, 4 poles, shielded

K4P2M-S-M12	2 m, straight connector
K4P5M-S-M12	5 m, straight connector
K4P10M-S-M12	10 m, straight connector
K4P2M-SW-M12	2 m, angular connector
K4P5M-SW-M12	5 m, angular connector
K4P10M-SW-M12	10 m, angular connector

Cable with connector (female) M12, 5 poles, shielded

K5P2M-S-M12	2 m, straight connector
K5P5M-S-M12	5 m, straight connector
K5P10M-S-M12	10 m, straight connector
K5P2M-SW-M12	2 m, angular connector
K5P5M-SW-M12	5 m, angular connector
K5P10M-SW-M12	10 m, angular connector

Digital displays for sensors with analog output, 2 channel

WAY-AX-S	Touch screen, supply: 18...30 VDC
WAY-AX-AC	Touch screen, supply: 115...230 VAC

For more information and options please refer to the [WAY-AX data sheet](#).

Subject to change without prior notice.

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