

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: $-40\text{...}+120\text{ }^\circ\text{C}$, optional $-40\text{...}+200\text{ }^\circ\text{C}$
- 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. The listed values are combined with the linearity of the electronics.

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

³⁾ Version TF (spring-loaded rod with bellows) cannot be combined with measuring range 25 mm

Versions S (guided rod) and G (guided rod with ball joints) are mounted on bearings, including anti-roll protection and end stop on both sides

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

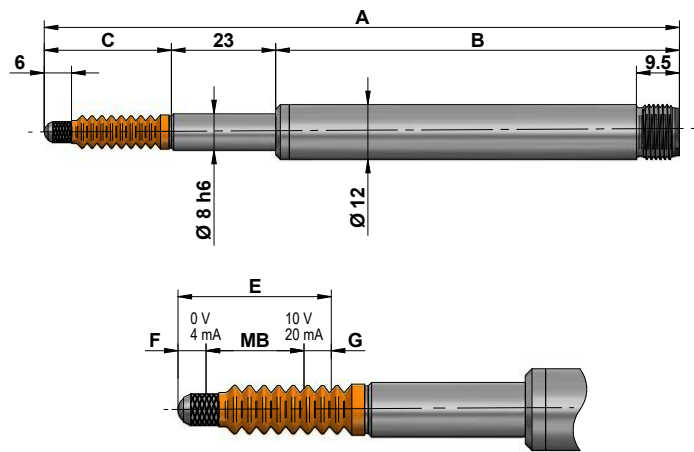
TECHNICAL DATA ELECTRONICS

		DIN rail electronics LVA	Cable electronics LVC2
Output		0...10 V / 4...20 mA	
Noise	[mV _{RMS}]	<20	<2
Supply	[VDC]	18...36	18...26
Current consumption (without load)	[mA]	<80 (at 24 V) / <100 (at 18 V)	<80 (at 24 V)
Isolation voltage	[VDC]	500	
Isolation resistance at 500 VDC	[GΩ]	1	10
Cut-off frequency		max. 10 % of excitation frequency	
Sensor supply	[V _{RMS}]	3	4
Carrier frequency	[kHz]	5	
Protection class		IP40	IP64 ¹⁾ / optional: IP67
Operating temperature	[°C]	-25...+85	
Storage temperature	[°C]	-25...+85	
Temperature coefficient sensitivity	[% F.S./K]	<±0.04	-
Temperature coefficient zero point	[% F.S./K]	<±0.015	-
Temperature coefficient	[% F.S./K]	-	<±0.015
Mounting		DIN rail	2 x mounting holes M4 or 4 x mounting feet
Housing		Polyamide PA6.6	Aluminium (powder-coated)

¹⁾ When using the mounting holes, the LVC2 housing must be properly closed again to maintain the IP64 protection class.

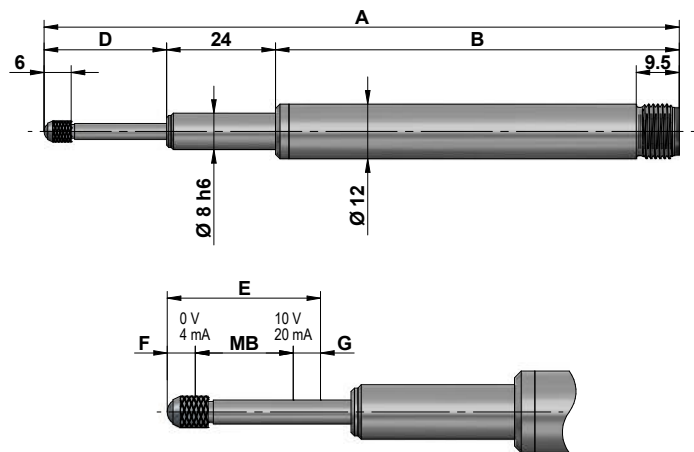
TECHNICAL DRAWING SENSOR LV

Version with bellow (TF)



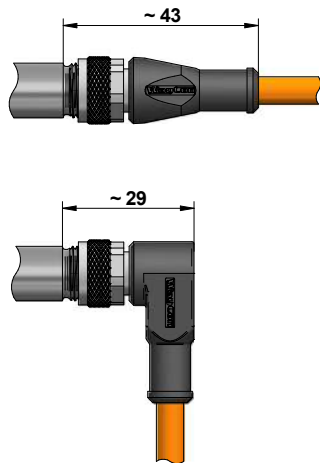
Measurement range	MB	2	5	10
Total length	A	113	126	140
Housing length	B	69	79	89
Rod outer position	C	21	24	28
Total stroke	E	5	8	12
Start stroke approx.	F	1.5	1.5	1
End stroke approx.	G	1.5	1.5	1

Version without bellow (T and S)

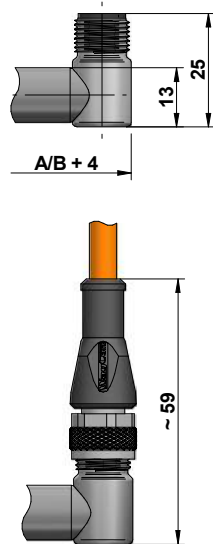


Measurement range	MB	2	5	10	25
Total length	A	113	126	140	191.5
Housing length	B	69	79	89	132.5
Rod outer position	D	20	23	27	36
Total stroke	E	5	8	12	29
Start stroke approx.	F	1.5	1.5	1	2
End stroke approx.	G	1.5	1.5	1	2

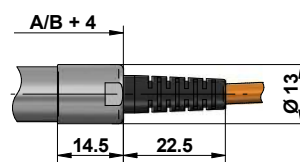
Connector output, axial



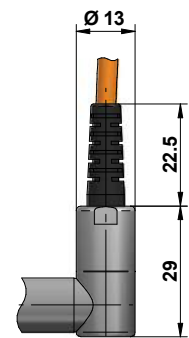
Connector output, radial



Cable output, axial

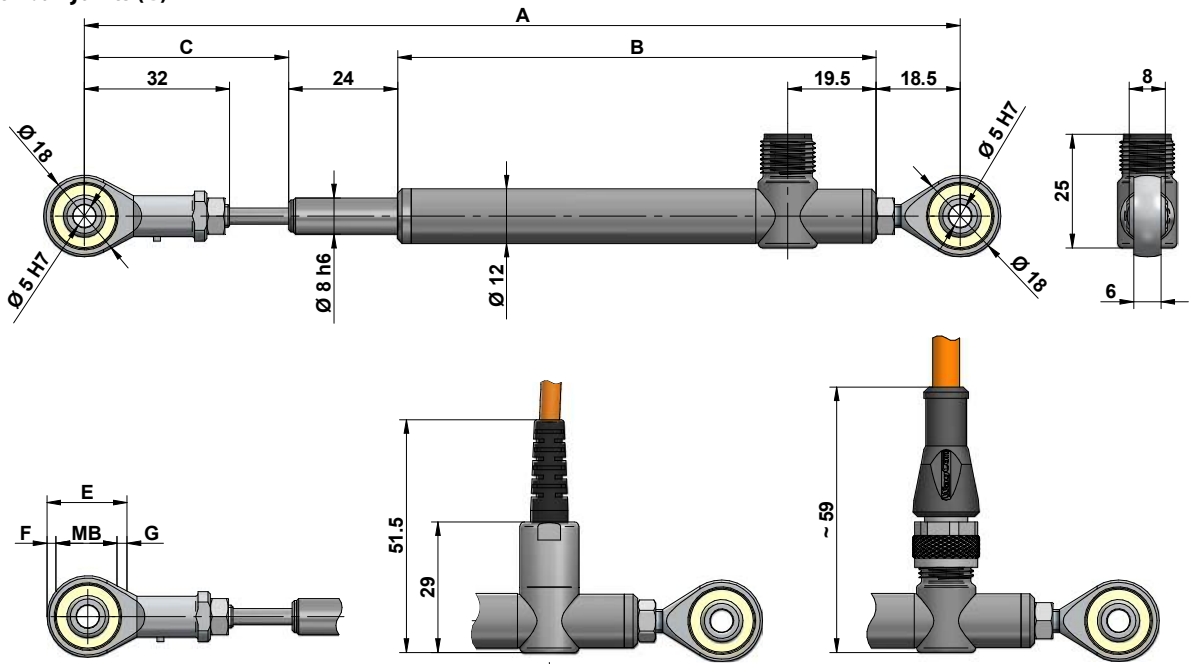


Cable output, radial



TECHNICAL DRAWING SENSOR LV

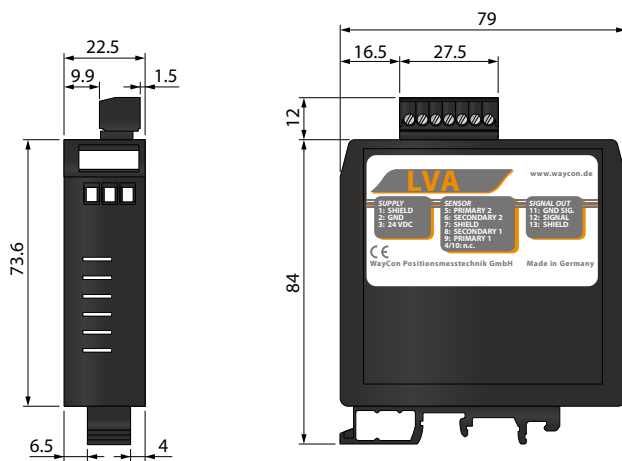
Version with ball joints (G)



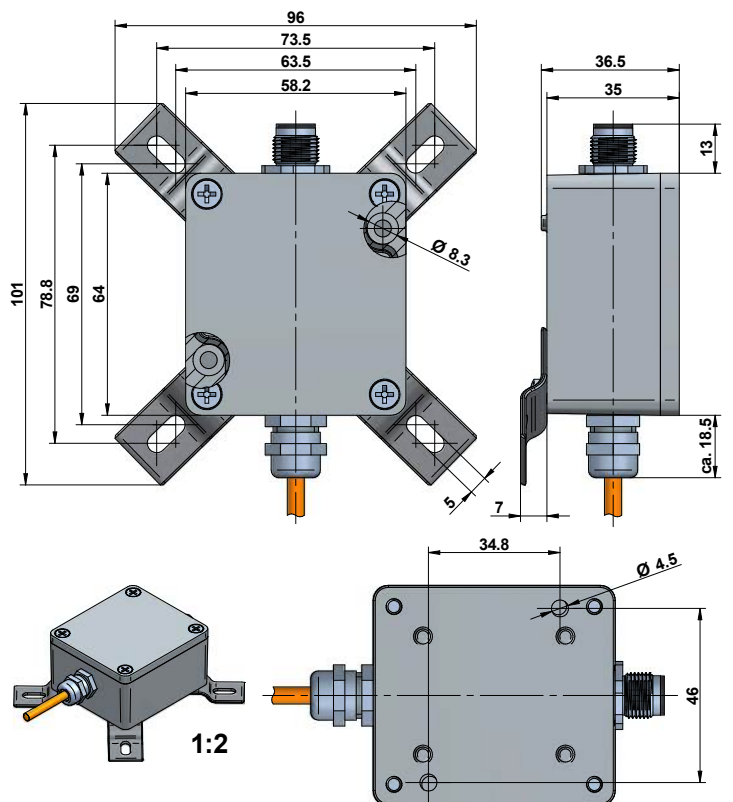
Measurement range	MB	2	5	10	25
Total length	A	166	179	193	253.5
Housing length	B	85.5	99.5	105.5	149
Rod outer position	C	38	41	45	62
Total stroke	E	5	8	12	29
Start stroke approx.	F	1.5	1.5	1	2
End stroke approx.	G	1.5	1.5	1	2

TECHNICAL DRAWING ELECTRONICS

DIN rail electronics LVA

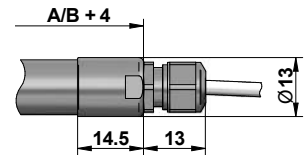
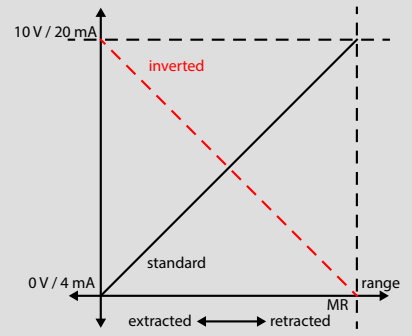


Cable electronics LVC2



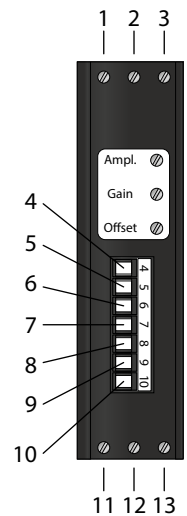
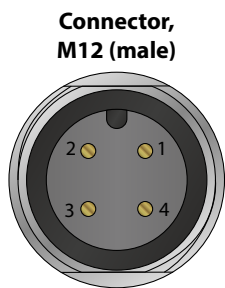
OPTIONS

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 LVC2)	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 LVC2; more information about TEDS)	TD, TDP	TD: Assembling TDP: Assembling + programming
Improved protection class IP67 for LVC2	IP67	The use of a special sealing compound protects the electronic components and thus achieves protection class IP67.



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

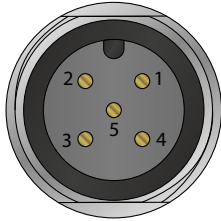


ELECTRICAL CONNECTION

Sensor LV for cable electronics LVC2

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

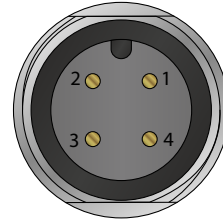
Connector,
M12 (male)



Cable electronics LVC2

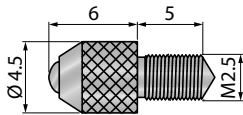
Function	Connector output	Connection cable K4P...
+V	Pin 1	BN
Signal	Pin 2	WH
GND _{supply}	Pin 3	BU
GND _{signal}	Pin 4	BK

Connector,
M12 (male)

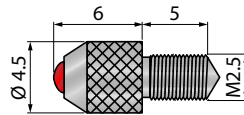


ACCESSORIES PROBE TIPS

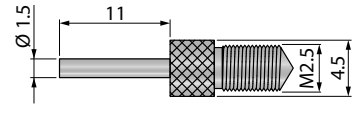
Standard: ball probe tip, steel



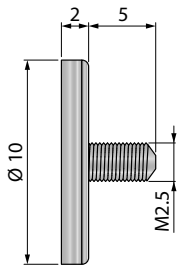
TP-K-6-R: ball probe tip, ruby



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

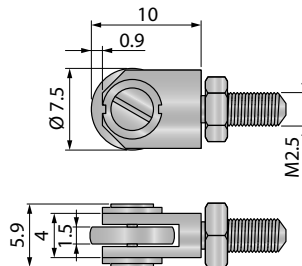


TP-T-10-S: probe plate, steel



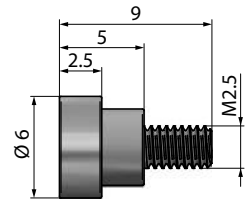
TP-R-7.5-S: probe roller, steel

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

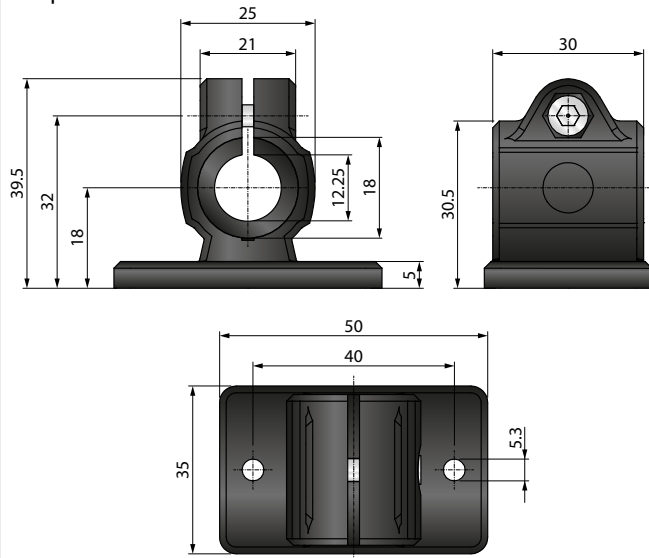


ACCESSORIES CLAMPING PIECES

Flange clamping piece FKPA-1218

Material: PA6-GB30

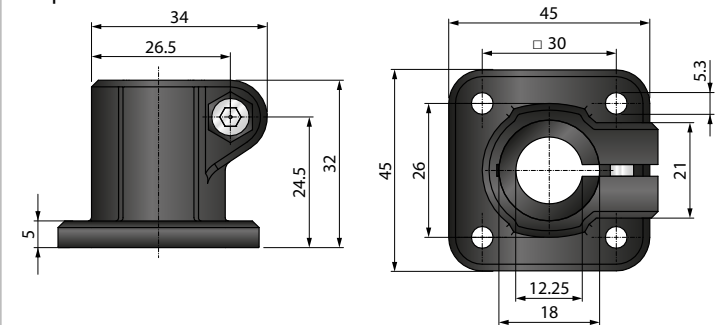
Temperature: 0...80 °C



Foot clamping piece FSKPA-1218

Material: PA6-GB30

Temperature: 0...80 °C



ORDER CODE SENSOR LV

LV - [] - [] - [] - [] - []

Version Spring loaded with bellow, IP67 ¹⁾ Spring loaded without bellow, IP65 Guided rod without bellow, IP65 Guided rod with ball joints, IP65 ²⁾	TF T S G
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Measurement range MR [mm] 2 / 5 / 10 / 25	e. g. 5
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Electronics code number Sensor without external electronics For LVA with output 4...20 mA For LVA with output 0...10 V For LVC2 with output 4...20 mA For LVC2 with output 0...10 V	000 300 310 100 110
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Connection for electronics LVA Connector output M12, axial, 4 poles Connector output M12, radial, 4 poles Cable output 2 m, axial, 4 poles Cable output 5 m, axial, 4 poles Cable output 10 m, axial, 4 poles Cable output 2 m, radial, 4 poles Cable output 5 m, radial, 4 poles Cable output 10 m, radial, 4 poles	SA12 SR12 KA02 KA05 KA10 KR02 KR05 KR10
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Connection for electronics LVC2 Connector output M12, axial, 5 pol. ³⁾ Connector output M12, radial, 5 pol. ³⁾ Cable output 2 m, axial, 5 poles Cable output 5 m, axial, 5 poles Cable output 10 m, axial, 5 poles Cable output 2 m, radial, 5 poles Cable output 5 m, radial, 5 poles Cable output 10 m, radial, 5 poles	SA512 SR512 KA502 KA505 KA510 KR502 KR505 KR510
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- 0	Version Standard Sensor with options
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Option L10 IN H200 TD TDP	Description Improved linearity ±0,1 % Inverted output signal ⁴⁾ Temperature range -40...+200 °C TEDS: assembling + programming ⁵⁾ TEDS: assembling + programming + 35 measurement points ⁵⁾
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Option H200 TD TDP	Description TF, SA, SR, KA5XX, KR5XX, LVC2 SA, SR, electronics LVA, LVC2 SA, SR, electronics LVA, LVC2
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¹⁾ bellow not combinable with measurement range 25 mm
²⁾ ball joints not combinable with axial cable or connector output
³⁾ versions with 5 pole connector output: temperature range -40...+85 °C
⁴⁾ only if used with electronics LVA or LVC2
⁵⁾ for more information about TEDS connectors see [here](#)

ORDER CODE ELECTRONICS LVA

LVA - [] - [] - [] - [] - []

Supply 24 VDC	24
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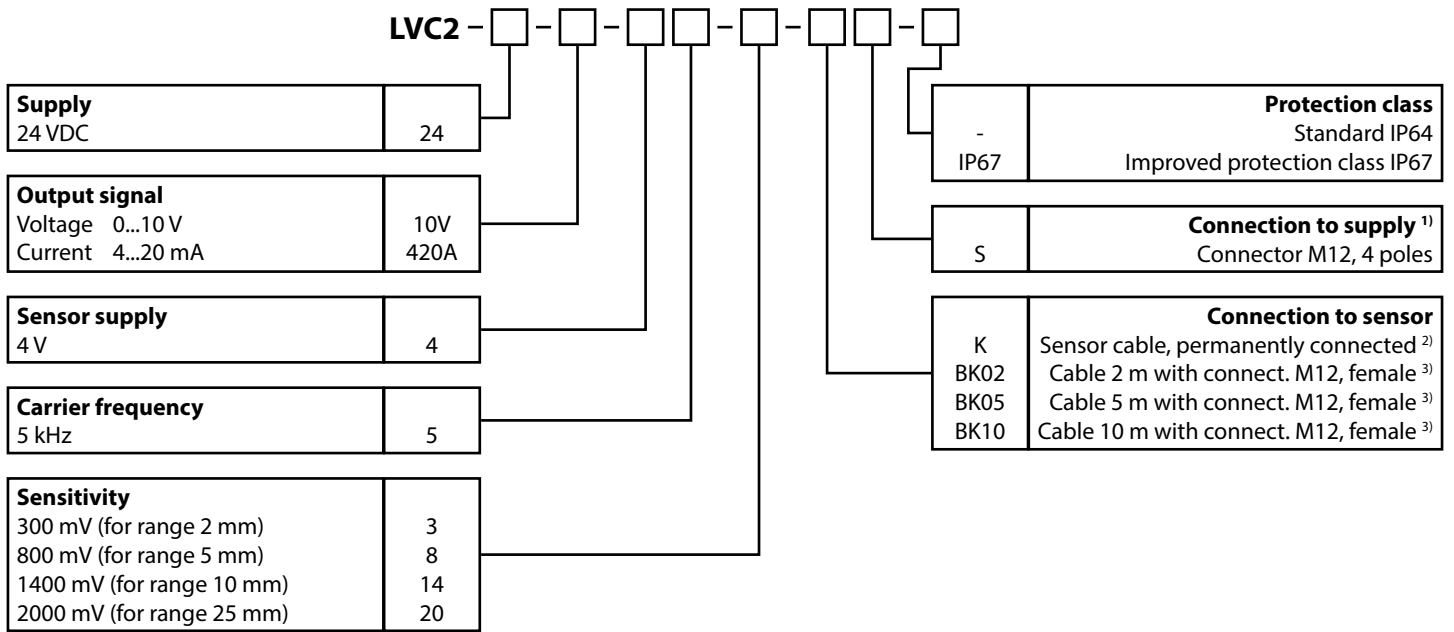
Output signal Voltage 0...10 V Current 4...20 mA	10V 420A
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Sensor supply 3 V	3
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2 5 10 15	Sensitivity 200 mV (for range 2 mm) 500 mV (for range 5 mm) 1000 mV (for range 10 mm) 1500 mV (for range 25 mm)
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5	Carrier frequency 5 kHz
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ORDER CODE ELECTRONICS LVC2



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

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

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](#).

Mounting accessories

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

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

Subject to change without prior notice.

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