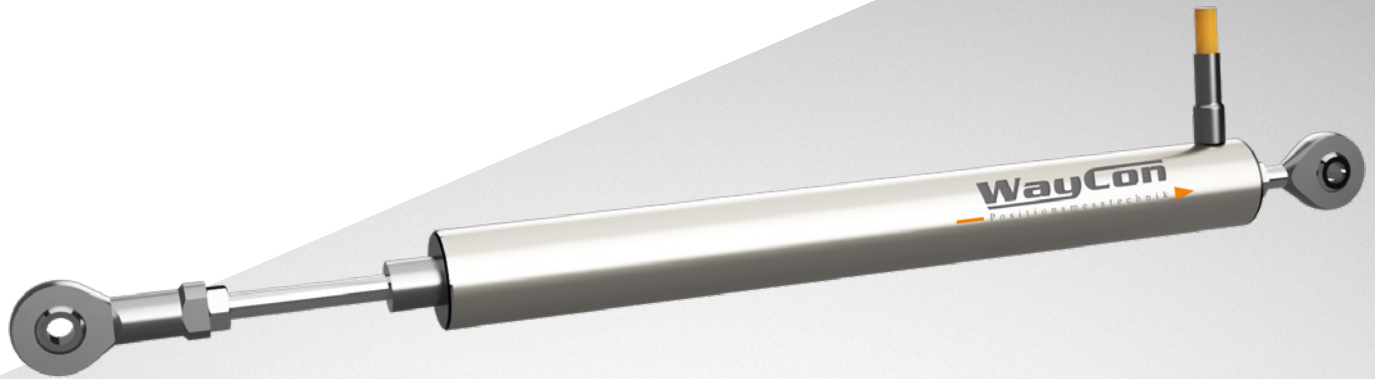


# INDUCTIVE SENSOR LVDT

Links to further documents for this series:

[Installation guide](#)

[Calibration Instructions LVA](#)



## LVIG SERIES

### Key-Features:

- Sensor with integrated or external electronics
- Rod with ball joint eyes
- Measurement ranges from 2 mm to 200 mm
- Linearity up to  $\pm 0.35\%$
- Analog output: 0...10 V or 4...20 mA
- Protection class up to IP67
- Temperature range up to  $-35...+120\text{ }^{\circ}\text{C}$

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## TECHNICAL DATA - SENSOR WITH INTEGRATED ELECTRONICS

| Measurement range             | [mm]                 | 2  | 5   | 10  | 20  | 50  | 100 <sup>1)</sup> | 200 <sup>1)</sup> |  |
|-------------------------------|----------------------|--|-----|-----|-----|-----|-------------------|-------------------|--|
| Linearity                     | [% F.S.]             | <±0.5 / optional: <±0.35                   |     |     |     |     |                   | <±1               |  |
| Output                        |                      | 0...10 V / 4...20 mA                       |     |     |     |     |                   |                   |  |
| Supply                        | [VDC]                | 24 ±20 %                                   |     |     |     |     |                   |                   |  |
| Current consumption (no load) | [mA]                 | Voltage output: <20 / Current output: <40  |     |     |     |     |                   |                   |  |
| Load resistance               | [kΩ]                 | Voltage output: >10 / Current output: <0.5 |     |     |     |     |                   |                   |  |
| Noise                         | [mV <sub>RMS</sub> ] | <10  |     |     |     |     |                   |                   |  |
| Cut-off frequency (-3 dB)     | [Hz]                 | 100  |     |     |     |     |                   |                   |  |
| Connection                    |                      | Cable output, radial, 5 poles              |     |     |     |     |                   |                   |  |
| Protection class              |                      | IP65                                       |     |     |     |     |                   |                   |  |
| Operating temperature         | [°C]                 | 0...+70 (at low humidity, not freezing)    |     |     |     |     |                   |                   |  |
| Storage temperature           | [°C]                 | -30...+80                                  |     |     |     |     |                   |                   |  |
| Temperature coefficient       | [% F.S./K]           | ±0.04                                      |     |     |     |     |                   |                   |  |
| Shock resistance              |                      | 100 g, 2 ms (DIN IEC68T2-27)               |     |     |     |     |                   |                   |  |
| Vibration resistance          |                      | 10 g, 2...2000 Hz (DIN IEC68T2-6)          |     |     |     |     |                   |                   |  |
| Housing                       |                      | Nickel plated steel                        |     |     |     |     |                   |                   |  |
| Core                          |                      | Nickel iron alloy                          |     |     |     |     |                   |                   |  |
| Weight approx.                | [g]                  | 155  | 180 | 195 | 245 | 305 | 510               | 860               |  |

<sup>1)</sup> For a horizontal installation, the sensor housing must be stabilized additionally. An axial alignment must be ensured. Otherwise the sensor could bend due to its own weight! We recommend to use 3 mounting blocks.

## TECHNICAL DATA - SENSOR FOR EXTERNAL ELECTRONICS

| Measurement range       | [mm]                | 2  | 5   | 10  | 20  | 50  | 100 <sup>1)</sup> | 200 <sup>1)</sup> |  |
|-------------------------|---------------------|--|-----|-----|-----|-----|-------------------|-------------------|--|
| Linearity               | [% F.S.]            | <±0.5 / optional: <±0.35                   |     |     |     |     |                   | <±1               |  |
| Sensitivity             | [mV/V/mm]           | 76   | 82  | 43  | 34  | 27  | 12,2              | 7                 |  |
| Calibrated at           |                     | 5 V <sub>RMS</sub> / 2.5 kHz / RL = 1 MΩ   |     |     |     |     |                   |                   |  |
| Excitation voltage      | [V <sub>RMS</sub> ] | 1...10                                     |     |     |     |     |                   |                   |  |
| Excitation frequency    | [kHz]               | 0.5...5                                    |     |     |     |     |                   |                   |  |
| Input resistance typ.   | [Ω]                 | 332  | 69  | 97  | 175 | 221 | 460               | 820               |  |
| Input impedance typ.    | [Ω]                 | 790  | 134 | 188 | 345 | 369 | 2240              | 5770              |  |
| Output impedance typ.   | [Ω]                 | 900  | 170 | 118 | 360 | 525 | 2140              | 5060              |  |
| Connection              |                     | Cable output, radial, 5 poles              |     |     |     |     |                   |                   |  |
| Protection class        |                     | IP65 / optional: IP67                      |     |     |     |     |                   |                   |  |
| Operating temperature   | [°C]                | -35...+120 (at low humidity, not freezing) |     |     |     |     |                   |                   |  |
| Storage temperature     | [°C]                | -55...+120                                 |     |     |     |     |                   |                   |  |
| Temperature coefficient | [% F.S./K]          | ±0,02                                      |     |     |     |     |                   |                   |  |
| Shock resistance        |                     | 200 g, 2 ms (DIN IEC68T2-27)               |     |     |     |     |                   |                   |  |
| Vibration resistance    |                     | 10 g, 2...2000 Hz (DIN IEC68T2-6)          |     |     |     |     |                   |                   |  |
| Housing                 |                     | Nickel plated steel                        |     |     |     |     |                   |                   |  |
| Core                    |                     | Nickel iron alloy                          |     |     |     |     |                   |                   |  |
| Weight approx.          | [g]                 | 140  |     |     | 165 | 180 | 230               | 290               |  |

<sup>1)</sup> For a horizontal installation, the sensor housing must be stabilized additionally. An axial alignment must be ensured. Otherwise the sensor could bend due to its own weight! We recommend to use 3 mounting blocks.

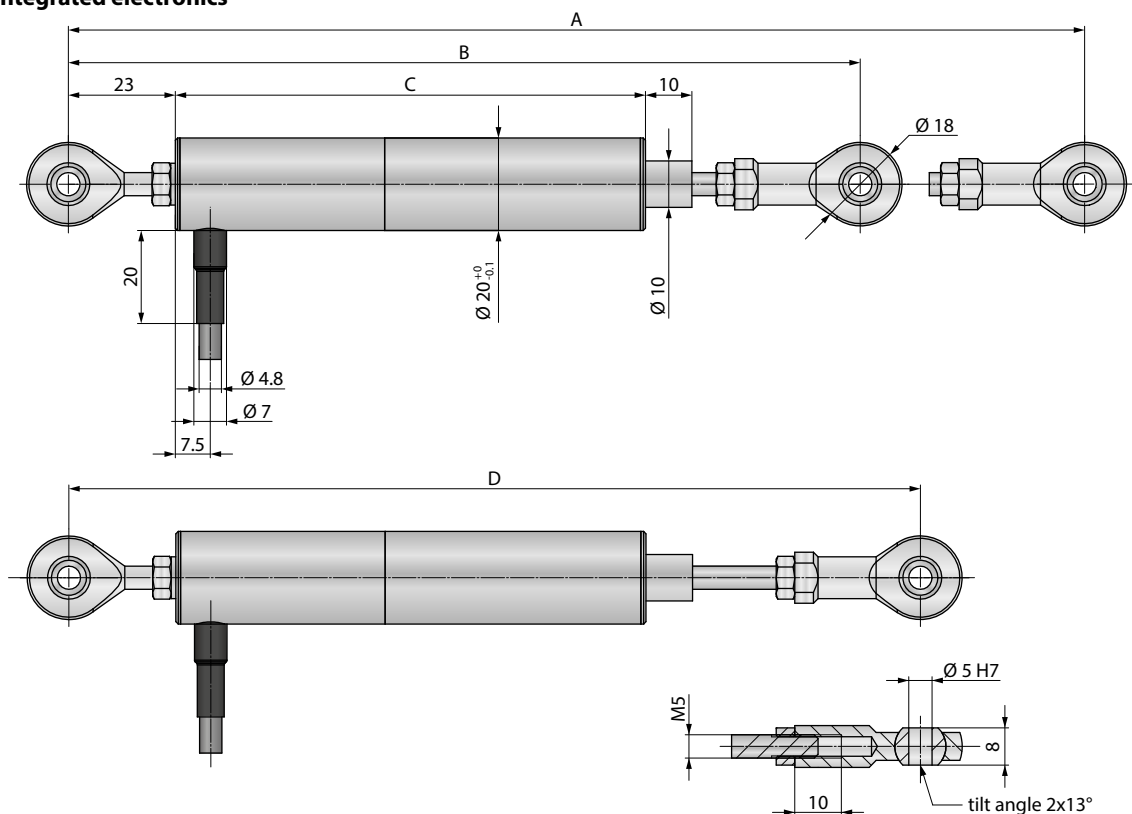
## TECHNICAL DATA - EXTERNAL ELECTRONICS

|                                     |                      |                                   |
|-------------------------------------|----------------------|-----------------------------------|
| Output                              |                      | 0...10 V / 4...20 mA              |
| Linearity <sup>1)</sup>             | [% F.S.]             | <±0.01                            |
| Noise                               | [mV <sub>RMS</sub> ] | <20                               |
| Supply                              | [VDC]                | 18...36                           |
| Current consumption (without load)  | [mA]                 | <80 (at 24 V) / <100 (at 18 V)    |
| Isolation voltage                   | [VDC]                | 500                               |
| Isolation resistance                |                      | 1 GΩ at 500 VDC                   |
| Cut-off frequency                   |                      | max. 10 % of excitation frequency |
| Sensor supply                       | [V <sub>RMS</sub> ]  | 3                                 |
| Carrier frequency                   | [kHz]                | 2.5 (MR≥50 mm) / 5 (MR≤20 mm)     |
| Protection class                    |                      | IP40                              |
| 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                           |
| Mounting                            |                      | DIN rail                          |
| Housing                             |                      | Polyamid PA6.6                    |

<sup>1)</sup> To achieve optimum measurement results, it is recommended to power up the electronics for 10 min before measurement.

## TECHNICAL DRAWING - SENSOR

### Sensor with integrated electronics



| Measurement range          |          | 2   | 5   | 10  | 20  | 50  | 100 | 200 |
|----------------------------|----------|-----|-----|-----|-----|-----|-----|-----|
| <b>Rod outer position</b>  | <b>A</b> | 182 | 196 | 235 | 310 | 515 | 785 |     |
| <b>Rod inner position</b>  | <b>B</b> | 163 | 170 | 204 | 250 | 384 | 570 |     |
| <b>Housing length</b>      | <b>C</b> | 87  | 101 | 140 | 185 | 320 | 490 |     |
| <b>Middle of stroke ±1</b> | <b>D</b> | 173 | 183 | 219 | 280 | 443 | 678 |     |

## TECHNICAL DRAWING - SENSOR

**Sensor for external electronics**

Dimensions and features shown in the drawing:

- Overall length: A
- Distance from left eyelet to start of main body: 23
- Main body length: B
- Distance from end of main body to right eyelet: 10
- Distance from left eyelet to end of main body: C
- Eyelet diameter:  $\varnothing 18$
- Main body diameter:  $\varnothing 20_{+0, -0,1}$
- End section diameter:  $\varnothing 10$
- Mounting hole diameter:  $\varnothing 3$
- Mounting hole offset: 7.5
- Mounting hole depth: 15
- Detail view shows: M5 thread, 10mm length,  $\varnothing 5\ H7$  hole, and tilt angle  $2 \times 13^\circ$ .

| Measurement range                          |          | 2   | 5   | 10  | 20  | 50  | 100 | 200 |
|--|----------|-----|-----|-----|-----|-----|-----|-----|
| <b>Rod outer position</b>                  | <b>A</b> | 157 | 171 | 210 | 285 | 490 | 760 |     |
| <b>Rod inner position</b>                  | <b>B</b> | 138 | 145 | 179 | 225 | 359 | 545 |     |
| <b>Housing length</b>                      | <b>C</b> | 62  | 76  | 115 | 160 | 295 | 465 |     |
| <b>Middle of stroke <math>\pm 1</math></b> | <b>D</b> | 148 | 158 | 194 | 255 | 418 | 653 |     |

## TECHNICAL DRAWING - EXTERNAL ELECTRONICS

Dimensions and features shown in the drawing:

- Front view dimensions: 73.6 (height), 22.5 (width), 9.9 (offset), 1.5 (width), 6.5 (width), 4 (width).
- Side view dimensions: 84 (height), 12 (height), 16.5 (width), 27.5 (width), 79 (width).
- Terminal block labels: SUPPLY (1: SHIELD, 2: GND, 3: 24 VDC), SENSOR (1: PRIMARY 2, 2: SECONDARY 2, 3: SECONDARY 1, 4: 10k $\Omega$ ), SIGNAL OUT (1: GND, 2: SIGNAL, 3: SHIELD).
- Manufacturer: WayCon Positionsmesstechnik GmbH, Made in Germany.

## ELECTRICAL CONNECTION - SENSOR

| Sensor with integrated electronics |              | Sensor for external electronics |              |
|------------------------------------|--------------|---------------------------------|--------------|
| Function                           | Cable colour | Function                        | Cable colour |
| +V                                 | BN           | Primary 1                       | RD           |
| GND <sub>Supply</sub>              | GY           | Primary 2                       | BK           |
| Signal                             | GN           | Secondary 1                     | OG           |
| GND <sub>Signal</sub>              | WH           | Secondary 2                     | YE           |
| n. c.                              | YE           | Secondary 1, 2 centre           | WH           |
|                                    |              | Shield                          | Housing      |

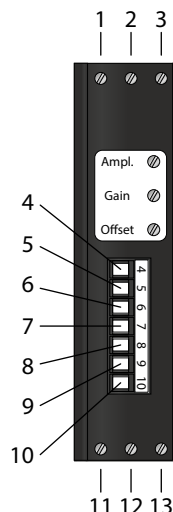
Schematic diagram labels:

- secondary 1
- secondary 2
- secondary 1, 2 centre
- core
- primary 1
- primary 2

## ELECTRICAL CONNECTION - EXTERNAL ELECTRONICS

### DIN-rail electronics LVA

| Function              | Terminal |
|-----------------------|----------|
| Shield                | 1        |
| GND <sub>Supply</sub> | 2        |
| +V                    | 3        |
| n. c.                 | 4        |
| Primary 2             | 5        |
| Secondary 2           | 6        |
| Shield                | 7        |
| Secondary 1           | 8        |
| Primary 1             | 9        |
| n. c.                 | 10       |
| GND <sub>Signal</sub> | 11       |
| Signal                | 12       |
| Shield                | 13       |



## ORDER CODE - SENSOR

LVIG - [ ] - [ ] - [ ] - [ ]

|   |         |
|---|---------|
| <b>Measurement range [mm]</b><br>2 / 5 / 10 / 20 / 50 / 100 <sup>1)</sup> / 200 <sup>1)</sup> | e. g. 5 |
|---|---------|

|  |             |
|--|-------------|
| <b>Output</b><br><b>Integrated electronics</b><br>Voltage 0...10V<br>Current 4...20 mA       | 10V<br>420A |
| <b>External electronics</b><br>For LVA with output 4...20 mA<br>For LVA with output 0...10 V | 300<br>310  |
| <b>Sensor without electronics</b>  | 000         |

|   |      |
|---|------|
| <b>Connection</b><br>Cable output, radial <sup>2)</sup> | KR__ |
|---|------|

|             |  |
|-------------|--|
| -           | <b>Version</b><br>Standard without options<br>Improved linearity ±0.35 %<br>Improved protection class IP67 |
| L35<br>IP67 |  |

|                              |  |
|------------------------------|--|
| <b>Option</b><br>L35<br>IP67 | <b>Not combinable with</b><br>Ranges 100 / 200<br>Sensor with integrated electronics |
|------------------------------|--|

<sup>1)</sup> For a horizontal installation, the sensor housing must be stabilized additionally. An axial alignment must be ensured. Otherwise the sensor could bend due to its own weight! We recommend to use 3 mounting blocks.

<sup>2)</sup> Length in m (min. 1 m). Example: KR01 = 1 m (standard), KR02 = 2 m

## ORDER CODE - EXTERNAL ELECTRONICS

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

|                         |    |
|-------------------------|----|
| <b>Supply</b><br>24 VDC | 24 |
|-------------------------|----|

|  |             |
|--|-------------|
| <b>Output signal</b><br>Voltage 0...10V<br>Current 4...20 mA | 10V<br>420A |
|--|-------------|

|                             |   |
|-----------------------------|---|
| <b>Sensor supply</b><br>3 V | 3 |
|-----------------------------|---|

|                    |  |
|--------------------|--|
| 2<br>5<br>10<br>19 | <b>Sensitivity</b><br>200 mV (for range 2 mm)<br>500 mV (for ranges 5 and 10 mm)<br>1000 mV (for range 20 mm)<br>1900 mV (for ranges ≥50 mm) |
|--------------------|--|

|          |  |
|----------|--|
| 2.5<br>5 | <b>Carrier frequency</b><br>2.5 kHz (ranges ≥50 mm)<br>5 kHz (ranges ≤20 mm) |
|----------|--|

Subject to change without prior notice.

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