

# CALIBRATION INSTRUCTIONS

## Interfacemodul LVA for inductive sensors

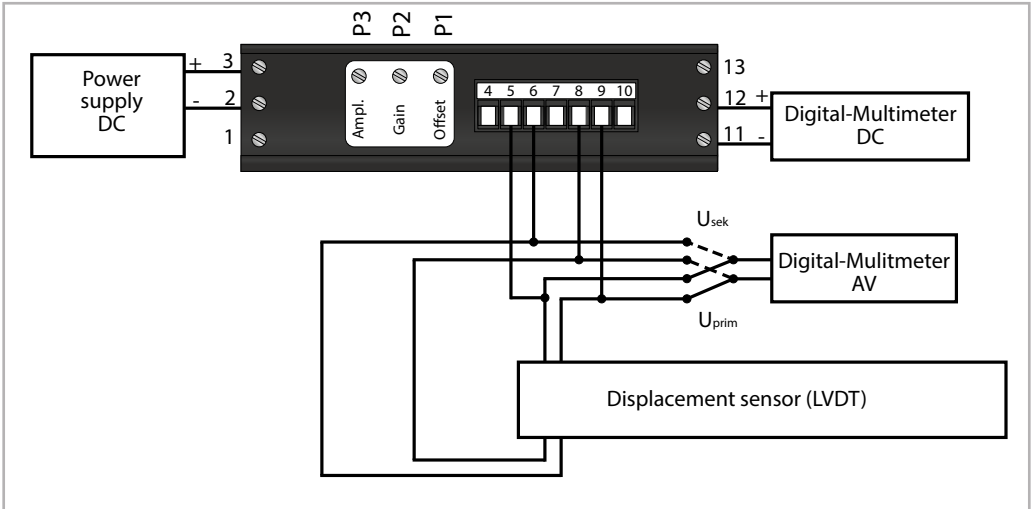
For further information please see the data sheet at  
<https://www.waycon.biz/products/inductive-sensors-lvdt/>

### MEASUREMENT EQUIPEMENT UND RESOURCES REQUIRED

Für die Bedienung des Interfacemodul LVA benötigen sie folgende Mess- und Hilfsmittel:

- ▶ LVA-LVDT to be calibrated with enclosed 7-pin plug for connection of the LVDT displacement sensor (Pin 5 to Pin 9)
- ▶ LVDT displacement sensor to be calibrated with LVA-LVDT. Sensitivity in mV/V/mm must be known
- ▶ Mounting unit with the possibility to choose exact positions of the plunger
- ▶ Power supply 24 VDC / 600mA stabilized (or 12V DC/1A for the LVA-LVDT version with 12V supply)
- ▶ DC voltage multimeter (range  $\pm 20$  V) or DC current multimeter range (0 .. 50 mA) depending on output of LVA LVDT
- ▶ AC-multimeter (true RMS) for  $0.05 V_{RMS} \dots 5 V_{RMS}$

### TEST SETUP



# STEPS TO CALIBRATE THE LVA-LVDT

1.

Build an assembly as shown in Figure.

Connect the LVDT sensor to the enclosed 7-pin connector (primary coil to Pin 5 and Pin 9, secondary coil to Pin 6 and Pin 8). Switch on supply voltage of the LVA LVDT.

2.

Measure the primary AC-voltage (Pin 5 and Pin 9) with the AC voltmeter and adjust the amplitude using potentiometer P3 (Amplitude) on the LVA-LVDT to the recommended value according to the LVA-LVDT product description. In case the LVDT sensor used is not from inelta, calculate the recommended primary voltage as follows:  $U_{\text{prim}} = U_{\text{sek}} / (E \cdot S)$

E: Sensitivity of the LVDT sensor given in mV/V/mm

S: Half measurement range of the LVDT sensor in  $\pm$ mm

$U_{\text{sek}}$ : Is given as follows:

**Sensitivity for sensor supply**

**$U_{\text{sek}}$**

(see LVA-label)

A

2,5 kHz, 3  $V_{\text{eff}}$ , 500 mV

B

2,5 kHz, 3  $V_{\text{eff}}$ , 1000 mV

C

2,5 kHz, 3  $V_{\text{eff}}$ , 1900 mV

The value for  $V_{\text{prim}}$  must not be greater than  $3.0 V_{\text{eff}}$ . If the calculation of  $V_{\text{prim}}$  gives a higher value,  $3.0 V_{\text{eff}}$  must be used.

### 3. Checking the polarity of the secondary coil

Change the position of the plunger and observe the output signal generated by the LVA-LVDT using the DC voltmeter (between Pin 12 (+signal) and Pin 11 (GND)). Check that the output signal associated with this change moves in the expected direction. If this is not the case, the connections to the secondary coil (Pin 6 and Pin 8) must be swapped.

Standard: Sensor extended: 0 V, sensor retracted: F.S.

### 4. Determining the physical origin of the distance sensor

Measure the secondary voltage (Pin 6 and Pin 8) using the AC voltmeter and change the position of the plunger until the secondary voltage takes the lowest value possible. Mark this position or fix it mechanically. This is the origin of the LVDT sensor. The end positions of the plunger are located  $\pm$  the half measurement range from the origin of the sensor, even if the plunger can be mechanically moved further than this. The sensor will not work properly beyond these end positions.

### 5. Phase calibration

Not applicable.

# STEPS TO CALIBRATE THE LVA-LVDT

## 6. Calibration of the offset

Move the plunger to the position listed in the table below, according to the type of output signal of the LVA LVDT shown on the label. Observe the output signal using the DC multimeter (between Pin 12 and Pin 11). Use potentiometer P1 (Offset) to adjust the output signal to 0 V (or 0 mA resp. 4 mA).

### LVA-LVDT output range

0...5 V  
0...10 V  
0...20 mA  
4...20 mA  
±5 V  
±10 V

### Position of plunger for LVA-LVDT calibration offset

Lower (minimum) end position  
Lower (minimum) end position  
Lower (minimum) end position  
Lower (minimum) end position  
Physical zero point  
Physical zero point

## 7. Calibration of the gain

Move the plunger to the upper (maximum) end position. Observe the output signal using the DC multimeter (between Pin 12 and Pin 11). Use potentiometer P2 (Gain) to set the output signal to the value listed in the table below according to the type of output signal shown on the label of the LVA-LVDT.

### LVA-LVDT

0...5 V  
0...10 V  
0...20 mA  
4...20 mA  
±5 V  
±10 V

### Output voltage

5 V  
10 V  
20 mA  
16 mA  
+5 V  
+10 V

## 8. Only for the Version 4 ... 20 mA of LVA-LVDT: Calibrate offset to 4 mA:

Move the plunger to the lower (minimum) end position. Observe the output signal using the DC multimeter (between Pin 12 and Pin 11). Use potentiometer P1 (offset) to adjust the output signal to 4 mA.



## DECLARATION OF EC-CONFORMITY

WayCon Positionsmesstechnik GmbH  
Mehlbeerenstrasse  
482024 Taufkirchen / Deutschland

This is to certify that the products

Classification      Measuring amplifier  
Product series      LVA

Fulfill the current request of the following EC-directives:  
Directive 2011/65/EU  
Directive 2014/30/EU

The declaration of conformity loses its validity if the product is misused or modified without proper authorisation.

Taufkirchen, 19.04.2021

A handwritten signature in blue ink, appearing to be 'A. Träger', written over a faint blue grid.

Andreas Träger  
CEO