



### Assembly Instructions induSENSOR, LVP series

#### Warnings

The power supply may not exceed the specified limits.

> Danger of injury

> Damage to or destruction of the sensor

Power supply must be connected in accordance with the safety regulations for electrical equipment.

> Danger of injury

> Damage to or destruction of the sensor

Avoid shocking and knocking the sensor.

> Damage to or destruction of the sensor

Avoid bending the coil rod or the measuring tube.

> Damage to or destruction of the sensor

Do not move the plunger to the back-stop of the sensor rod.

> Damage to or destruction of the sensor



#### Notes on CE Identification

The following applies for the induSENSOR, LVP series:

EU directive 2004/108/EC

EU directive 2011/65/EG, "RoHS" category 9

The induSENSOR, LVP series, satisfies the requirements of the standards

- EN 61326-1: 2006-10

- DIN 61326-2-3: 2007-05

#### Proper Environment

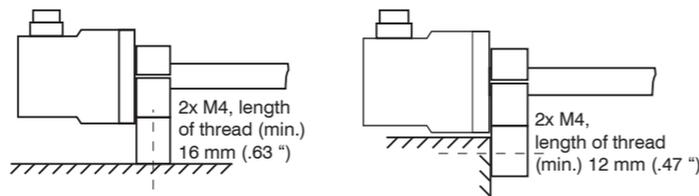
- Protection class for sensor: IP 67
- Operating temperature: -40 to +85 °C (-40 to +185 °F)  
 $R_L \leq 500 \text{ Ohm}$
- Storage temperature: -40 to +100 °C (-40 to +212 °F)
- Humidity: 5 - 95 % (non condensing)
- Ambient pressure: Atmospheric pressure
- EMC acc. to: EN 61326-1: 2006-10 and  
DIN 61326-2-3: 2007-05

#### Installation and Mounting

##### Centering and Mounting the Plunger

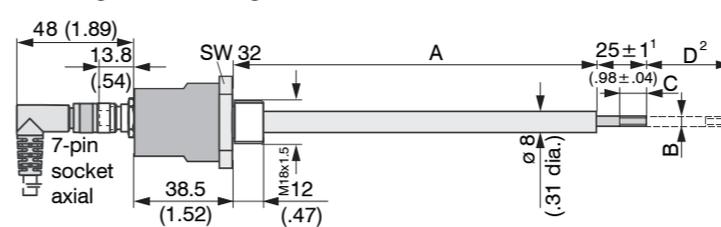
Screw the plunger to the target using the thread. The screw joint must either be secured with a screw locking compound (e.g. Loctite) or counter-screwed with the locknut supplied. When mounting, please ensure that the plunger remains freely movable in the sensor and that tilting is avoid. Observe the measuring tube position at the zero point (= 4 mA output).

##### Mounting Kit MBS 12/8

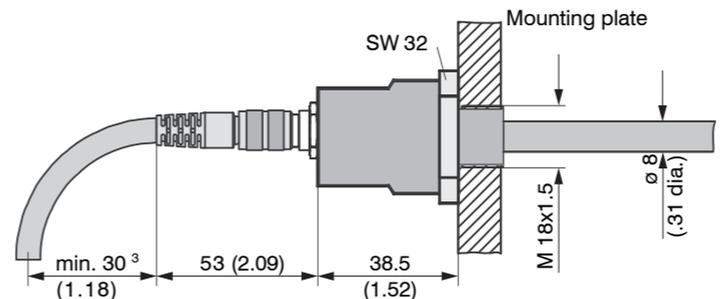


Sensor mounting with mounting kit MBS 12/8

#### Mounting of the Housing GA



Dimensional drawing housing GA, dimensions in mm (inches), not to scale



Mounting of the housing GA, dimensions in mm (inches), not to scale

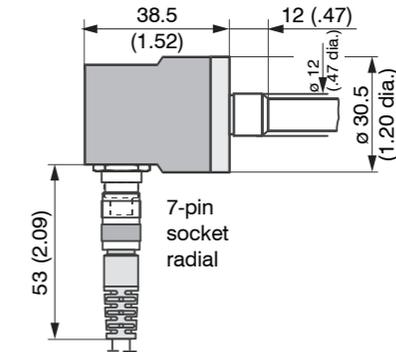
The sensor is screwed to the mounting plate using the M18 thread, see figure above.

Measuring range	A	B	C	D
50 (1.97)	77 (3.03)	M2	10 (.39)	50 (1.97)
100 (3.94)	138 (5.43)	M3	12 (.47)	100 (3.94)
200 (5.91)	261 (10.3)	M3	12 (.47)	200 (7.87)

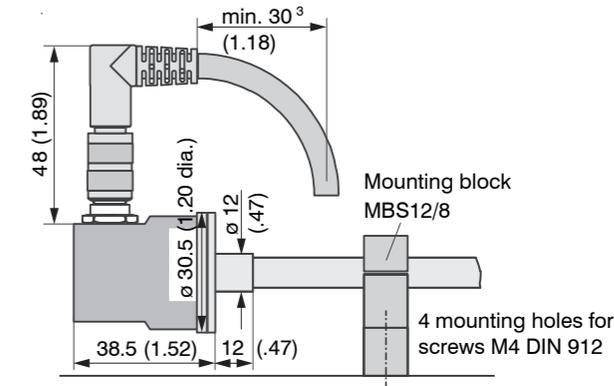
- 1) Plunger at start of measuring range,  $I_{OUT} = 4 \text{ mA}$
- 2) Plunger at end of measuring range,  $I_{OUT} = 20 \text{ mA}$
- 3) Bending radius sensor cable: > 30 mm (once) > 90 mm (repeated)

#### Mounting of the Housing ZA

The sensor is mounted with peripheral clamping on the sensor rod, see figure below. MICRO-EPSILON recommends to use the mounting set MBS 12/8, which is available as an accessory. At installation locations where there are no forces and vibrations the sensor can also be mounted by the sensor rod using radial point clamping with set screws. Plastic set screws must be used so that the sensor rod is not damaged or deformed.



Dimensional drawing housing ZA, dimensions in mm (inches), not to scale



Mounting of housing ZA

### Precautionary Measure

The plunger must not contact the sensor rod during operation.

> Damage to or destruction of the sensor through abrasion.

Avoid bending or shortening the plunger.

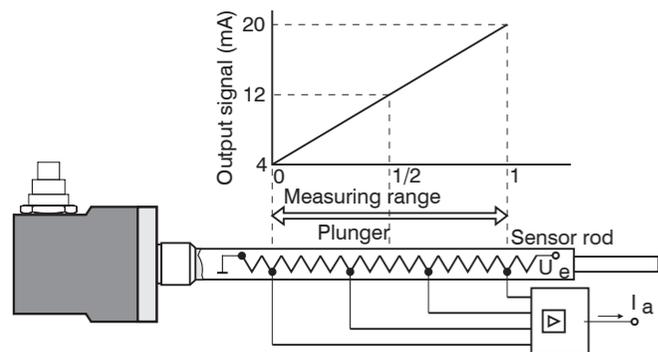
> Loss of specified technical data

The minimum bending radius is 30 mm (1.2 ") once, repeated: 90 mm (3.5 ") for the sensor cable C 703x.

> Damage to or destruction of the sensor cable

**i** The specified technical data are valid only, if the plunger supplied from MICRO-EPSILON is used!

### Measuring Principle



### Power Supply and Display / Output Device

Power supply and signal output are effected through the 7-pin. connector at the sensor's electronic housing. The pin assignment is shown in drawing and table stated below.



View: Solder pin side, female cable connector

Pin	Assignment	Color C703
1	Supply + (18 ... 30 VDC)	white
2	0 V Ground	brown
3	I <sub>OUT</sub> 4 ... 20 mA (U <sub>OUT</sub> 1 ... 5 V) <sup>1</sup>	green
4	Signal ground	yellow
5	SCL (sensor calibration)	gray
6	SDA (sensor calibration)	pink
7	not connected (n.c.)	blue

Pin and color assignment of 7-pin. connector and sensor cable C703-5 respectively C703-5/U

1) With sensor cable C703-5/U

**i** Make sure, that the output noise of the power supply units does not exceed 5 mV<sub>ss</sub><sup>1</sup> if the sensors are supplied through switched-mode power supply units.

Pin 2 is connected with pin 4 on the sensor electronics. The screen of the C703 sensor cable is connected with the connector housing. Connect the screen of the C703 sensor cable with the protective earth conductor on power side.

The sensors are connected according to the pin assignment, see opposite table and Figures "Signal monitoring". Notice the different criteria:

The maximum load resistor R<sub>L</sub> is limited by the operating voltage U<sub>B</sub>.

$$R_{L \max} = \frac{(U_B - 10 \text{ V})}{20 \text{ mA}}$$

A small load resistor increases the thermal load of the sensor electronics. With a maximum operating temperature of 85 °C (+185 °F), the minimum permitted load resistor R<sub>L</sub> is calculated as:

$$R_{L \min} = \frac{82.5 \text{ Ohm} \cdot U_B}{V} - 1625 \text{ Ohm} \text{ (If the result is negative: } R_L = 0 \Omega \text{)}$$

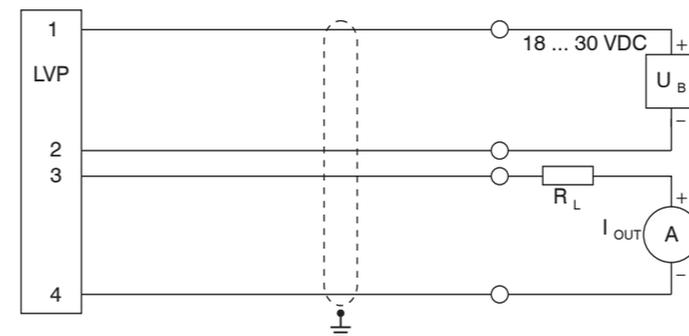
With a preset load resistor the maximum permitted operating temperature is calculated as:

$$T_{\max} = 150 \text{ °C} - \frac{3.3 \text{ °C} \cdot U_B}{V} + \frac{0.04 \text{ °C} \cdot R_L}{\text{Ohm}}; \text{ Note: } T_{\max} \leq 85 \text{ °C}$$

R<sub>L</sub> = Load resistor

U<sub>B</sub> = Operating voltage

T<sub>max</sub> = Maximum operating temperature

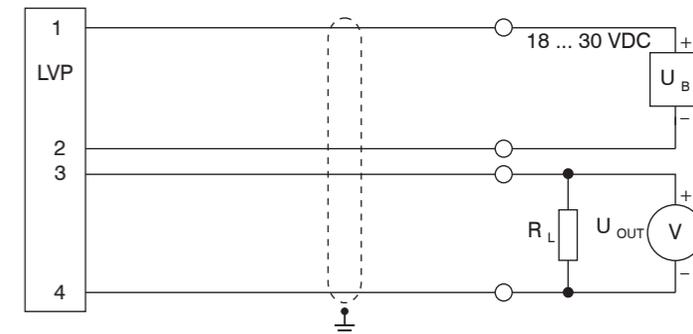


Signal monitoring with amperemeter

**i** R<sub>L</sub> can be inserted as an option to adapt the power loss to high ambient temperatures.

If the signal is monitored with a voltmeter, the load resistor R<sub>L</sub> is dimensioned in accordance with the desired output voltage U<sub>OUT</sub>

$$\text{Formula: } U_{\text{OUT}} = R_L \cdot I_{\text{Signal}}$$



Signal monitoring with load resistor and voltmeter

R<sub>L</sub> = Load resistor

U<sub>B</sub> = Operating voltage

T<sub>max</sub> = Maximum operating temperature

More information about the sensor can be read in the instruction manual. You will find these online at:  
[www.micro-epsilon.de/download/manuals/man--induSENSOR-Serie-LVP--de-en.pdf](http://www.micro-epsilon.de/download/manuals/man--induSENSOR-Serie-LVP--de-en.pdf)