

Assembly Instructions induSENSOR, VIP series

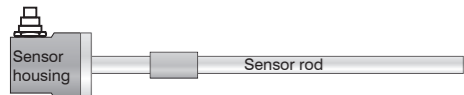
Warnings

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 sensor rod.
- > Damage to or destruction of the sensor



Notes on CE Identification

The following applies for the induSENSOR, VIP series:

EC regulation 2004/108/EC

The induSENSOR, VIP series, satisfies the requirements of the standards EN 61326-1: 2006-10 and DIN 61326-2-3: 2007-05.

Proper Environment

- Protection class for sensor: IP 67 (only with plug connected)
- Operating temperature: -40 up to +85 °C (RL ≤ 500 Ohm) -40 to +185 °F
- Storage temperature: -40 up to +100 °C (-40 up 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

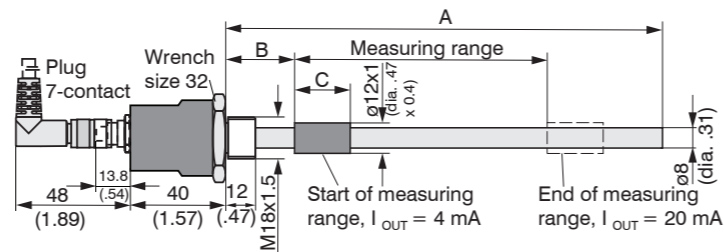
Centering and Mounting the Measuring Ring

Install the measuring ring in an electrically non-conductive mounting facility (e.g. plastics). The dimensions of the measuring ring are shown in the following figures. MICRO-EPSILON recommends to use the mounting kit MBS 12/8, which is available as an accessory, see Chap. 8.1 of the instruction manual and Figure "Sensor mounting with mounting kit MBS 12/8". Please observe the position of the measuring ring at the zero point (= 4 mA output), see also the following figures.

A slightly eccentric mounting of the measuring ring has no negative influence on the sensor signal. The measuring ring is attached on the target to be measured by means of circumferential clamping or gluing.

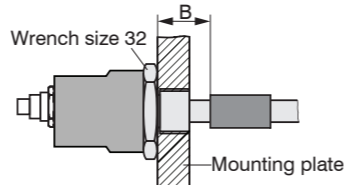
i An electrically conductive mounting material (e.g. measuring ring mounting facility) influences the measuring result. The specified technical data are no longer observed!

Mounting of the Housing GA



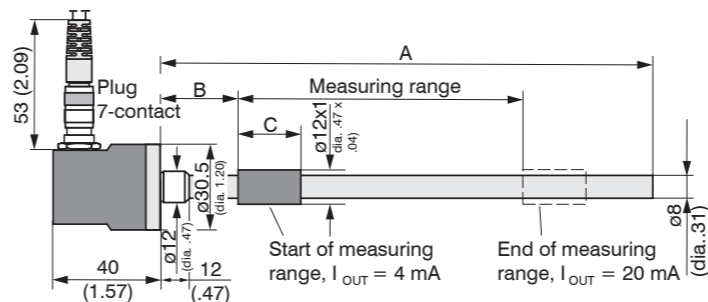
Dimensional drawing housing GA, dimensions in mm (inches), not to scale

The sensor is screwed to the mounting plate using the M18 thread, see figure on the right side.



Mounting of the Housing ZA

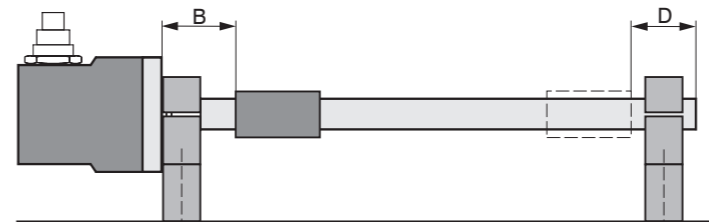
The sensor is fastened at both ends of the sensor rod (area B and D, see the lower figure) by means of a clamping / mounting facility.



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

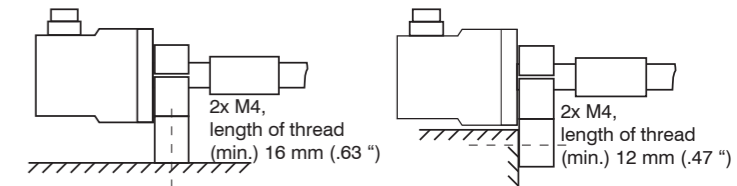
Bending radius sensor cable:

- > 30 mm (once)
- > 90 mm (permanent)



Measuring range	A	B	C	D
50 (1.97)	105 (4.13)	24 (.94)	11.5 (.45)	19.5 (.77)
100 (3.94)	175 (6.89)	27 (1.06)	22 (.87)	26 (1.02)
150 (5.91)	242 (9.53)	30 (1.18)	33 (1.30)	29 (1.14)

Mounting Kit MBS 12/8



Sensor mounting with mounting kit MBS 12/8

Precautionary Measure

The measuring ring must not contact the sensor rod during operation.

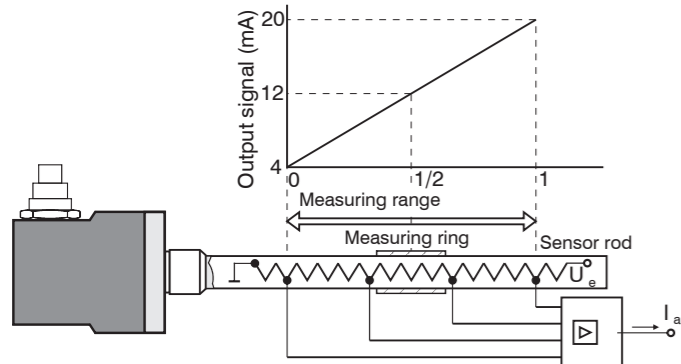
- > Damage to or destruction of the sensor through abrasion.
- Avoid bending or shortening the measuring ring.
- > Loss of specified technical data

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

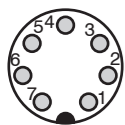
i The specified technical data are valid only, if the measuring ring is used supplied from MICRO-EPSILON!

Measuring Principle



Power Supply and Display / Output Device

Power supply and signal output are effected through the 7-contact 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_{OUT} 4 ... 20 mA (U_{OUT} 1 ... 5 V) ¹	green
4	Signal ground	yellow
5	SCL (sensor calibration)	grey
6	SDA (sensor calibration)	pink
7	not connected (n.c.)	blue

Pin and color assignment of the connector and sensor cable C703-5 respectively C703-5/U

¹) With sensor cable C703-5/U

Make sure, that the output noise of the power supply units does not exceed 5 mV_{ss} 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 criterions:

The maximum load resistor R_L is limited by the operating voltage U_B .

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

A small load resistor loads the sensor electronics more thermal. With a maximum operating temperature of $85 \text{ }^\circ\text{C}$ ($+185 \text{ }^\circ\text{F}$) the minimum load resistor R_L permitted is calculated as:

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

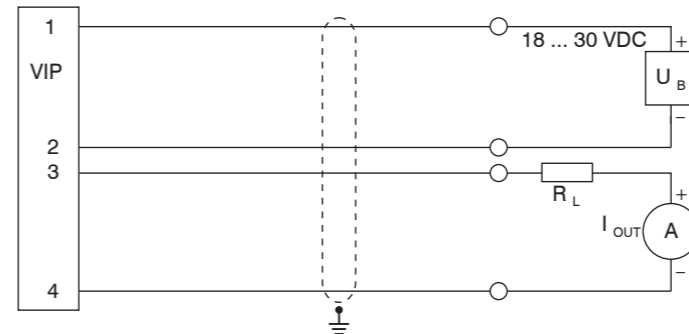
With a preset load resistor the maximum operating temperature permitted is calculated as:

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

R_L = Load resistor

U_B = Operating voltage

T_{\max} = Maximum operating temperature

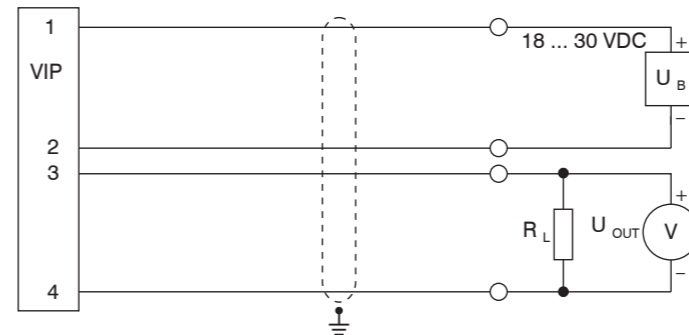


Signal monitoring with amperemeter

R_L can be inserted as an option for adaptation of the power loss to high ambient temperatures.

If the signal is monitored with a voltmeter, the load resistor R_L is dimensioned in accordance with the desired output voltage U_{OUT} .

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



Signal monitoring with load resistor and voltmeter

R_L = Load resistor

U_B = Operating voltage

T_{\max} = Maximum operating temperature

Read the detailed instruction manual before using the sensor. The manual is available online on:
www.micro-epsilon.com/download/manuals/man--induSENSOR-Serie-VIP--de-en.pdf