

# Mounting instructions - Ship- building

## VEGAFLEX 81

Cargo tank (crude oil)

Waste oil tank

Service tanks (heavy oil, cooling water tank)

Ballast tanks (wing tanks)



Document ID: 39154



# VEGA

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## 1 General information

### 1.1 General instructions

This mounting instructions manual provides the necessary guidelines for correct mounting of level sensors VEGAFLEX 81 on ships.

The mounting instructions manual applies to the following sensors with ship approval:

- VEGAFLEX 81 .CM...
- VEGAFLEX 81 .DM...
- VEGAFLEX 81 .XM...

Take note of the type label of the sensor. Only the abovementioned versions meet the special requirements for use on ships. The type label is located on the instrument housing.

To ensure proper functioning of the instrument, take careful note of all the information in this mounting instructions manual.

Mount the VEGAFLEX 81 exactly according to the instructions in this manual.

Read this manual before selecting the mounting position. Take note of existing installations and discuss the mounting with the shipyard technicians.

Make all necessary information on the mounting position and installation conditions available to the shipyard.

You can find further information on technical data or setup in the operating instructions of VEGAFLEX 81. This manual comes with the instrument.



When using in hazardous areas take note of all relevant technical data and special regulations of the Ex-specific safety instructions of VEGAFLEX 81 as well as possible devices that supply power. The approval documents are part of the scope of delivery for instruments with Ex approval.

### 1.2 Type label

The type label contains the most important data for identification and use of the instrument:

#### Type label

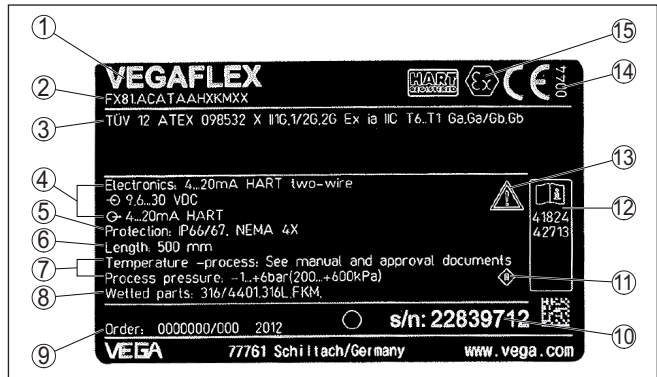


Fig. 1: Layout of the type label (example)

- 1 Instrument type
- 2 Product code
- 3 Approvals
- 4 Power supply and signal output, electronics
- 5 Protection rating
- 6 Probe length
- 7 Process and ambient temperature, process pressure
- 8 Material wetted parts
- 9 Hardware and software version
- 10 Order number
- 11 Serial number of the instrument
- 12 Symbol of the device protection class
- 13 ID numbers, instrument documentation
- 14 Reminder to observe the instrument documentation
- 15 Notified authority for CE marking
- 16 Approval directives

### 1.3 Measuring range

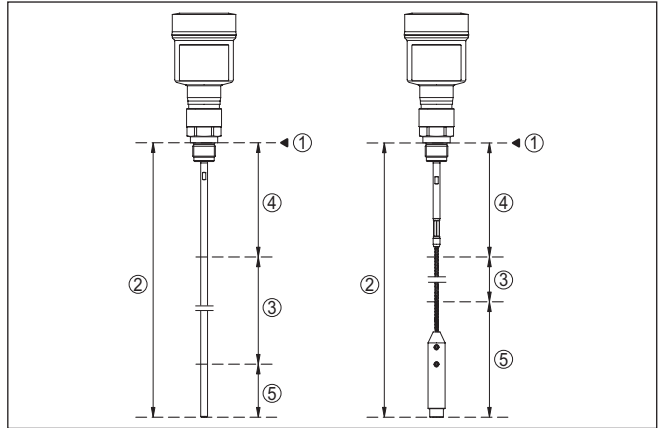


Fig. 2: Measuring ranges - VEGAFLEX 81

- 1 Reference plane
- 2 Probe length L
- 3 Measuring range (default setting refers to the measuring range in water)
- 4 Upper blocking distance (in this area no measurement is possible)
- 5 Lower blocking distance (in this area no measurement is possible)

## 2 Mounting, in general

### 2.1 Suitable housing versions

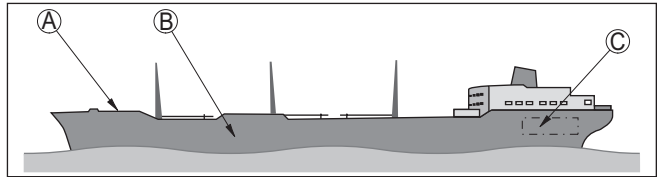


Fig. 3: Areas on a ship - side view

- A On deck
- B Below deck
- C Engine room

	Plastic housing	Aluminium housing	Stainless steel housing (precision casting)
On deck	No	No	Yes
Below deck	Yes	No	Yes
Engine room	Yes	No	Yes

Tab. 1: Suitable housings for different areas of the ship

### 2.2 Installation on deck with protective cover

	Housing	Protective cover closed	Protective cover vented
Plastic			
Aluminium die-casting			
Stainless steel housing 316L (IP68, 0.2 bar)			

Cable gland for cable diameters of 7 ... 12 mm. An additional seal for cable diameters of 10 ... 14 mm is included.

**Adapter for protective hose**

**2.3 Installation on deck without protective cover**

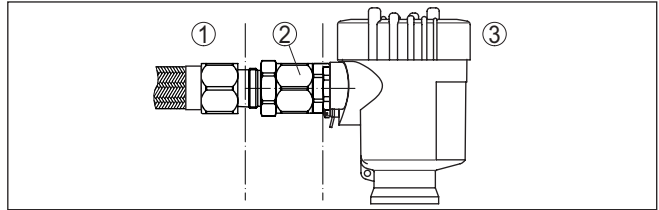


Fig. 4: Adapter for protective hose

- 1 Installation by shipyard
- 2 Adapter for protective hose - M20 x 1.5 to M24 x 1.5
- 3 Housing stainless steel, precision casting 316L, 0.2 bar with adapter for protective hose

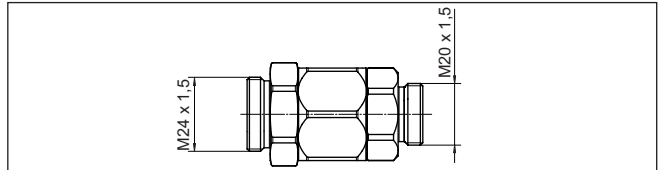


Fig. 5: Adapter for protective hose - M20 x 1.5 to M24 x 1.5

Cable gland for cable diameters of 13 mm, additional seal for cable diameters of 9 ... 11 mm is attached.

**Stainless steel housing IP68, 1 bar**

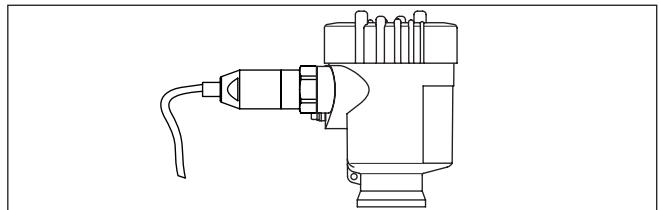


Fig. 6: Housing stainless steel, precision casting 316L IP68, 1 bar with VEGA cable outlet

Stainless steel housing IP68, 1 bar with cable outlet (PUR) and capillaries for pressure transmitters.

### 3 Mounting - standard

#### 3.1 Actuating variables

##### General information

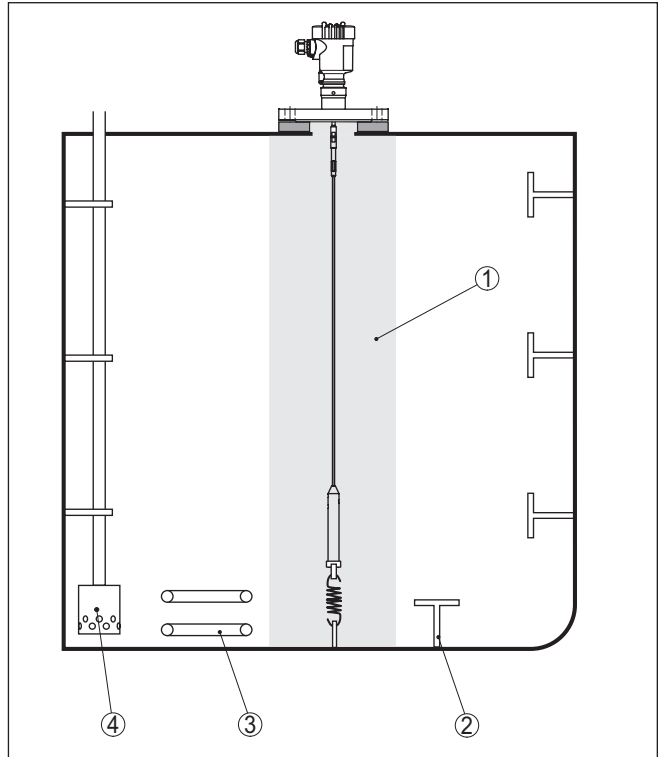


Fig. 7: VEGAFLEX 81 - Mounting

- 1 Energy field
- 2 Container frame
- 3 Heating coil
- 4 Pump

High frequency microwave pulses are guided along a steel cable or rod.

The microwave pulses generate an energy field with a radius of approximately 300 mm (11.81 in) around the sensor cable.

Installations within this energy field influence the measurement.

##### Process fitting

If possible, avoid vessel sockets. Mount the sensor flush to the vessel ceiling.

If this is not possible, use short nozzles with small diameter.



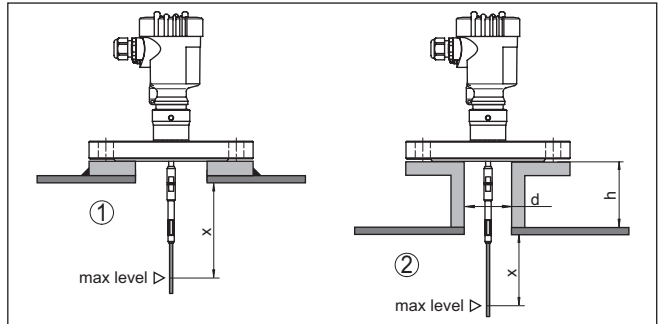


Fig. 8: Mounting options

1 Flush mounting

2 Socket mounting

*x* Upper blocking distance (no measurement possible in this area)

*h* Socket height

*d* Socket diameter

Keep in mind that a min. distance must be maintained below the reference plane - measurement is not possible here (dead band).

The value *x* states the max. upper value of the measuring range as distance to the level. This value depends on the medium.

Medium	<i>x</i>
Water	80 mm (3.15 in)
Oil, bitumen	150 mm (5.91 in)
Solvents	150 mm (5.91 in)

If a nozzle is required, you can find the optimised dimensions *d* and *h* in the following table.

<i>d</i>	<i>h</i>
DN 50 ... DN 150	150 mm (5.91 in)
DN 150 ... DN 200	100 mm (3.94 in)

Mounting details of the socket

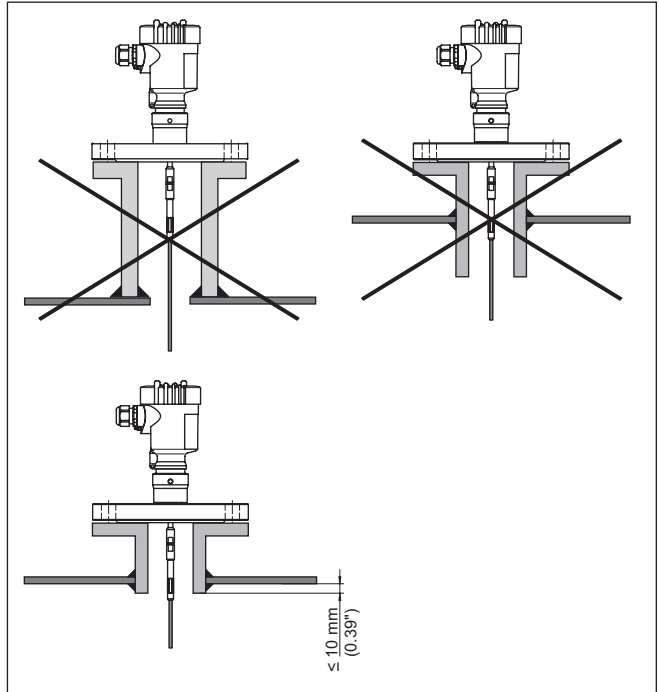


Fig. 9: Mounting details of the socket

**Tank socket**

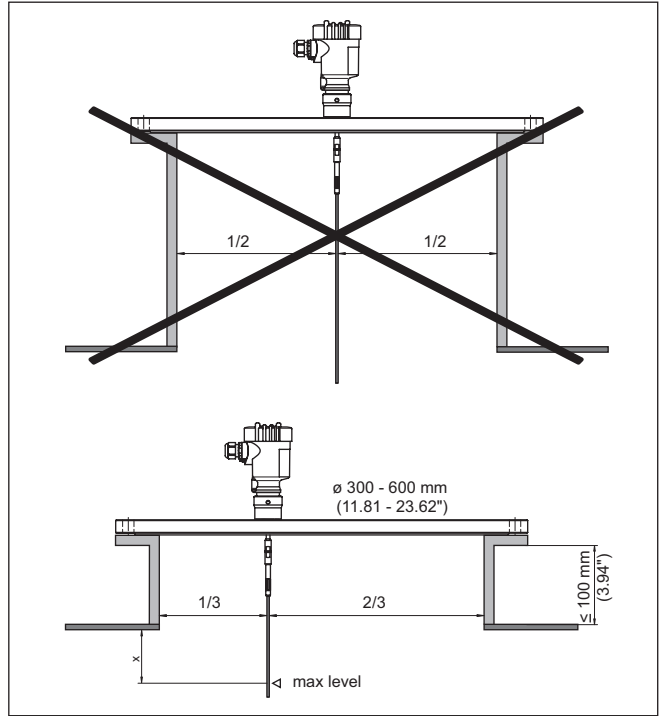


Fig. 10: Mounting on a tank socket  $\varnothing$  300 ... 600 mm (11.81 ... 23.62 in)  
 x Upper blocking distance (no measurement possible in this area)

**3.2 Distance to vessel installations**

Keep a min. distance to vessel installations or the vessel wall to avoid adverse effects on the measurement. The probe must not touch installations or the vessel wall during operation. If necessary, secure the probe end.

## Distance to the vessel wall and to frame profiles

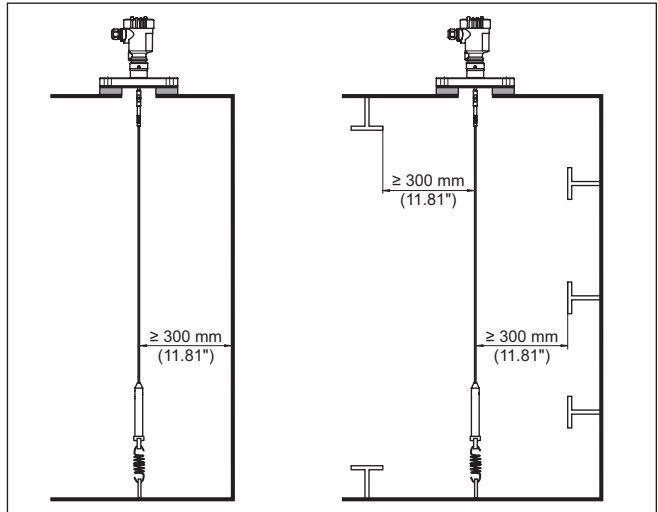


Fig. 11: Avoid interference from the vessel wall and frame profiles

- 1 Vessel wall
- 2 Frames, reinforcement profiles, etc.

**Distances to cavities and filling streams**

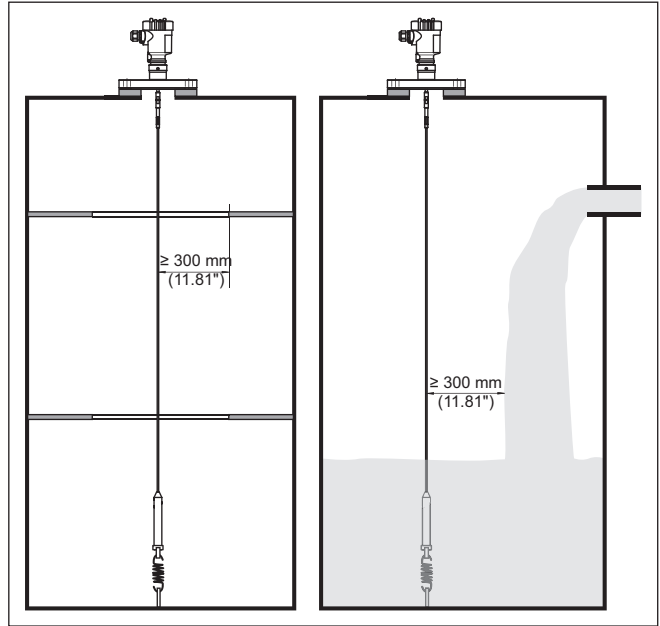


Fig. 12: Avoid interference from cavities and filling streams

- 1 Cavity
- 2 Filling stream

**Distances with strain relief**

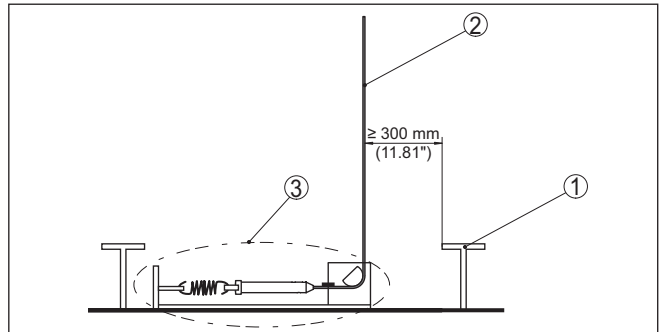


Fig. 13: Strain relief - distances to frame profiles on the vessel bottom

- 1 Frame
- 2 Sensor cable
- 3 Configuration of the strain relief, side view

Keep a min. distance to heating coils in the vessel to avoid adverse effects on the measurement.

The fixing facility can only be used up to a maximum medium temperature of 160 °C (320 °F).

### Distances to heating coils (top view)

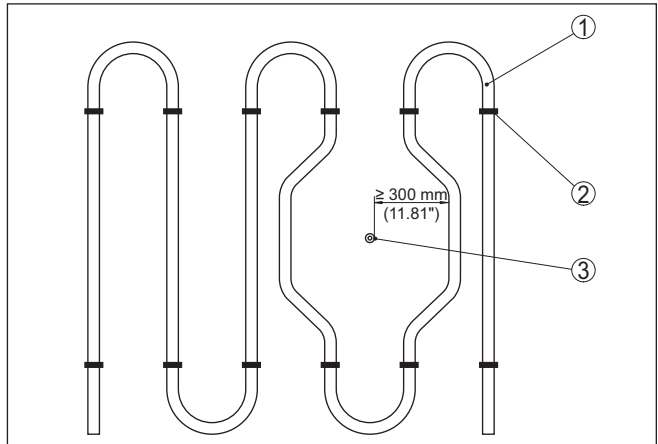


Fig. 14: Heating coils - top view

- 1 Heating coils
- 2 Bearing
- 3 Sensor cable

### Distances to heating coils (side view)

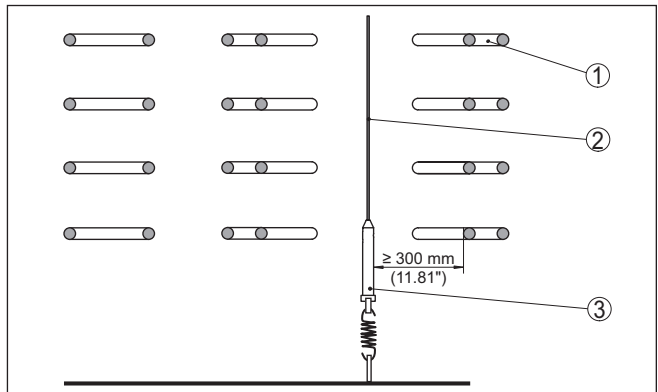


Fig. 15: Heating coils - side view

- 1 Heating coil
- 2 Sensor cable
- 3 Gravity weight

## 3.3 Ways of fastening the probe

The min. level **min** depends on the height of the mounting facility **z** and the offset of the medium **y**.

**Strain relief - vertically**

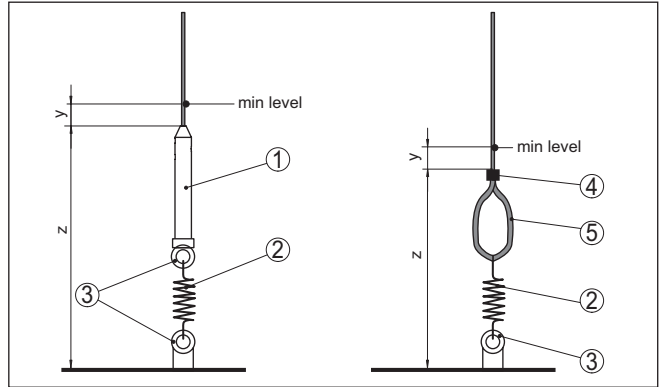


Fig. 16: Mounting versions vertically - gravity weight (left), cable loop (right)

- 1 Gravity weight
- 2 Spring
- 3 Tension bolt
- 4 Cable loop
- 5 Grommet
- y Offset
- z Height of the fastening arrangement

**Strain relief - horizontal**

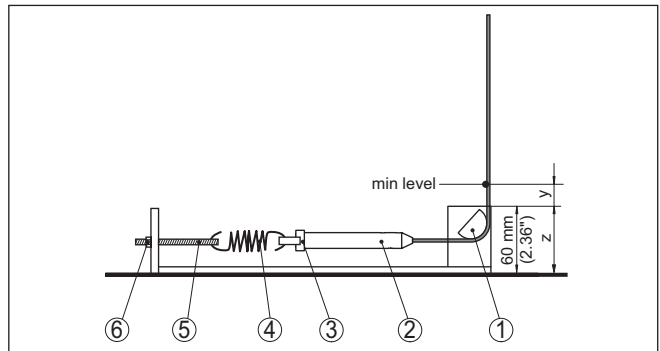


Fig. 17: Mounting version horizontal, side view

- 1 Pulley
- 2 Gravity weight
- 3 Tension bolt
- 4 Spring
- 5 Threaded rod for straining
- 6 Nut
- y Offset
- z Height of the fastening arrangement

Medium	y
Water	10 mm (0.79 in)

Medium	y
Oil, bitumen	40 mm (3.15 in)
Solvents	40 mm (3.15 in)

Keep in mind that a min. distance must be maintained below the reference plane - measurement is not possible here (dead band).

The value **y** states the min. lower value of the measuring range. This value depends on the medium.

Add the height of the mounting facility **z** and the offset of the medium **y**, to calculate the total blocking distance.



## 4 Mounting in a standpipe

### 4.1 Mounting - cable version

In narrow tanks or in case of a distance to vessel installations of less than 300 mm (11.81 in), measurement in a standpipe is recommended.

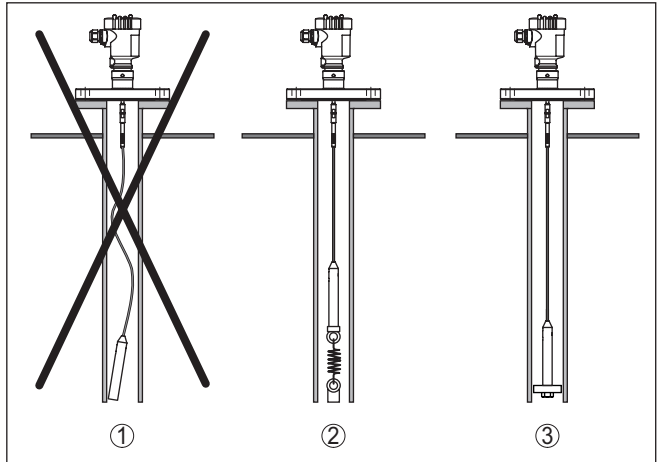


Fig. 18: Measurement in a standpipe

- 1 The sensor cable must not touch the vessel wall
- 2 Standpipe mounting with gravity weight and spring
- 3 Standpipe mounting with gravity weight and centering disk

The sensor cable must be tightly stretched with a gravity weight or spring. The measurement will not function if the sensor cable touches the inner wall of the standpipe.

Mounting with gravity weight

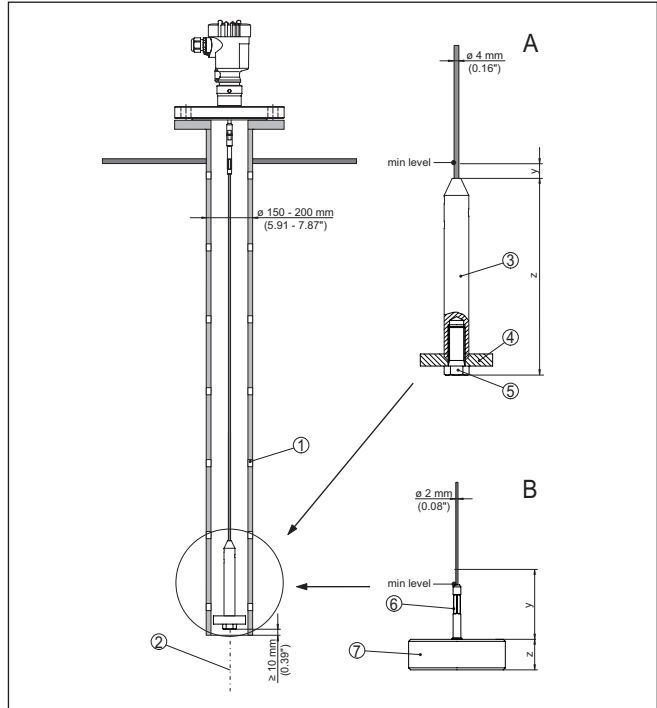


Fig. 19: Mounting versions

- 1 Ventilation openings
- 2 Standpipe - vertically mounted - max. deviation 10 mm (0.4 in)
- 3 Gravity weight
- 4 Washer for centering and straining the sensor cable
- 5 Screw
- 6 Sensor cable - cannot be shortened
- 7 Washer for centering and straining the sensor cable
- A Gravity weight with small centering disk
- B Gravity weight with big centering disk - cannot be shortened

Medium	y
Water	10 mm (0.79 in)
Oil, bitumen	40 mm (3.15 in)
Solvents	40 mm (3.15 in)

Keep in mind that a min. distance must be maintained below the reference plane - measurement is not possible here (dead band).

The value **y** states the min. lower value of the measuring range. This value depends on the medium.

Add the height of the mounting facility **z** and the offset of the medium **y**, to calculate the total range that cannot be measured.



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All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.

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