



# Product information

## Hydrostatic

### Submersible pressure transmitter

VEGABAR 86

VEGABAR 87

VEGAWELL 52



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### Take note of safety instructions for Ex applications



Please note the Ex specific safety information that you can find at [www.vega.com](http://www.vega.com) and that comes with each instrument. In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units. The sensors must only be operated on intrinsically safe circuits. The permissible electrical values are stated in the certificate.

# 1 Measuring principle

## 1.1 Basic function

The pressure of the measured medium acts on the pressure measuring cell, converting this pressure into an electronic signal. The ceramic-capacitive CERTEC® and MINI-CERTEC® as well as the metallic METEC®, piezo and strain gauge measuring cells are used.

## 1.2 Measuring cell technology

### VEGABAR 86

The sensor element is the ceramic CERTEC® measuring cell with front-flush, abrasion-resistant ceramic diaphragm.

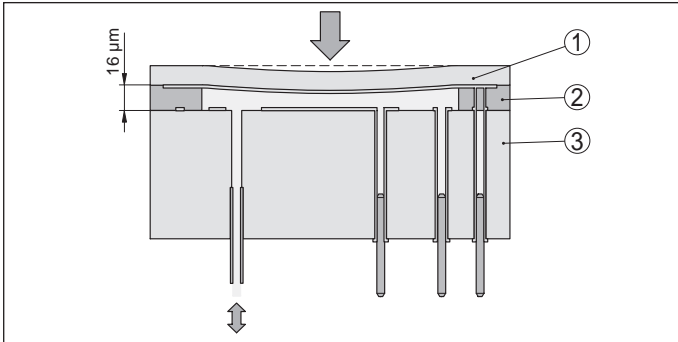


Fig. 1: Configuration of the CERTEC® measuring cell in VEGABAR 86

- 1 Diaphragm
- 2 Soldered glass bond
- 3 Base element

The CERTEC® measuring cell is also equipped with a temperature sensor. The temperature value can be displayed via the display and adjustment module or processed via the signal output.

### VEGABAR 87

The METEC® measuring cell is the sensor element. It consists of the ceramic-capacitive CERTEC® measuring cell and a special, temperature-compensated chemical seal system.

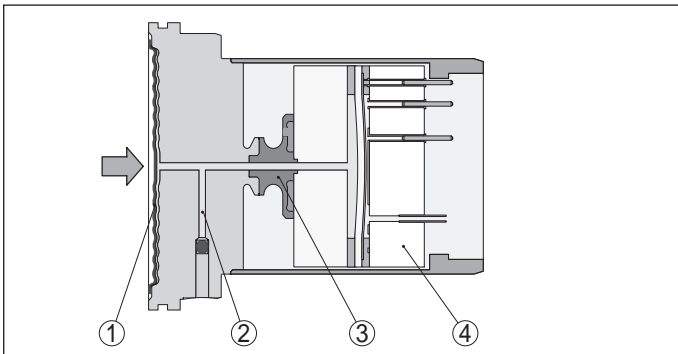


Fig. 2: Configuration of the METEC® measuring cell in VEGABAR 87

- 1 Process diaphragm
- 2 Isolating liquid
- 3 FeNi adapter
- 4 CERTEC® measuring cell

### VEGAWELL 52

The sensor element is the ceramic CERTEC® measuring cell with front-flush, abrasion-resistant ceramic diaphragm.

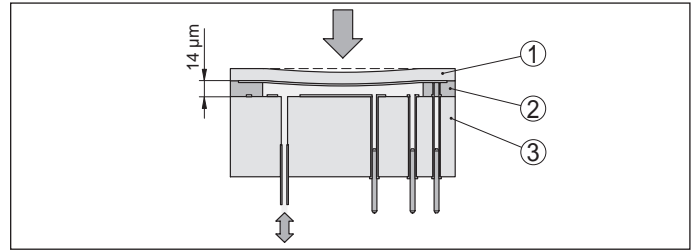


Fig. 3: Configuration of the CERTEC® measuring cell in VEGAWELL 52

- 1 Diaphragm
- 2 Soldered glass bond
- 3 Base element

VEGAWELL 52 is also equipped with a temperature sensor Pt 100. The resistance value can be processed via an external temperature transmitter.

## 2 Type overview

VEGABAR 86



VEGABAR 87



VEGAWELL 52



Measuring cell	CERTEC®	METEC®	CERTEC®
Material diaphragm	Al <sub>2</sub> O <sub>3</sub> ceramic	Alloy C276	Al <sub>2</sub> O <sub>3</sub> ceramic
Media	Liquids, also with abrasive content	gas, vapours and liquids, also viscous	Liquids, also with abrasive content
Process fitting	Straining clamp, unassembled threaded fitting from G1½, thread G1½, flanges from DN 50	Straining clamp, unassembled threaded fitting from G1½, thread G1½, flanges from DN 50	Straining clamp, unassembled threaded fitting G1, thread G1½
Material Suspension cable/Connection tube	PE, PUR, FEP, 316L	FEP, 316L	PE, PUR, FEP
Material, transmitter	316L, PE-coating, PVDF	316L	316L
Measuring cell seal	FKM, EPDM, FFKM	-	FKM, EPDM, FFKM
Isolating liquid	Dry measuring system	Medical white oil	Dry measuring system
Measuring range	0 ... +25 bar/0 ... +2500 kPa (-14.5 ... +362.6 psig)	0 ... +25 bar/0 ... +2500 kPa (-14.5 ... +362.6 psig)	0 ... +25 bar/0 ... +2500 kPa (-14.5 ... +362.6 psig)
Smallest measuring range	0.025 bar/2.5 kPa (1.45 psig)	0.1 bar/10 kPa (1.45 psig)	0.1 bar/10 kPa (1.45 psig)
Process temperature	-40 ... +100 °C (-40 ... +212 °F)	-12 ... +100 °C (+10.4 ... +212 °F)	-20 ... +80 °C (-4 ... +176 °F)
Deviation	< 0.1 %; < 0.2 %	< 0.1 %; < 0.2 %	< 0.1 %; < 0.2 %
Signal output	<ul style="list-style-type: none"> <li>● 4 ... 20 mA</li> <li>● 4 ... 20 mA/HART</li> <li>● PA</li> <li>● FF</li> <li>● Modbus</li> </ul>	<ul style="list-style-type: none"> <li>● 4 ... 20 mA</li> <li>● 4 ... 20 mA/HART</li> <li>● PA</li> <li>● FF</li> <li>● Modbus</li> </ul>	<ul style="list-style-type: none"> <li>● 4 ... 20 mA</li> <li>● 4 ... 20 mA/HART</li> </ul>
Additional interface	Digital interface for Slave-Master combination	Digital interface for Slave-Master combination	Voltage supply/Processing temperature sensor Pt 100
Indication/Adjustment	<ul style="list-style-type: none"> <li>● PLICSCOM</li> <li>● PACTware</li> <li>● VEGADIS 81</li> <li>● VEGADIS 82</li> </ul>	<ul style="list-style-type: none"> <li>● PLICSCOM</li> <li>● PACTware</li> <li>● VEGADIS 81</li> <li>● VEGADIS 82</li> </ul>	<ul style="list-style-type: none"> <li>● PACTware</li> <li>● VEGADIS 82</li> </ul>
Approvals	<ul style="list-style-type: none"> <li>● SIL</li> <li>● Shipbuilding</li> <li>● ATEX</li> <li>● IEC</li> <li>● Overfill protection</li> <li>● FM</li> <li>● CSA</li> <li>● EAC (GOST)</li> </ul>	<ul style="list-style-type: none"> <li>● SIL</li> <li>● Shipbuilding</li> <li>● ATEX</li> <li>● IEC</li> <li>● Overfill protection</li> <li>● FM</li> <li>● CSA</li> <li>● EAC (GOST)</li> </ul>	<ul style="list-style-type: none"> <li>● Overfill protection</li> <li>● Shipbuilding</li> <li>● ATEX</li> <li>● IEC</li> <li>● Overfill protection</li> </ul>

### 3 Instrument selection

#### Application area

The hydrostatic pressure transmitters VEGAWELL and VEGABAR were especially developed to measure levels in a wide range of liquids with different properties. Measurement of the product temperature is also possible.

#### VEGABAR 86

VEGABAR 86 is a submersible pressure transmitter for level measurement in wells, basins and open vessels. Great flexibility through the use of different cable and tube versions allows VEGABAR 86 to be employed in many different applications.

#### VEGABAR 87

VEGABAR 87 is a pressure transmitter for pressure and level measurement of liquids and viscous products in the chemical, food processing and pharmaceutical industries. VEGABAR 87 can be used for extremely small measuring ranges  $\geq 0.1$  bar.

#### VEGAWELL 52

VEGAWELL 52 lends itself well for continuous level measurement of liquids. Typical applications are measurements in water/waste water facilities, in deep wells and in the shipbuilding industry.

#### Configuration and housing protection classes

The pressure transmitters VEGABAR 86 and 87 are available in different versions. The following illustration shows typical examples.

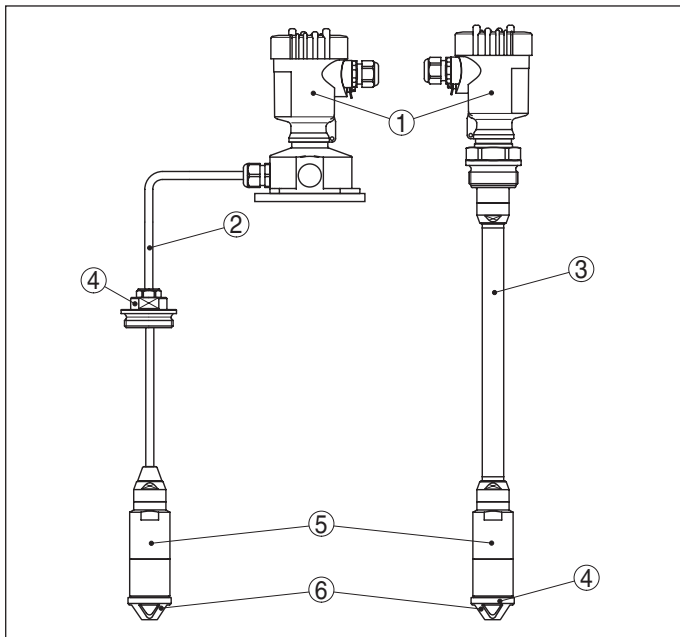


Fig. 7: Examples of a VEGABAR 86 with suspension cable (left) and connection tube (right)

- 1 Housing with integrated electronics
- 2 Suspension cable
- 3 Connection tube
- 4 Threaded fitting
- 5 Transmitter
- 6 Protective cap

#### Measured variables

The submersible pressure transmitters VEGABAR 86, 87 as well as VEGAWELL 52 are suitable for hydrostatic level measurement.

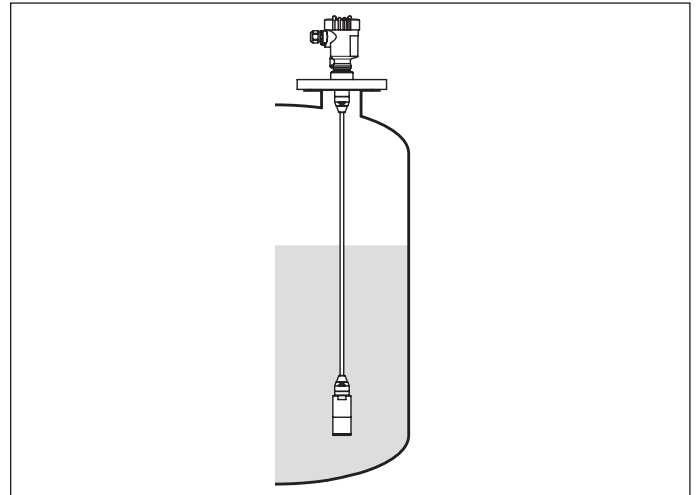


Fig. 8: Measurement setup for level measurement

In conjunction with a slave sensor, VEGABAR 86 and 87 are suitable for electronic differential pressure measurement of:

- Level, pressurized
- Level difference
- Flow
- Density
- Interface

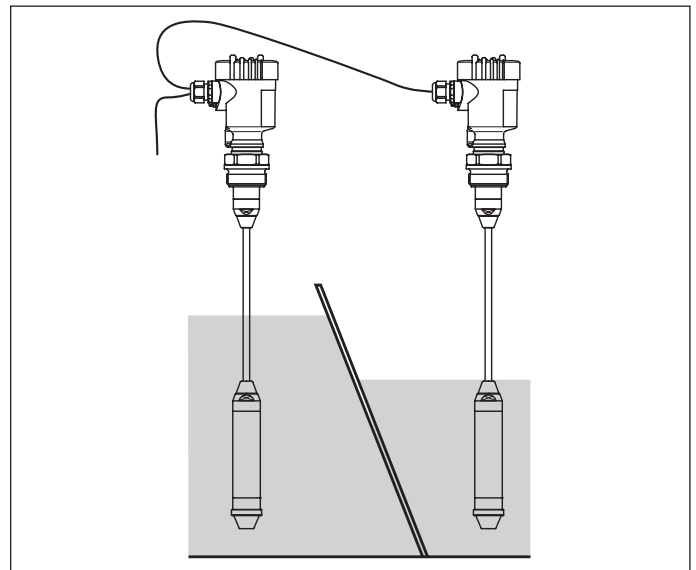






Fig. 9: Electronic level difference measurement through Master/Slave combination




## 4 Selection criteria



		VEGABAR 86	VEGABAR 87	VEGAWELL 52
Wear through the medium	Aggressive products	-	●	-
	Abrasive products	●	-	●
Product temperature up to	+80 °C (+176 °F)	●	●	●
	+100 °C (+212 °F)	●	●	-
Output, product temperature	Through display, signal output	●	-	●
	Through external temperature transmitter	-	-	●
Measuring system	Dry	●	-	●
	Oil-filled	-	●	-
Suitability for electronic differential pressure measurement		●	●	-
Suitability for use in sounding tubes	Inner diameter 1"	-	-	●
	Inner diameter 1 1/2"	●	●	●
Integrated overvoltage protection	Standard	-	-	●
	Option	●	●	-
Suitability for industry-specific applications	Paper	●	●	-
	Shipbuilding	●	-	●
	Environment and recycling industry	●	●	●
	Water/Waste water	●	-	●

### 5 Housing overview VEGABAR 86, 87

<b>Plastic PBT</b>		
<b>Protection rating</b>	IP 66/IP 67	IP 66/IP 67
<b>Version</b>	Single chamber	Double chamber
<b>Application area</b>	Industrial environment	Industrial environment

<b>Aluminium</b>		
<b>Protection rating</b>	IP 66/IP 67, IP 66/IP 68 (1 bar)	IP 66/IP 67, IP 66/IP 68 (1 bar)
<b>Version</b>	Single chamber	Double chamber
<b>Application area</b>	Industrial environment with increased mechanical stress	Industrial environment with increased mechanical stress

<b>Stainless steel 316L</b>			
<b>Protection rating</b>	IP 66/IP 67	IP 66/IP 67, IP 66/IP 68 (1 bar)	IP 66/IP 67, IP 66/IP 68 (1 bar)
<b>Version</b>	Single chamber, electropolished	Single chamber, precision casting	Double chamber, precision casting
<b>Application area</b>	Aggressive environment, food processing, pharmaceutical	Aggressive environment, extreme mechanical stress	Aggressive environment, extreme mechanical stress

<b>Separate version</b>		
<b>Material</b>	Stainless steel 316L	Plastic PBT
<b>Protection rating</b>	IP 68 (25 bar)	IP 65
<b>Function</b>	Transmitter	External electronics
<b>Application area</b>	Extremely moist environment	Industrial environment

## 6 Mounting

### Installation position

The suspension cable versions must be mounted in a calm area or in a suitable protective tube. This avoids lateral movements of the transmitter and the resulting distortion of measurement data.

The suspension cable contains, apart from the connection cables and the suspension wire, also the capillaries for atmospheric pressure compensation.

### Mounting examples and measurement setups

The following illustrations show mounting examples and measurement setups.

#### Level measurement

The VEGABAR measures the level in a vessel.

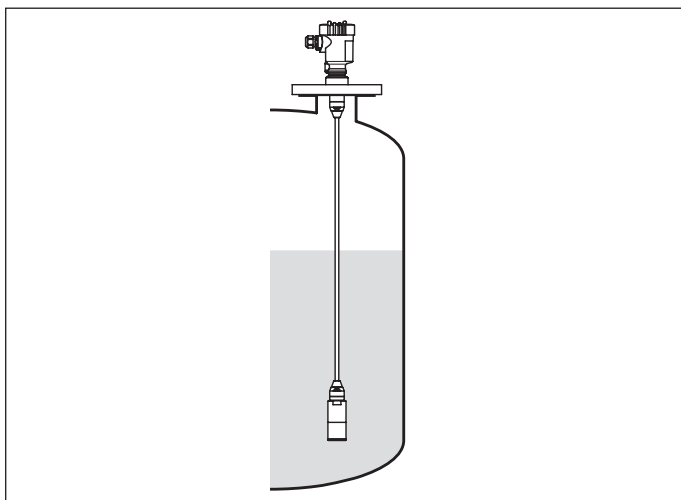


Fig. 19: Level measurement with VEGABAR



## 7 Electronics - 4 ... 20 mA - Two-wire VEGABAR 86, 87

### Configuration of the electronics

The plug-in electronics is mounted in the electronics compartment of the instrument and can be exchanged by the user when servicing is required. The electronics is completely encapsulated to protect against vibration and moisture.

The terminals for voltage supply as well as the contact pins with I<sup>2</sup>C interface for parameter adjustment are located on the upper side of the electronics. In the double-chamber housing, the terminals are located in the separate terminal compartment.

### Voltage supply

Power supply and current signal are carried on the same two-wire cable. The operating voltage can differ depending on the instrument version.

You can find the data of the voltage supply in chapter "Technical data" in the operating instructions manual of the respective instrument.

Provide a reliable separation between the supply circuit and the mains circuits according to DIN EN 61140 VDE 0140-1.

Specifications of the voltage supply:

- Operating voltage
  - 9.6 ... 35 V DC
- Permissible residual ripple - Non-Ex, Ex-ia instrument
  - for U<sub>N</sub> 12 V DC: ≤ 0.7 V<sub>eff</sub> (16 ... 400 Hz)
  - for U<sub>N</sub> 24 V DC: ≤ 1.0 V<sub>eff</sub> (16 ... 400 Hz)
- Permissible residual ripple - Ex-d-ia instrument
  - for U<sub>N</sub> 24 V DC: ≤ 1.0 V<sub>eff</sub> (16 ... 400 Hz)

Keep in mind the following additional factors that influence the operating voltage:

- Lower output voltage of the power supply unit under nominal load (e.g. with a sensor current of 20.5 mA or 22 mA in case of fault)
- Influence of additional instruments in the circuit (see load values in chapter "Technical data" of the operating instructions of the respective instrument)

### Connection cable

The instrument is connected with standard two-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326-1 for industrial areas, screened cable should be used.

### Cable screening and grounding

If screened cable is required, we recommend connecting the cable screen on both ends to ground potential. In the sensor, the screen must be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the ground potential (low impedance).

### Connection

#### Single chamber housing

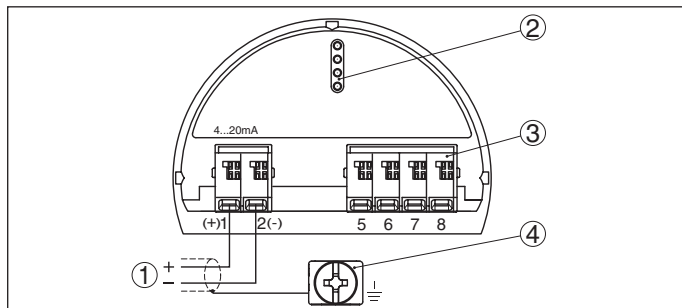


Fig. 20: Electronics and terminal compartment, single chamber housing

- 1 Voltage supply/Signal output
- 2 For display and adjustment module or interface adapter
- 3 For external display and adjustment unit
- 4 Ground terminal for connection of the cable screen

## 8 Electronics - 4 ... 20 mA - Two-wire VEGAWELL 52

### Voltage supply

Power supply and current signal are carried on the same two-wire cable. The operating voltage can differ depending on the instrument version.

You can find the data of the voltage supply in chapter "Technical data" in the operating instructions manual of the respective instrument.

Provide a reliable separation between the supply circuit and the mains circuits according to DIN EN 61140 VDE 0140-1.

Specifications of the voltage supply:

- Operating voltage
  - 8 ... 35 V DC
- Permissible residual ripple
  - < 100 Hz: < 1 V<sub>SS</sub>
  - 100 Hz ... 400 Hz: < 10 mV<sub>SS</sub>

Keep in mind the following additional factors that influence the operating voltage:

- Lower output voltage of the power supply unit under nominal load (e.g. with a sensor current of 20.5 mA or 22 mA in case of fault)
- Influence of additional instruments in the circuit (see load values in chapter "Technical data" of the operating instructions of the respective instrument)

### Connection cable

The instrument is connected with standard two-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326-1 for industrial areas, screened cable should be used.

### Cable screening and grounding

If screened cable is required, we recommend connecting the cable screen on both ends to ground potential. In the sensor, the screen must be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the ground potential (low impedance).

### Connection

#### Direct connection

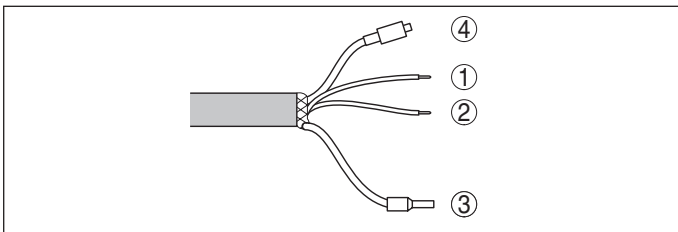


Fig. 21: Wire assignment, suspension cable

- 1 Blue (-): to power supply or to the processing system
- 2 Brown (+): to power supply or to the processing system
- 3 Shielding
- 4 Breather capillaries with filter element

### Connection via VEGABOX 03

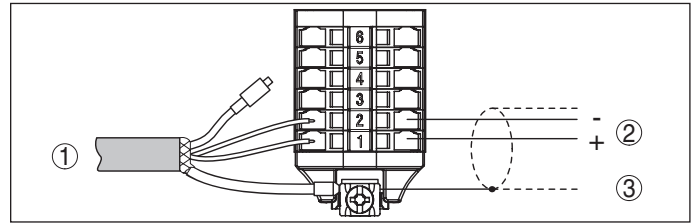


Fig. 22: Wiring plan VEGABAR for 4 ... 20 mA, 4 ... 20 mA/HART

- 1 To the sensor
- 2 To power supply or processing system
- 3 Shielding<sup>1)</sup>

Wire number	Wire colour/Polarity	Terminal
1	brown (+)	1
2	blue (-)	2
	Shielding	Grounding

<sup>1)</sup> Connect screen to ground terminal. Connect ground terminal on the outside of the housing to ground as prescribed. The two terminals are galvanically con-

nected.

## 9 Electronics - 4 ... 20 mA/HART - Two-wire VEGABAR 86 and 87

### Configuration of the electronics

The plug-in electronics is mounted in the electronics compartment of the instrument and can be exchanged by the user when servicing is required. The electronics is completely encapsulated to protect against vibration and moisture.

The terminals for voltage supply as well as the contact pins with I<sup>2</sup>C interface for parameter adjustment are located on the upper side of the electronics. In the double-chamber housing, the terminals are located in the separate terminal compartment.

### Voltage supply

Power supply and current signal are carried on the same two-wire cable. The operating voltage can differ depending on the instrument version.

You can find the data of the voltage supply in chapter "Technical data" in the operating instructions manual of the respective instrument.

Provide a reliable separation between the supply circuit and the mains circuits according to DIN EN 61140 VDE 0140-1.

Specifications of the voltage supply:

- Operating voltage
  - 9.6 ... 35 V DC
- Permissible residual ripple - Non-Ex, Ex-ia instrument
  - for U<sub>N</sub> 12 V DC: ≤ 0.7 V<sub>eff</sub> (16 ... 400 Hz)
  - for U<sub>N</sub> 24 V DC: ≤ 1.0 V<sub>eff</sub> (16 ... 400 Hz)
- Permissible residual ripple - Ex-d-ia instrument
  - for U<sub>N</sub> 24 V DC: ≤ 1.0 V<sub>eff</sub> (16 ... 400 Hz)

Keep in mind the following additional factors that influence the operating voltage:

- Lower output voltage of the power supply unit under nominal load (e.g. with a sensor current of 20.5 mA or 22 mA in case of fault)
- Influence of additional instruments in the circuit (see load values in chapter "Technical data" of the operating instructions of the respective instrument)

### Connection cable

The instrument is connected with standard two-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326-1 for industrial areas, screened cable should be used.

We generally recommend the use of screened cable for HART multidrop mode.

### Cable screening and grounding

If screened cable is required, we recommend connecting the cable screen on both ends to ground potential. In the sensor, the screen must be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the ground potential (low impedance).

### Connection

#### Single chamber housing

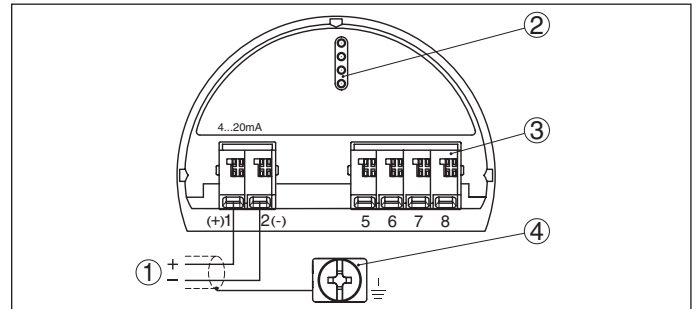


Fig. 23: Electronics and terminal compartment, single chamber housing

- 1 Voltage supply/Signal output
- 2 For display and adjustment module or interface adapter
- 3 For external display and adjustment unit
- 4 Ground terminal for connection of the cable screen

#### Double chamber housing

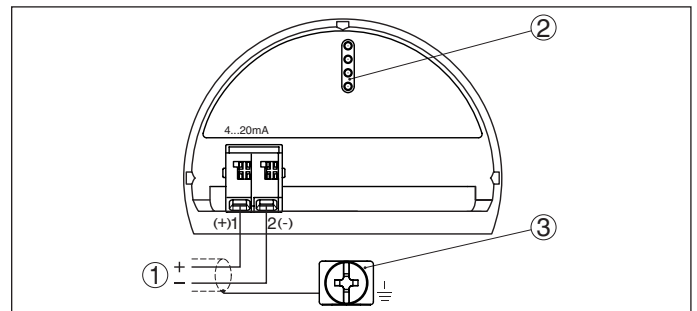


Fig. 24: Terminal compartment, double chamber housing

- 1 Voltage supply/Signal output
- 2 For display and adjustment module or interface adapter
- 3 Ground terminal for connection of the cable screen

## 10 Electronics - 4 ... 20 mA/HART Pt 100 - two-wire VEGAWELL 52

### Voltage supply

Power supply and current signal are carried on the same two-wire cable. The operating voltage can differ depending on the instrument version.

You can find the data of the voltage supply in chapter "Technical data" in the operating instructions manual of the respective instrument.

Provide a reliable separation between the supply circuit and the mains circuits according to DIN EN 61140 VDE 0140-1.

Specifications of the voltage supply:

- Operating voltage
  - 9.6 ... 35 V DC
- Permissible residual ripple
  - < 100 Hz: < 1 V<sub>SS</sub>
  - 100 Hz ... 400 Hz: < 10 mV<sub>SS</sub>

Keep in mind the following additional factors that influence the operating voltage:

- Lower output voltage of the power supply unit under nominal load (e.g. with a sensor current of 20.5 mA or 22 mA in case of fault)
- Influence of additional instruments in the circuit (see load values in chapter "Technical data" of the operating instructions of the respective instrument)

### Connection cable

The instrument is connected with standard two-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326-1 for industrial areas, screened cable should be used.

We generally recommend the use of screened cable for HART multidrop mode.

### Cable screening and grounding

If screened cable is required, we recommend connecting the cable screen on both ends to ground potential. In the sensor, the screen must be connected directly to the internal ground terminal. The ground terminal on the outside of the housing must be connected to the ground potential (low impedance).

### Connection

#### Direct connection

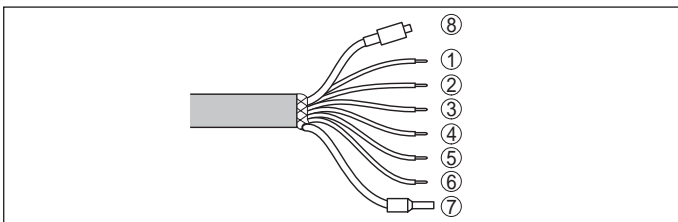


Fig. 25: Wire assignment, suspension cable

- 1 Brown (+): to power supply or to the processing system
- 2 Blue (-): to power supply or to the processing system
- 3 White: for processing of the integrated Pt 100 (power supply)
- 4 Yellow: for processing of the integrated Pt 100 (measurement)
- 5 Red: for processing of the integrated Pt 100 (measurement)
- 6 Black: for processing of the integrated Pt 100 (power supply)
- 7 Shielding
- 8 Breather capillaries with filter element

### Connection via VEGABOX 03

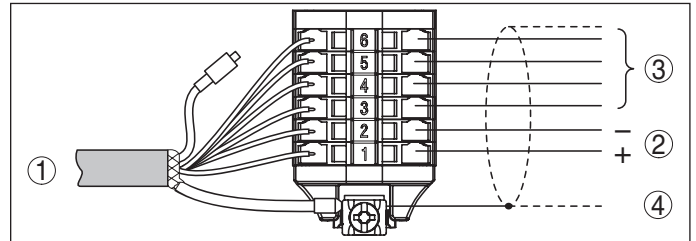


Fig. 26: Wiring plan VEGABAR for 4 ... 20 mA/HART Pt 100

- 1 To power supply or the processing system (signal pressure transmitter)
- 2 To power supply or the processing system (connection cables resistance thermometer Pt 100)
- 3 Shielding<sup>2)</sup>

Wire number	Wire colour/Polarity	Function
1	brown (+)	Power supply/signal pressure transmitter
2	blue (-)	Power supply/signal pressure transmitter
3	White	Power supply Pt 100
4	Yellow	Measurement Pt 100
5	Red	Measurement Pt 100
6	Black	Power supply Pt 100
	Shielding	Grounding

<sup>2)</sup> Connect screen to ground terminal. Connect ground terminal on the outside of the housing to ground as prescribed. The two terminals are galvanically con-

nected.

## 11 Electronics - Profibus PA VEGABAR 86 and 87

### Configuration of the electronics

The plug-in electronics is mounted in the electronics compartment of the instrument and can be exchanged by the user when servicing is required. The electronics is completely encapsulated to protect against vibration and moisture.

The terminals for voltage supply as well as the plug with I<sup>2</sup>C interface for parameter adjustment are located on the upper side of the electronics. In the double-chamber housing, these connection elements are located in the separate terminal compartment.

### Voltage supply

The voltage supply is provided by a Profibus DP /PA segment coupler.

Specifications of the voltage supply:

- Operating voltage
  - 9 ... 32 V DC
- Max. number of sensors per DP/PA segment coupler
  - 32

### Connection cable

Connection is carried out with screened cable according to Profibus specification.

Make sure that the entire installation is carried out according to the Profibus specification. In particular, make sure that the bus is terminated with suitable terminating resistors.

### Cable screening and grounding

In systems with potential equalisation, connect the cable screen directly to ground potential at the power supply unit, in the connection box and at the sensor. The screen in the sensor must be connected directly to the internal ground terminal. The ground terminal outside on the housing must be connected to the potential equalisation (low impedance).

In systems without potential equalisation, connect the cable screen directly to ground potential on the power supply unit and the sensor. In the connection box or T-distributor, the screen of the short stub to the sensor may not be connected to ground potential or to another cable screen.

### Connection

#### Single chamber housing

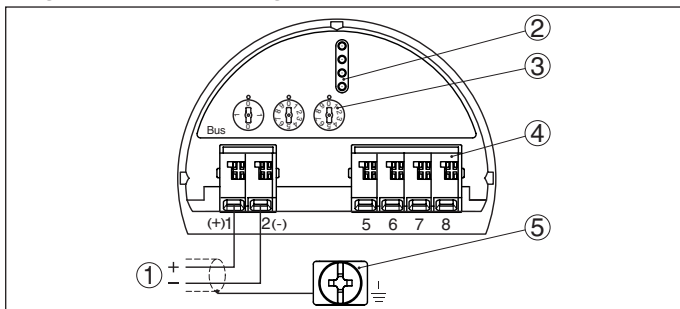


Fig. 27: Electronics and terminal compartment, single chamber housing

- 1 Voltage supply/Signal output
- 2 For display and adjustment module or interface adapter
- 3 Selection switch for bus address
- 4 For external display and adjustment unit
- 5 Ground terminal for connection of the cable screen

#### Connection, double chamber housing

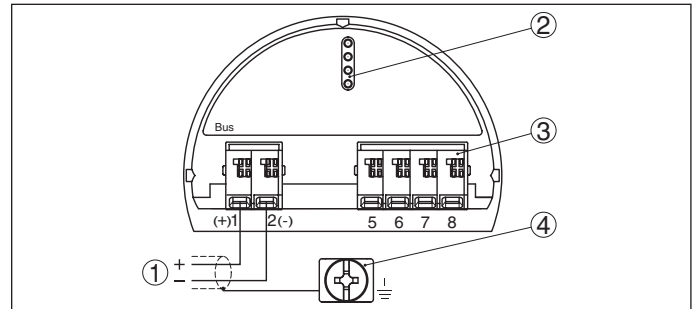


Fig. 28: Terminal compartment, double chamber housing

- 1 Voltage supply, signal output
- 2 For display and adjustment module or interface adapter
- 3 For external display and adjustment unit
- 4 Ground terminal for connection of the cable screen

## 12 Electronics - Foundation Fieldbus VEGABAR 86 and 87

### Configuration of the electronics

The plug-in electronics is mounted in the electronics compartment of the instrument and can be exchanged by the user when servicing is required. The electronics is completely encapsulated to protect against vibration and moisture.

The terminals for voltage supply as well as the plug with I<sup>2</sup>C interface for parameter adjustment are located on the upper side of the electronics. In the double-chamber housing, these connection elements are located in the separate terminal compartment.

### Voltage supply

Power supply via the H1 Fieldbus cable.

Specifications of the voltage supply:

- Operating voltage
  - 9 ... 32 V DC
- max. number of sensors
  - 32

### Connection cable

Connection is carried out with screened cable according to Fieldbus specification.

Make sure that the entire installation is carried out according to the Fieldbus specification. In particular, make sure that the bus is terminated with suitable terminating resistors.

### Cable screening and grounding

In systems with potential equalisation, connect the cable screen directly to ground potential at the power supply unit, in the connection box and at the sensor. The screen in the sensor must be connected directly to the internal ground terminal. The ground terminal outside on the housing must be connected to the potential equalisation (low impedance).

In systems without potential equalisation, connect the cable screen directly to ground potential on the power supply unit and the sensor. In the connection box or T-distributor, the screen of the short stub to the sensor may not be connected to ground potential or to another cable screen.

### Connection

#### Single chamber housing

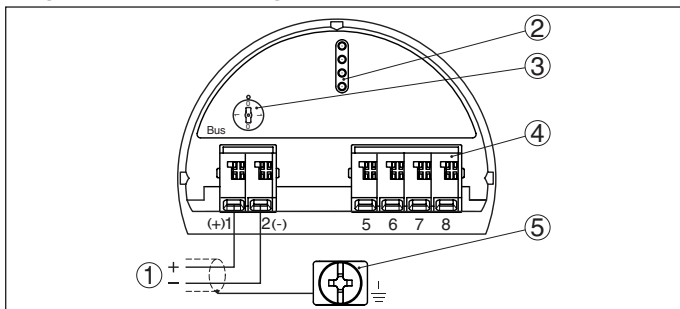


Fig. 29: Electronics and terminal compartment, single chamber housing

- 1 Voltage supply/Signal output
- 2 Contact pins for the display and adjustment module or interface adapter
- 3 Selection switch for bus address
- 4 For external display and adjustment unit
- 5 Ground terminal for connection of the cable screen

#### Connection, double chamber housing

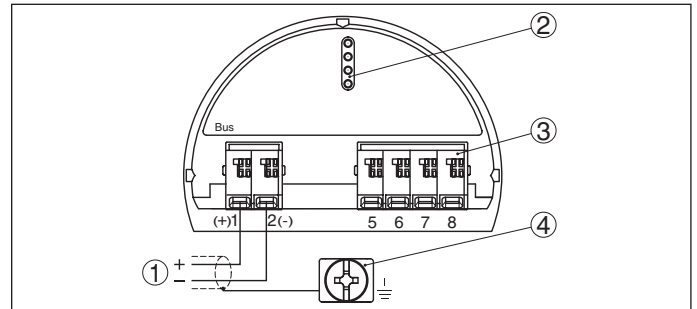


Fig. 30: Terminal compartment, double chamber housing

- 1 Voltage supply, signal output
- 2 For display and adjustment module or interface adapter
- 3 For external display and adjustment unit
- 4 Ground terminal for connection of the cable screen

### 13 Electronics - Modbus, Levelmaster protocol

#### Configuration of the electronics

The plug-in electronics is mounted in the electronics compartment of the instrument and can be exchanged by the user when servicing is required. The electronics is completely encapsulated to protect against vibration and moisture.

The contact pins with I<sup>2</sup>C interface for parameter adjustment are located on the upper side of the electronics. The terminals for the power supply are located in the separate connection compartment.

#### Voltage supply

Power supply via the Modbus host (RTU)

- Operating voltage
  - 8 ... 30 V DC
- max. number of sensors
  - 32

#### Connection cable

The instrument is connected with standard two-wire, twisted cable suitable for RS 485. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

For power supply, a separate two-wire cable is required.

Make sure that the entire installation is carried out according to the Fieldbus specification. In particular, make sure that the bus is terminated with suitable terminating resistors.

#### Cable screening and grounding

In systems with potential equalisation, connect the cable screen directly to ground potential at the power supply unit, in the connection box and at the sensor. The screen in the sensor must be connected directly to the internal ground terminal. The ground terminal outside on the housing must be connected to the potential equalisation (low impedance).

In systems without potential equalisation, connect the cable screen directly to ground potential on the power supply unit and the sensor. In the connection box or T-distributor, the screen of the short stub to the sensor may not be connected to ground potential or to another cable screen.

#### Connection

##### Double chamber housing

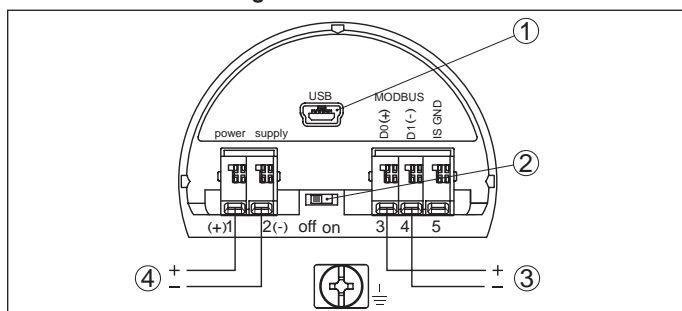


Fig. 31: Terminal compartment

- 1 USB interface
- 2 Slide switch for integrated termination resistor (120 Ω)
- 3 Modbus signal
- 4 Voltage supply



## 14 Adjustment

### 14.1 Adjustment directly at the measuring point

#### Via the display and adjustment module through keys

The plug-in display and adjustment module is used for measured value indication, adjustment and diagnosis. It is equipped with an illuminated full dot matrix as well as four keys for adjustment.



Fig. 32: Display and adjustment module with single chamber housing

#### Via the display and adjustment module through magnetic pen

With the Bluetooth version of the display and adjustment module, the sensor can also be adjusted with the magnetic pen. This is done right through the closed lid (with inspection window) of the sensor housing.



Fig. 33: Display and adjustment module - with adjustment via magnetic pen

#### Via a PC with PACTware/DTM

The interface converter VEGACONNECT is required for connection of the PC. The converter is placed on the sensor instead of the display and adjustment module and connected to the USB interface of the PC.



Fig. 34: Connection of the PC via VEGACONNECT and USB

- 1 VEGACONNECT
- 2 Sensor
- 3 USB cable to the PC
- 4 PC with PACTware/DTM

PACTware is an adjustment software for configuration, parameter adjustment, documentation and diagnosis of field devices. The corresponding device drivers are called DTMs.

### 14.2 Operation in the measurement loop environment - wireless via Bluetooth

#### Via a smartphone/tablet

The display and adjustment module with integrated Bluetooth functionality allows wireless connection to smartphones/tablets with iOS or Android operating system. The adjustment is carried out via the VEGA Tools app from the Apple App Store or Google Play Store.

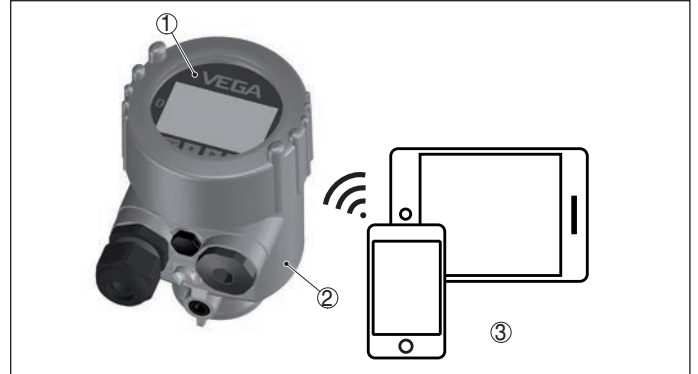


Fig. 35: Wireless connection to smartphones/tablets

- 1 Display and adjustment module
- 2 Sensor
- 3 Smartphone/Tablet

#### Via a PC with PACTware/DTM

The wireless connection from the PC to the sensor is carried out via the Bluetooth USB adapter and a display and adjustment module with integrated Bluetooth function. The adjustment is carried out via the PC with PACTware/DTM.



Fig. 36: Connection of the PC via Bluetooth USB adapter

- 1 Display and adjustment module
- 2 Sensor
- 3 Bluetooth USB adapter
- 4 PC with PACTware/DTM

### 14.3 Adjustment carried out at position remote from the measuring point - wired

#### Via external display and adjustment units

For this, the external display and adjustment units VEGADIS 81 and 82 are available. The adjustment is carried out via the keys of the built-in display and adjustment module.

The VEGADIS 81 is mounted at a distance of 50 m from the sensor and directly to the sensor electronics. VEGADIS 82 is looped directly into the signal cable at any point.



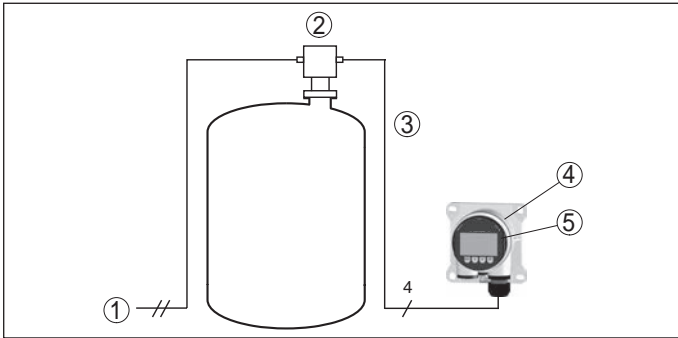


Fig. 37: Connection of VEGADIS 81 to the sensor

- 1 Voltage supply/Signal output sensor
- 2 Sensor
- 3 Connection cable sensor - external display and adjustment unit
- 4 External display and adjustment unit
- 5 Display and adjustment module

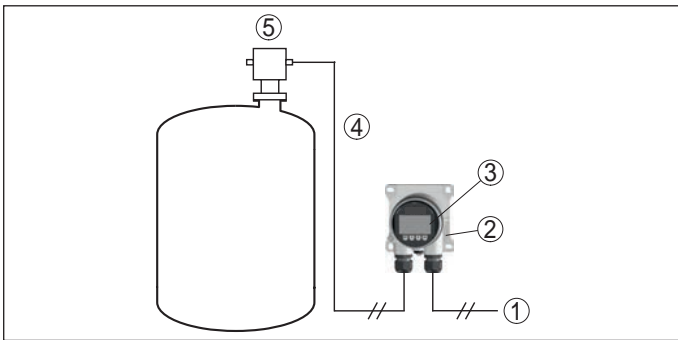


Fig. 38: Connection of VEGADIS 82 to the sensor

- 1 Voltage supply/Signal output sensor
- 2 External display and adjustment unit
- 3 Display and adjustment module
- 4 ... 20 mA/HART signal cable
- 5 Sensor

**Via a PC with PACTware/DTM**

The sensor adjustment is carried out via a PC with PACTware/DTM.

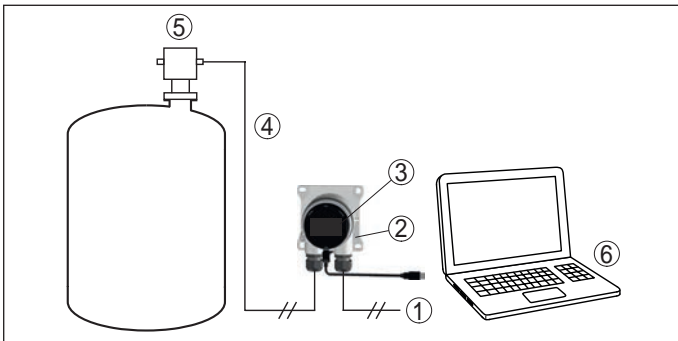


Fig. 39: Connection of VEGADIS 82 to the sensor, adjustment via PC with PACTware

- 1 Voltage supply/Signal output sensor
- 2 External display and adjustment unit
- 3 VEGACONNECT
- 4 ... 20 mA/HART signal cable
- 5 Sensor
- 6 PC with PACTware/DTM

**14.4 Adjustment carried out at position remote from the measuring point - wireless through mobile network**

As an option, the radio module PLICSMOBILE can be mounted into a plics® sensor with double chamber housing. It is used for transmission of measured values and for remote parameter adjustment of the sensor.

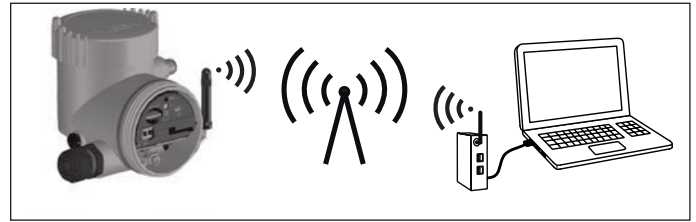


Fig. 40: Transmission of measured values and remote parameter adjustment of the sensor via mobile phone network.

**14.5 Alternative adjustment programs**

**DD adjustment programs**

Device descriptions as Enhanced Device Description (EDD) are available for DD adjustment programs such as, for example, AMS™ and PDM.

The files can be downloaded at [www.vega.com/downloads](http://www.vega.com/downloads) under "Software".

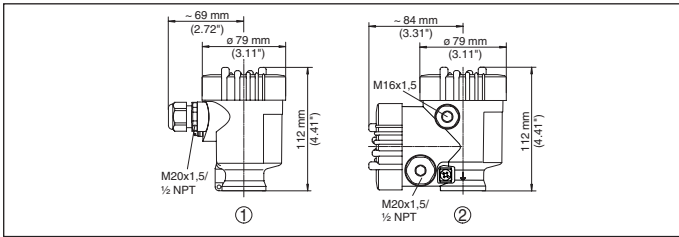
**Field Communicator 375, 475**

Device descriptions for the instruments are available as EDD for parameterisation with Field Communicator 375 or 475.

Integrating the EDD into the Field Communicator 375 or 475 requires the "Easy Upgrade Utility" software, which is available from the manufacturer. This software is updated via the Internet and new EDDs are automatically accepted into the device catalogue of this software after they are released by the manufacturer. They can then be transferred to a Field Communicator.

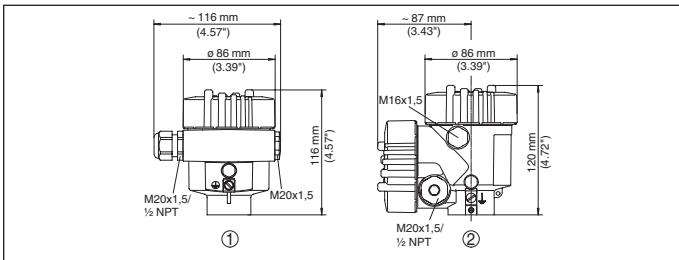
## 15 Dimensions

### Plastic housing



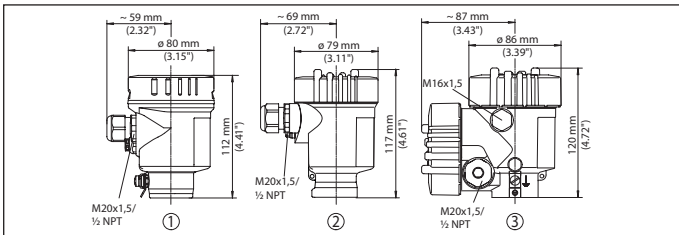
- 1 Single chamber housing
- 2 Double chamber housing

### Aluminium housing



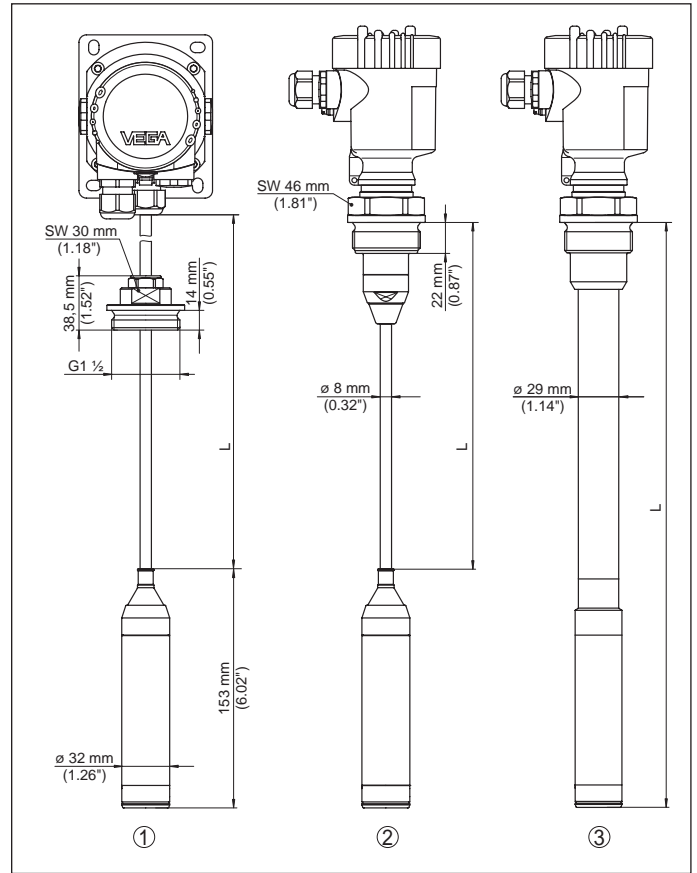
- 1 Single chamber housing
- 2 Double chamber housing

### Stainless steel housing



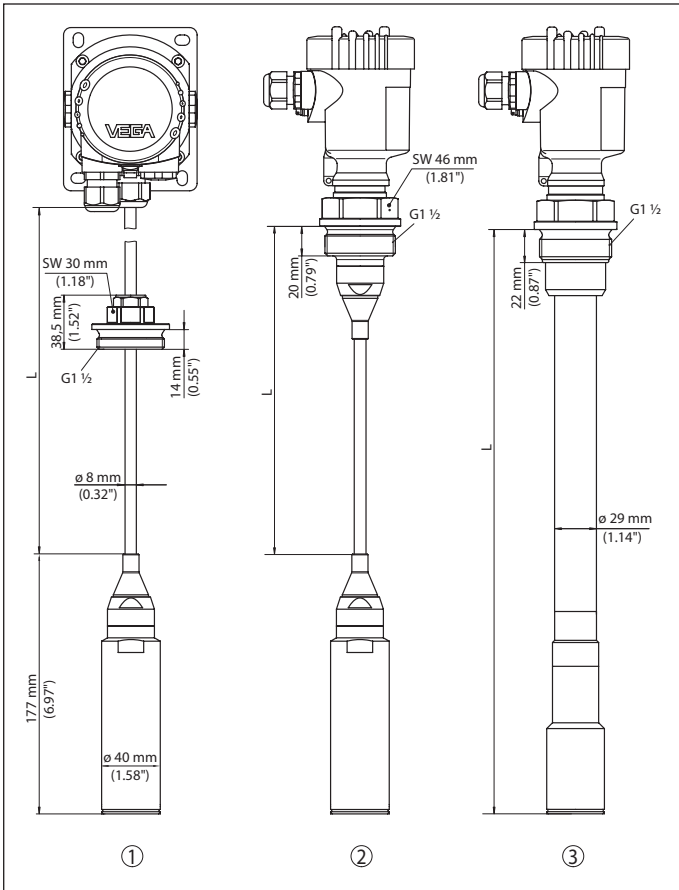
- 1 Single chamber housing, electropolished
- 2 Single chamber housing, precision casting
- 2 Double chamber housing, precision casting

### VEGABAR 86



- 1 Version with suspension cable and threaded fitting unassembled G1 1/2
- 2 Threaded version G1 1/2, suspension cable
- 3 Threaded version G1 1/2, connection tube

VEGABAR 87



- 1 Version with suspension cable and threaded fitting unassembled G1½
- 2 Threaded version G1½, suspension cable
- 3 Threaded version G1½, connection tube

VEGAWELL 52

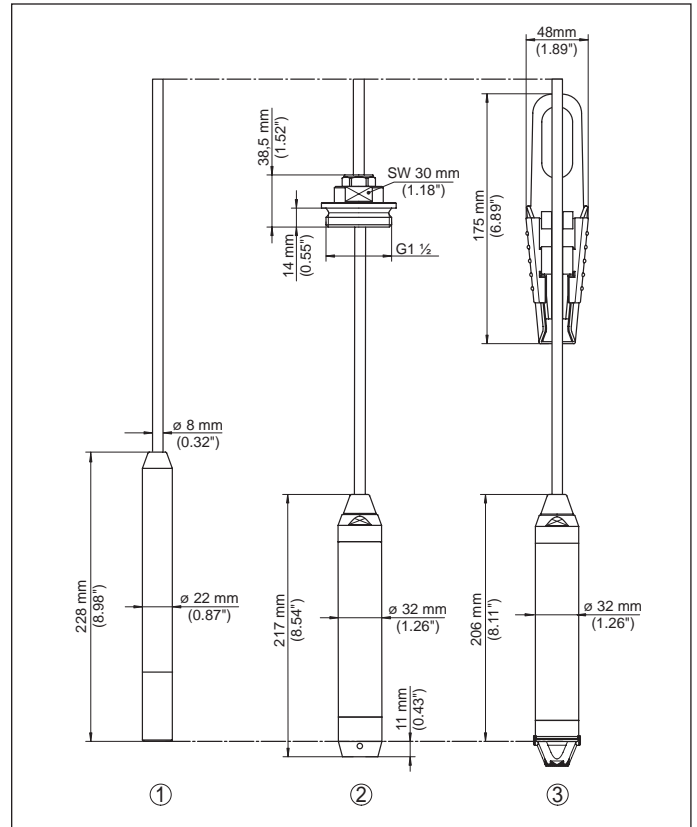


Fig. 46: Dimensions VEGABAR

- 1 Version with straining clamp
- 2 Version with unassembled screw connection G1½ and impact protection
- 3 Standard version with detachable plastic basket guard

The listed drawings represent only an excerpt of the available process fittings. You can find more drawings at [www.vega.com/downloads](http://www.vega.com/downloads) under "Drawings".





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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