

Level measurement in liquids

Ultrasonic

**VEGASON 61**  
**VEGASON 62**  
**VEGASON 63**



## Product Information



**VEGA**

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**Take note of safety instructions for Ex applications**



Please note the Ex specific safety information which you can find on our homepage [www.vega.com/services/downloads](http://www.vega.com/services/downloads) and which comes with every 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 Description of the measuring principle

## Measuring principle

Short ultrasonic pulses in the range of 35 kHz to 70 kHz are emitted by the transducer in the direction of the product, reflected by the product surface and received back by the transducer. The pulses travel at the speed of sound - the elapsed time from emission to reception of the signals depends on the level in the vessel.

The latest microcomputer technology and the proven ECHOFOX software select the level echo from among any number of false echoes and calculate the exact distance to the product surface. An integrated temperature sensor detects the temperature in the vessel and compensates the influence of temperature on the signal running time.

By simply entering the vessel dimensions, a level-proportional signal is generated from the distance. It is not necessary to fill the vessel for the adjustment.

## Wide application range

VEGASON 61, 62 and 63 ultrasonic sensors are especially suitable for level measurement of liquids, but are also good for solids. The instruments differ in their measuring range, transducer version and process fitting. Through different, adapted emitting frequencies, levels in a measuring range of 5 ... 15 m can be measured. Resistant materials for transducers and process fittings also allow applications in corrosive products (depending on the model). A practical mounting strap (optional) enables easy orientation of VEGASON 63.

## Independent of product properties

Fluctuations in product composition or even complete product changes do not influence the measuring result. A fresh adjustment is not necessary.

## Service and maintenance friendly

Thanks to the non-contact measuring principle, VEGASON 61, 62 and 63 sensors are especially easy to service and maintain.

## 1.1 Application examples

### Open basins

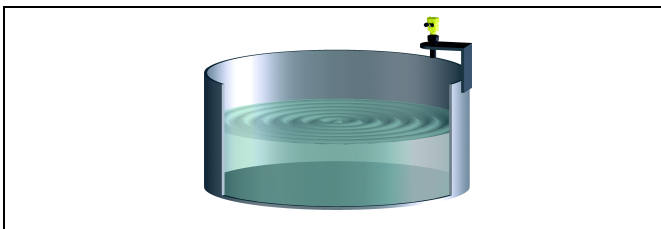


Fig. 1: Level measurement in an open basin with VEGASON 61

A typical application for VEGASON 61 sensors is level measurement of open basins. The measured media are rain water and sewage water and are thus charged with impurities. Here is where the advantages of non-contact measurement with VEGASON come into their own: simple and maintenance free. The degree

of pollution of the water or an accumulation of mud in the basin are not critical because VEGASON only measures the surface.

### Sludge container

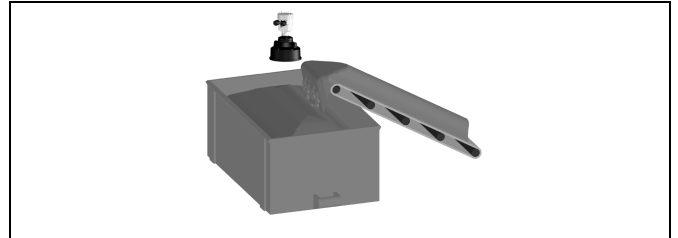


Fig. 2: Level measurement in a container with VEGASON 63

In sewage treatment plants, the accumulated sludge is dewatered and transported via conveyor belts to containers. The VEGASON 63 sensor measures the filling of the container. An empty container can thus be readied in good time before the max. level is reached. Thanks to the metal transducer diaphragm, measurement functionality is also ensured even under conditions of fluctuating temperatures and steam generation.



### Information:

Continuative documentation:

- 28775 - VEGASON 61
- 28776 - VEGASON 62
- 28777 - VEGASON 63
- 32774 - Safety Manual VEGASON series 60 - 4 ... 20 mA/HART

## 2 Type overview

**VEGASON 61**



**VEGASON 62**



**VEGASON 63**



|                      |  |  |  |
|----------------------|--|--|--|
| Applications:        | liquids and solids in virtually all industries, particularly in water and waste water management | liquids and solids in virtually all industries, particularly in water and waste water management | liquids and solids in virtually all industries   |
| Measuring range:     | Liquids: 0.25 ... 5 m (0.82 ... 16.4 ft)<br>Solids: 0.25 ... 2 m (0.82 ... 6.562 ft)             | Liquids: 0.4 ... 8 m (1.312 ... 26.25 ft)<br>Solids: 0.4 ... 3.5 m (1.312 ... 11.48 ft)          | Liquids: 0.6 ... 15 m (1.969 ... 49.21 ft)<br>Solids: 0.6 ... 7 m (1.969 ... 22.97 ft) |
| Process fitting:     | G1½ A of PVDF  | G2 A of PVDF   | compression flange or mounting strap   |
| Process temperature: | -40 ... +80 °C (-40 ... +176 °F)   | -40 ... +80 °C (-40 ... +176 °F)   | -40 ... +80 °C (-40 ... +176 °F)   |
| Process pressure:    | -0.2 ... 2 bar/-20 ... 200 kPa<br>(-2.9 ... 29 psig)   | -0.2 ... 2 bar/-20 ... 200 kPa<br>(-2.9 ... 29 psig)   | -0.2 ... 1 bar/-20 ... 100 kPa<br>(-2.9 ... 14.5 psig)                                 |

**Indicating and adjustment module**



PLICSCOM

**Housing**



Plastic



Stainless steel



Aluminium



Aluminium (double chamber)

**Electronics**



4 ... 20 mA/HART



4 ... 20 mA/HART four-wire



Profibus PA



Foundation Field-bus

**Sensors**



Transducer 1 1/2"



Transducer 2"

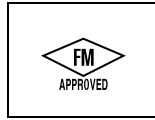


Transducer 4"

**Approvals**



Gas explosion protection



FM



Ship

### 3 Mounting instructions

#### Measuring range

The reference plane for the measurement is the lower edge of the transducer. All statements concerning the measuring range as well as the internal signal processing refer to this.

With all instruments, a minimum distance from the lower edge of the flange - the so-called dead band, in which measurement is not possible - must be maintained. The exact value of the dead band, depending on the instrument version, is stated in chapter "Technical data".

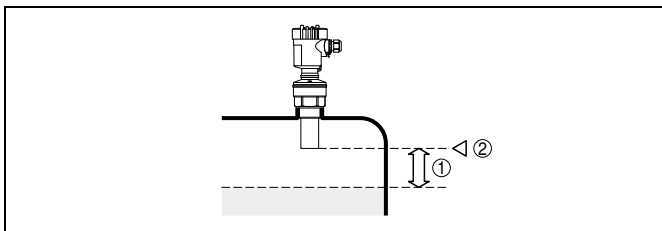


Fig. 3: Minimum distance to the max. level

- 1 Dead band
- 2 Reference plane for the measurement



#### Note:

If the medium reaches the transducer, buildup can form on it and cause faulty measurements later on.

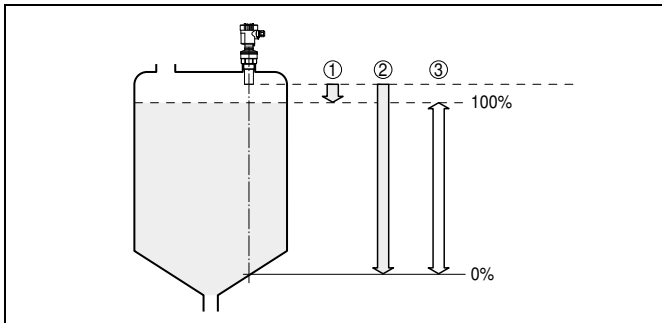


Fig. 4: Measuring range and max. measuring distance

- 1 full
- 2 empty (max. measuring distance)
- 3 Max. measuring range

#### Pressure/Vacuum

Gauge pressure in the vessel does not influence VEGASON. Low pressure or vacuum does, however, damp the ultrasonic pulses. This influences the measuring result, particularly if the level is very low. With pressures under -0.2 bar (-20 kPa) you should use a different measuring principle, e.g. radar or guided microwave.

#### Mounting position

When mounting VEGASON, keep a distance of at least 200 mm (7.874 in) to the vessel wall. If the sensor is installed in the center of dished or spherical vessel tops, multiple echoes can arise. These can, however, be faded out by an appropriate adjustment.

If you cannot keep this distance you should carry out a false echo storage before setup. This applies mainly if buildup on the vessel wall is expected. In this case, we recommend repeating a false echo storage later with existing buildup.

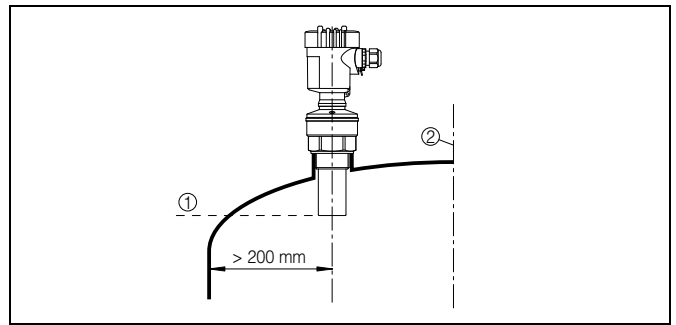


Fig. 5: Mounting on round vessel tops

- 1 Reference plane
- 2 Vessel center or symmetry axis

In vessels with conical bottom it can be advantageous to mount the sensor in the center of the vessel, as measurement is then possible down to the lowest point of the vessel bottom.

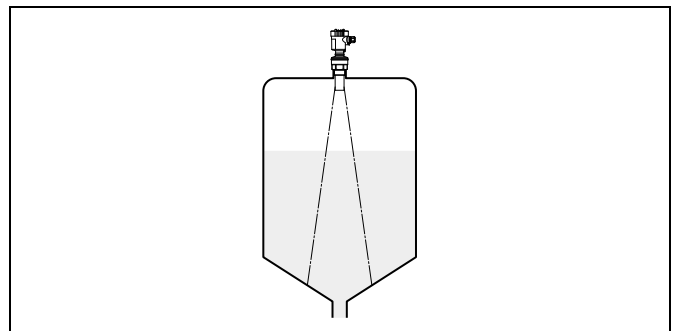


Fig. 6: Vessel with conical bottom

#### Socket

Socket pieces should be dimensioned so that the lower end of the transducer protrudes at least 10 mm (0.394 in) out of the socket.

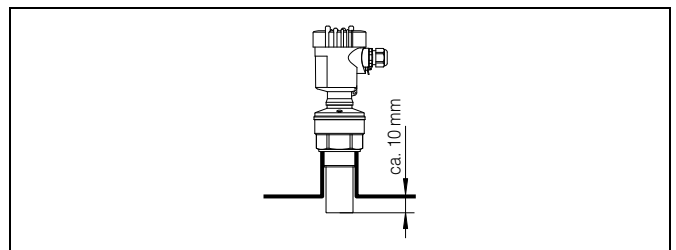


Fig. 7: Recommended socket mounting

If the reflective properties of the medium are good, you can mount VEGASON on sockets higher than the transducer length. You will find recommended values for socket heights in the operating in-

structions manual of the respective instrument. The socket end should be smooth and burr-free, if possible also rounded. A false echo storage is recommended.

**Sensor orientation**

With liquids, align the sensor as close to vertical as possible to achieve optimum measuring results.

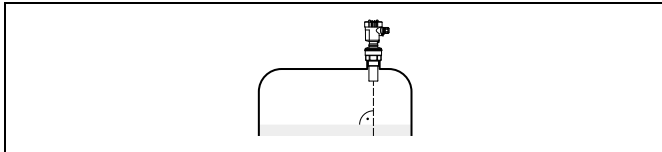


Fig. 8: Alignment in liquids

To reduce the min. distance to the medium, you can also mount VEGASON with a beam deflector of corrosion-resistant material. By doing this, it is possible to fill the vessel nearly to maximum. Such an arrangement is suitable primarily for open vessels such as e.g. overflow basins.

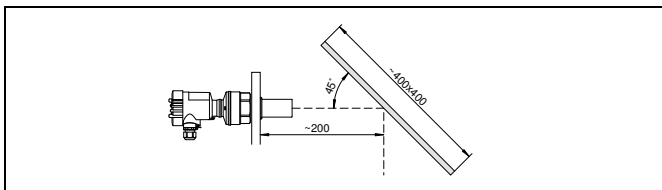


Fig. 9: Beam deflector

**Vessel installations**

The ultrasonic sensor should be installed at a location where no installations cross the ultrasonic beam.

If large vessel installations such as struts or supports cause false echoes, these can be attenuated through supplementary measures. Small, inclined sheet metal or plastic baffles above the installations scatter the ultrasonic signals and avoid direct false echoes.

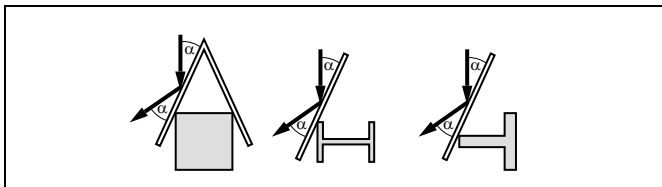


Fig. 10: Cover smooth profiles with deflectors

**Inflowing medium**

The instruments must not be mounted in or above the filling stream. Make sure that the product surface is detected, not the inflowing material.

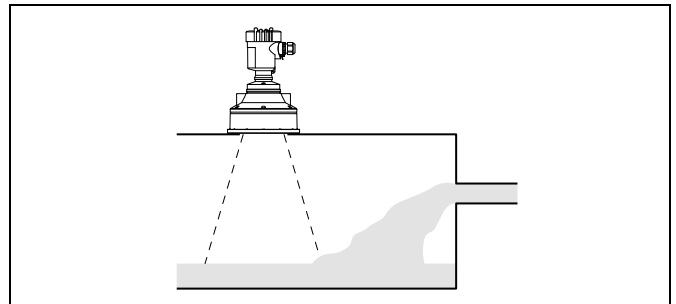


Fig. 11: Inflowing liquid

**Foam**

Through the action of filling, stirring and other processes in the vessel, dense foams which considerably damp the emitted signals may form on the product surface.

If foams cause measurement errors, the sensor should be used in a standpipe or, alternatively, the more suitable VEGAFLEX guided microwave sensors should be used.

Guided microwaves are unaffected by foam generation and are particularly suitable for such applications.

**Air turbulences**

If there are strong air currents in the vessel, e.g. due to strong winds over outdoor installations or air turbulence in the vessel, VEGASON should be mounted in a standpipe or you should use a different measuring principle, e.g. radar or guided radar (TDR).

**Standpipe measurement**

When used in a standpipe (surge pipe or bypass tube), the influence of installations, foam generation and turbulence is excluded. Details on standpipe measurement can be found in the operating instructions manual of the respective instrument.

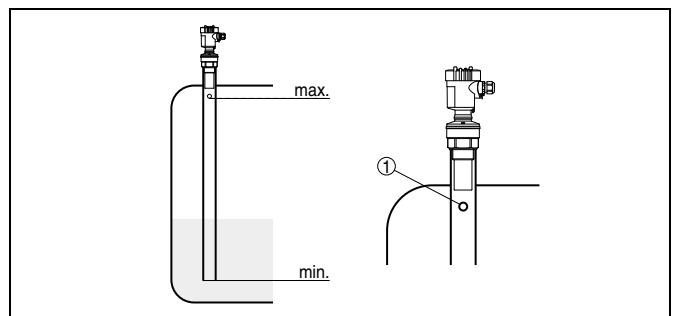


Fig. 12: Standpipe in tank

1 Vent hole:  $\varnothing$  5 ... 10 mm (0.197 ... 0.394 in)

Measurement in a standpipe is not recommended for very adhesive products.

## 4 Electrical connection

### 4.1 General requirements

The supply voltage range can differ depending on the instrument version. You can find exact specifications in chapter "Technical data".

The national installation standards as well as the valid safety regulations and accident prevention rules must be observed.



In hazardous areas you should take note of the appropriate regulations, conformity and type approval certificates of the sensors and power supply units.

### 4.2 Power supply

#### 4 ... 20 mA/HART two-wire

The VEGA power supply units VEGATRENN 149AEx, VEGAS-TAB 690, VEGADIS 371 as well as VEGAMET signal conditioning instruments are suitable for power supply. When one of these instruments is used, a reliable separation of the supply circuits from the mains circuits according to DIN VDE 0106 part 101 is ensured for the sensor.

#### 4 ... 20 mA/HART four-wire

Power supply and current output are carried on two separate connection cables.

The standard version can be operated with an earth-connected current output, the Exd version must be operated with a floating output.

The instrument is designed in protection class I. To maintain this protection class, it is absolutely necessary that the ground conductor be connected to the internal ground conductor terminal.

#### Profibus PA

Power is supplied by a Profibus DP/PA segment coupler or a VEGALOG 571 EP input card.

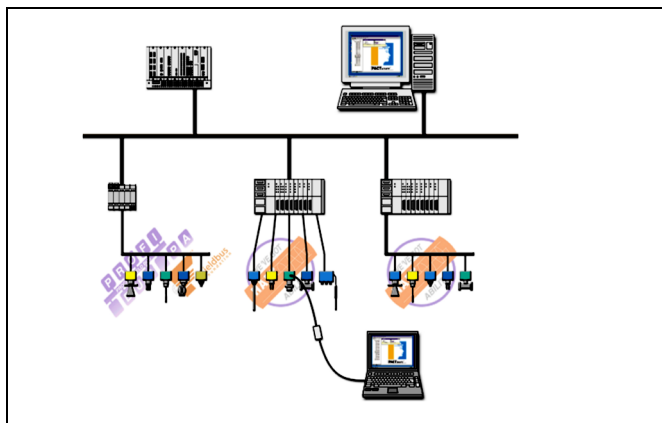


Fig. 13: Integration of instruments in a Profibus PA system via segment coupler DP/PA or data recording systems with Profibus PA input card

#### Foundation Fieldbus

Power supply via the H1 Fieldbus cable.

### 4.3 Connection cable and installation

#### General information

The sensors are connected with standard cable without screen. An outer cable diameter of 5 ... 9 mm ensures the seal effect of the cable entry.

VEGASON are optionally available with usual plug connectors (see "Technical data").

#### 4 ... 20 mA/HART two-wire and four-wire

If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used. In HART multidrop mode the use of screened cable is generally recommended.

#### Profibus PA, Foundation Fieldbus

The installation must be carried out according to the appropriate bus specification. VEGASON is connected appropriately with screened cable according to the bus specification. Power supply and digital bus signal are transmitted via the same two-wire connection cable. Make sure that the bus is terminated via appropriate terminating resistors.



In Ex applications, the corresponding installation regulations must be noted for the connection cable.

### 4.4 Cable screening and grounding

If screened cable is necessary, the cable screen must be connected on both ends to ground potential. If potential equalisation currents are expected, the connection on the evaluation side must be made via a ceramic capacitor (e.g. 1 nF, 1500 V).

#### Profibus PA, Foundation Fieldbus

In systems with potential separation, the cable screen is connected directly to ground potential on the power supply unit, in the connection box and directly on the sensor.

In systems without potential equalisation, connect the cable screen directly to ground potential only at the power supply unit and at the sensor - do not connect to ground potential in the connection box or T-distributor.



### 4.5 Wiring plan

#### Single chamber housing

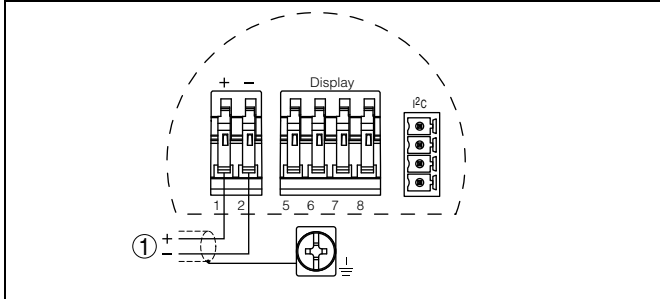


Fig. 14: Connection HART two-wire, Profibus PA, Foundation Fieldbus

1 Voltage supply and signal output

#### Wire assignment, connection cable with version IP 66/IP 68, 1 bar

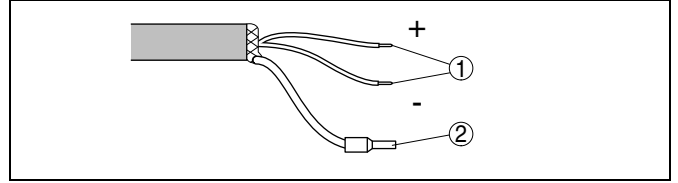


Fig. 17: Wire assignment, connection cable

- 1 brown (+) and blue (-) to power supply or to the processing system
- 2 Shielding

#### Double chamber housing - two-wire

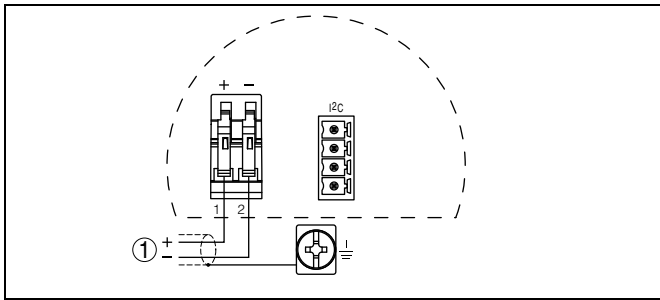


Fig. 15: Connection HART two-wire, Profibus PA, Foundation Fieldbus

1 Voltage supply and signal output

#### Double chamber housing - 4 ... 20 mA/HART four-wire

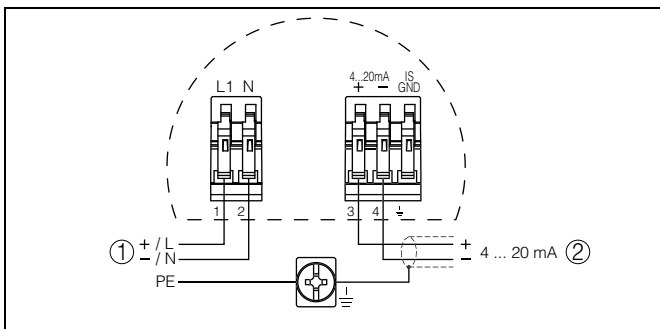


Fig. 16: Connection 4 ... 20 mA/HART four-wire

- 1 Power supply
- 2 Signal output

## 5 Operation

### 5.1 Overview

The sensors can be adjusted with the following adjustment media:

- with indicating and adjustment module
- an adjustment software according to FDT/DTM standard, e.g. PACTware and PC

and, depending on the signal output, also with:

- A HART handheld (4 ... 20 mA/HART)
- The adjustment program AMS (4 ... 20 mA/HART and Foundation Fieldbus)
- The adjustment program PDM (Profibus PA)
- A configuration tool (Foundation Fieldbus)

The entered parameters are generally saved in the sensor, optionally also in the indicating and adjustment module or in the adjustment program.

### 5.2 Compatibility according to NAMUR NE 53

VEGASON meet NAMUR recommendation NE 53. VEGA instruments are generally upward and downward compatible:

- Sensor software for DTM VEGASON HART, PA or FF
- DTM VEGASON for adjustment software PACTware
- Indicating and adjustment module PLICSCOM for sensor software

The parameter adjustment of the basic sensor functions is independent of the software version. The range of available functions depends on the respective software version of the individual components.

### 5.3 Adjustment with the indicating and adjustment module PLICSCOM

#### Setup and indication

PLICSCOM is a pluggable indication and adjustment module for plics<sup>®</sup> sensors. It can be placed in four different positions on the instrument (each displaced by 90°). Indication and adjustment are carried out via four keys and a clear, graphic-capable dot matrix display. The adjustment menu with language selection is clearly structured and enables easy setup. After setup, PLICSCOM serves as indicating instrument: through the screwed cover with glass insert, measured values can be read directly in the requested unit and presentation style.

The integrated background lighting of the display can be switched on via the adjustment menu.<sup>1)</sup>

<sup>1)</sup> For instruments with national approvals such as e.g. according to FM or CSA, only available at a later date.

### PLICSCOM adjustment

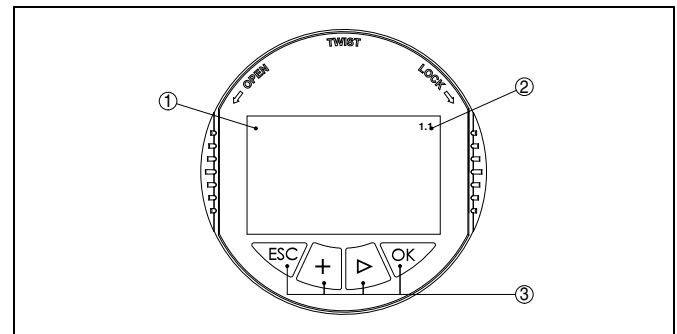


Fig. 18: Indicating and adjustment elements

- 1 LC display
- 2 Indication of the menu item number
- 3 Adjustment keys

### Key functions

- **[OK]** key:
  - Move to the menu overview
  - Confirm selected menu
  - Edit parameter
  - Save value
- **[→]** key to select:
  - menu change
  - list entry
  - Select editing position
- **[+]** key:
  - Change value of the parameter
- **[ESC]** key:
  - interrupt input
  - jump to the next higher menu

### 5.4 Adjustment with PACTware

#### PACTware/DTM

Independent of the respective signal output 4 ... 20 mA/HART, Profibus PA or Foundation Fieldbus, the sensors can be adjusted with PACTware directly on site. The sensors with signal output 4 ... 20 mA/HART can be also operated via the HART signal on the signal cable.

A VEGACONNECT interface adapter as well as an instrument driver for the respective sensor is necessary for adjustment with PACTware. All currently available VEGA DTMs are included as a DTM Collection with the current PACTware version on a CD. They can be purchased for a token fee from the responsible VEGA agency. In addition, this DTM Collection incl. the basic version of PACTware can be downloaded free of charge from the Internet.

To use the entire range of functions of a DTM, including project documentation, a DTM licence is required for that particular in-

strument family. This licence can be bought from the VEGA agency serving you.

instrument descriptions are already implemented in the current version of AMS™. For older versions of AMS™, a free-of-charge download is available via Internet.

### Connection of the PC via VEGACONNECT

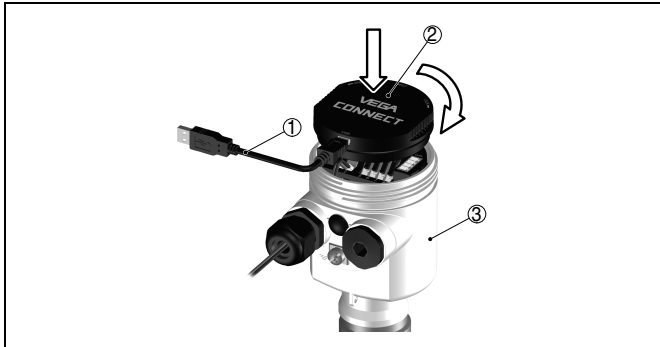


Fig. 19: Connection of the PC via VEGACONNECT directly to the sensor

- 1 USB cable to the PC
- 2 VEGACONNECT
- 3 Sensor

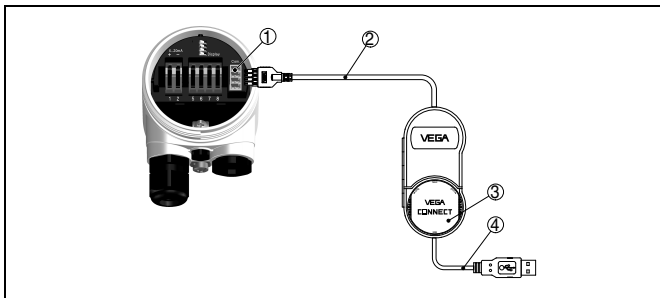


Fig. 20: Connection via I<sup>2</sup>C connection cable

- 1 I<sup>2</sup>C bus (com.) interface on the sensor
- 2 I<sup>2</sup>C connection cable of VEGACONNECT
- 3 VEGACONNECT
- 4 USB cable to the PC

Necessary components:

- VEGASON
- PC with PACTware and suitable VEGA DTM
- VEGACONNECT
- Power supply unit or processing system

## 5.5 Adjustment with other adjustment programs

### PDM

For VEGA Profibus PA sensors, instrument descriptions for the adjustment program PDM are available as EDD. The instrument descriptions are already implemented in the current version of PDM. For older versions of PDM, a free-of-charge download is available via Internet.

### AMS

For VEGA Foundation Fieldbus sensors, instrument descriptions for the adjustment program AMS™ are available as DD. The

## 6 Technical data

### General data

#### VEGASON 61, 62

Materials, wetted parts

|                                   |                   |
|-----------------------------------|-------------------|
| – Process fitting                 | PVDF              |
| – Transducer                      | PVDF              |
| – Seal transducer/process fitting | EPDM, FKM (Viton) |

#### VEGASON 63

Materials, wetted parts

|                                   |        |
|-----------------------------------|--------|
| – Mounting strap                  | 1.4301 |
| – Process fitting                 | UP     |
| – Transducer diaphragm            | 316Ti  |
| – Seal transducer/process fitting | EPDM   |

Materials, non-wetted parts

|   |   |
|---|---|
| – compression flange (VEGASON 63)                 | PPH, 316L   |
| – Housing   | Plastic PBT (polyester), Alu die-casting powder-coated, 316L  |
| – Seal between housing and housing cover          | NBR (stainless steel housing), silicone (Alu/plastic housing) |
| – Inspection window in housing cover for PLICSCOM | Polycarbonate   |
| – Ground terminal                                 | 316Ti/316L  |

Weight

|                  |   |
|------------------|---|
| – VEGASON 61, 62 | 1.8 ... 4 kg (4 ... 8.8 lbs), depending on the process fitting and housing    |
| – VEGASON 63     | 2.7 ... 5.7 kg (6 ... 12.6 lbs), depending on the process fitting and housing |

### Output variable

#### 4 ... 20 mA/HART

|   |  |
|---|--|
| Output signal                           | 4 ... 20 mA/HART   |
| Signal resolution                       | 1.6 $\mu$ A  |
| Fault message                           | Current output unchanged 20.5 mA, 22 mA, < 3.6 mA (adjustable) |
| Max. output current                     | 22 mA  |
| Load                                    |  |
| – 4 ... 20 mA/HART two-wire instrument  | see load diagram under Power supply                            |
| – 4 ... 20 mA/HART four-wire instrument | max. 500 $\Omega$ <sup>2)</sup>                                |
| Damping (63 % of the input variable)    | 0 ... 999 s, adjustable  |
| Fulfilled NAMUR recommendations         | NE 43  |

#### Profibus PA

|                                      |   |
|--------------------------------------|---|
| Output signal                        | digital output signal, format according to IEEE-754 |
| Sensor address                       | 126 (default setting)                               |
| Current value                        | 10 mA, $\pm$ 0.5 mA                                 |
| Damping (63 % of the input variable) | 0 ... 999 s, adjustable                             |

#### Foundation Fieldbus

|                                      |   |
|--------------------------------------|---|
| Output                               |   |
| – Signal                             | digital output signal, Foundation Fieldbus protocol |
| – Physical layer                     | according to IEC 61158-2                            |
| Channel Numbers                      |   |
| – Channel 1                          | Primary Value                                       |
| – Channel 2                          | Secondary Value 1                                   |
| – Channel 3                          | Secondary Value 2                                   |
| Transmission rate                    | 31.25 Kbit/s  |
| Current value                        | 10 mA, $\pm$ 0.5 mA                                 |
| Damping (63 % of the input variable) | 0 ... 999 s, adjustable                             |

### Input variable

|                 |   |
|-----------------|---|
| Measured value  | distance between lower edge of the transducer and product surface |
| Measuring range |   |
| – VEGASON 61    | up to 5 m (16.4 ft) liquid/up to 2 m (6.562 ft) solid             |
| – VEGASON 62    | up to 8 m (26.25 ft) liquid/up to 3.5 m (11.48 ft) solid          |
| – VEGASON 63    | up to 15 m (49.21 ft) liquid/up to 7 m (22.97 ft) solid           |

<sup>2)</sup> With inductive load ohmic share min. 25  $\Omega$ /mH.

Dead band

|              |                  |
|--------------|------------------|
| - VEGASON 61 | 0.25 m (0.82 ft) |
| - VEGASON 62 | 0.4 m (1.312 ft) |
| - VEGASON 63 | 0.6 m (1.969 ft) |

**Measuring characteristics**

|  |   |
|--|---|
| Ultrasonic frequency                           |   |
| - VEGASON 61                                   | 70 kHz  |
| - VEGASON 62                                   | 55 kHz  |
| - VEGASON 63                                   | 35 kHz  |
| Interval                                       | > 2 s (dependent on the parameter adjustment) |
| Beam angle at 3 dB                             |   |
| - VEGASON 61, 62                               | 11°   |
| - VEGASON 63                                   | 6°  |
| Step response or adjustment time <sup>3)</sup> | > 3 s (dependent on the parameter adjustment) |

**Measuring accuracy**

|                         |                   |
|-------------------------|-------------------|
| Resolution, general     | < 1 mm (0.039 in) |
| Deviation <sup>4)</sup> | see diagram       |

**VEGASON 61**

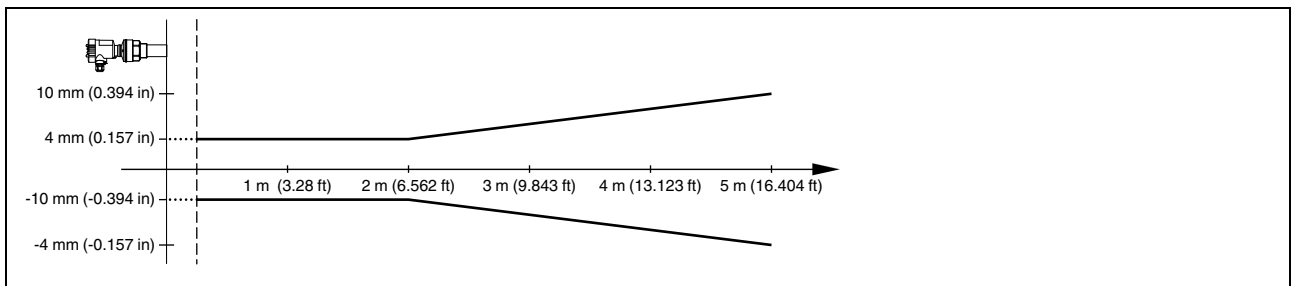


Fig. 21: Deviation VEGASON 61

**VEGASON 62**

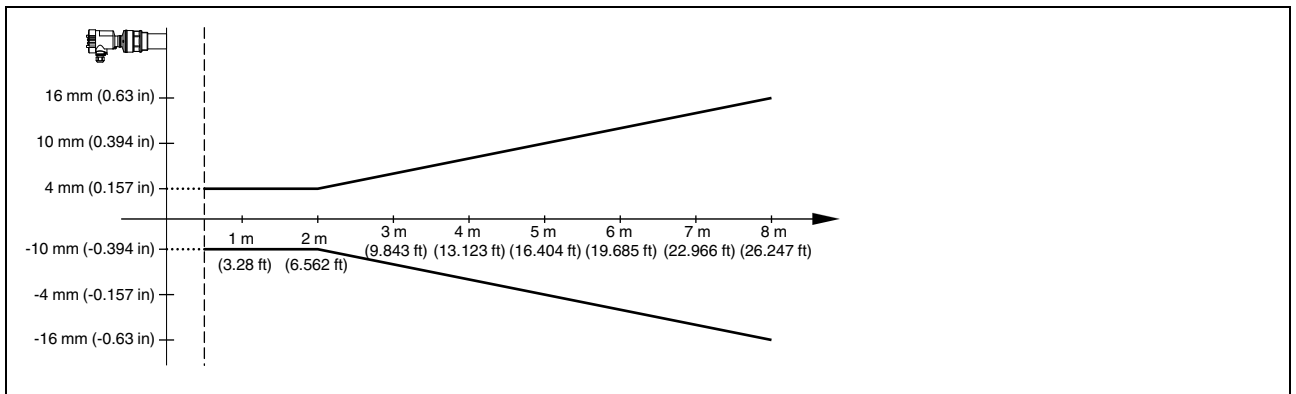


Fig. 22: Deviation VEGASON 62

<sup>3)</sup> Time to output the correct level (with max. 10 % deviation) after a sudden level change.  
<sup>4)</sup> Incl. non-linearity, hysteresis and non-repeatability.

**VEGASON 63**

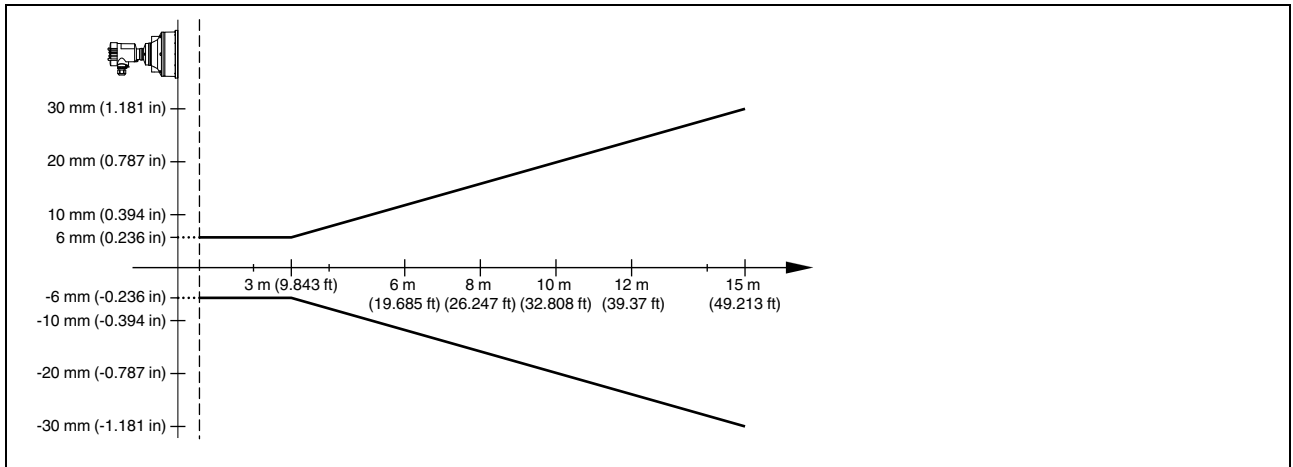


Fig. 23: Deviation VEGASON 63

**Ambient conditions**

|   |                                  |
|---|----------------------------------|
| Ambient, storage and transport temperature            |                                  |
| – without PLICSCOM                                    | -40 ... +80 °C (-40 ... +176 °F) |
| – with PLICSCOM                                       | -20 ... +70 °C (-4 ... +158 °F)  |
| – Four-wire instrument                                | -40 ... +70 °C (-40 ... +158 °F) |
| – Version IP 66/IP 68, 1 bar with connection cable PE | -20 ... +60 °C (-4 ... +140 °F)  |

**Process conditions**

|  |   |
|--|---|
| Vessel pressure                              |   |
| – VEGASON 61, 62                             | -0.2 ... 2 bar/-20 ... 200 kPa                                |
| – VEGASON 63 with compression flange         | -0.2 ... 1 bar/-20 ... 100 kPa                                |
| – VEGASON 63 with mounting strap             | 0 kPa (0 bar), since no sealing possibility                   |
| Process temperature (transducer temperature) | -40 ... +80 °C (-40 ... +176 °F)                              |
| Vibration resistance                         | mechanical vibrations with 4 g and 5 ... 100 Hz <sup>5)</sup> |

**Electromechanical data - version IP 66/IP 67 and IP 66/IP 68; 0.2 bar**

|                                |   |
|--------------------------------|---|
| Cable entry/plug <sup>6)</sup> |   |
| – Single chamber housing       | <ul style="list-style-type: none"> <li>• 1 x cable gland M20 x 1.5 (cable: ø 5 ... 9 mm), 1 x blind stopper M20 x 1.5</li> <li>or:</li> <li>• 1 x closing cap M20 x 1.5; 1 x blind stopper M20 x 1.5</li> <li>or:</li> <li>• 1 x closing cap ½ NPT, 1 x blind plug ½ NPT</li> <li>or:</li> <li>• 1 x plug (depending on the version), 1 x blind stopper M20 x 1.5</li> </ul>  |
| – Double chamber housing       | <ul style="list-style-type: none"> <li>• 1 x cable entry M20 x 1.5 (cable: ø 5 ... 9 mm), 1 x blind stopper M20 x 1.5; 1 x blind stopper M16 x 1.5 or optionally available with 1 x plug M12 x 1 for VEGADIS 61</li> <li>or:</li> <li>• 1 x closing cap ½ NPT, 1 x blind stopper ½ NPT, 1 x blind stopper M16 x 1.5 or optionally 1 x plug M12 x 1 for VEGADIS 61</li> <li>or:</li> <li>• 1 x plug (depending on the version), 1 x blind stopper M20 x 1.5; 1 x blind stopper M16 x 1.5 or optionally available with 1 x plug M12 x 1 for VEGADIS 61</li> </ul> |
| Connection terminals           | Spring-loaded terminals for wire cross-section up to 2.5 mm <sup>2</sup> (AWG 14)   |

<sup>5)</sup> Tested according to the regulations of German Lloyd, GL directive 2.

<sup>6)</sup> Depending on the version M12 x 1, according to DIN 43650, Harting, 7/8" FF.

**Electromechanical data - version IP 66/IP 68, 1 bar**

|                          |   |
|--------------------------|---|
| Cable entry              |   |
| – Single chamber housing | <ul style="list-style-type: none"> <li>• 1 x IP 68 cable gland M20 x 1.5; 1 x blind stopper M20 x 1.5</li> </ul> or: <ul style="list-style-type: none"> <li>• 1 x closing cap ½ NPT, 1 x blind plug ½ NPT</li> </ul>  |
| – Double chamber housing | <ul style="list-style-type: none"> <li>• 1 x IP 68 cable gland M20 x 1.5; 1 x blind stopper M20 x 1.5; plug M12 x 1 for VEGADIS 61 (optional)</li> </ul> or: <ul style="list-style-type: none"> <li>• 1 x closing cap ½ NPT, 1 x blind stopper ½ NPT, plug M12 x 1 for VEGADIS 61 (optional)</li> </ul> |
| Connection cable         |   |
| – Wire cross-section     | 0.5 mm <sup>2</sup>   |
| – Wire resistance        | < 0.036 Ω/m   |
| – Tensile strength       | > 1200 N (270 pounds force)   |
| – Standard length        | 5 m (16.4 ft)   |
| – Max. length            | 1000 m (3280 ft)  |
| – Min. bending radius    | 25 mm (0.984 in) with 25 °C (77 °F)   |
| – Diameter approx.       | 8 mm (0.315 in)   |
| – Colour - standard PE   | Black   |
| – Colour - standard PUR  | Blue  |
| – Colour - Ex-version    | Blue  |

**Indicating and adjustment module**

|   |                          |
|---|--------------------------|
| Voltage supply and data transmission    | through the sensor       |
| Indication                              | LC display in dot matrix |
| Adjustment elements                     | 4 keys                   |
| Protection                              |                          |
| – unassembled                           | IP 20                    |
| – mounted into the sensor without cover | IP 40                    |
| Materials                               |                          |
| – Housing                               | ABS                      |
| – Inspection window                     | Polyester foil           |

**Supply voltage - 4 ... 20 mA/HART**

**Standard version**

|   |                         |
|---|-------------------------|
| Operating voltage   |                         |
| – Non-Ex instrument   | 14 ... 36 V DC          |
| – EEx-ia instrument   | 14 ... 30 V DC          |
| – EEx-d-ia instrument   | 20 ... 36 V DC          |
| Operating voltage with lighted indicating and adjustment module <sup>7)</sup> |                         |
| – Non-Ex instrument   | 20 ... 36 V DC          |
| – EEx-ia instrument   | 20 ... 30 V DC          |
| – EEx-d-ia instrument   | 20 ... 36 V DC          |
| Permissible residual ripple   |                         |
| – < 100 Hz  | U <sub>ss</sub> < 1 V   |
| – 100 Hz ... 10 kHz   | U <sub>ss</sub> < 10 mV |
| Load  | see diagram             |

<sup>7)</sup> For instruments with national approvals such as e.g. according to CSA, only available at a later date.

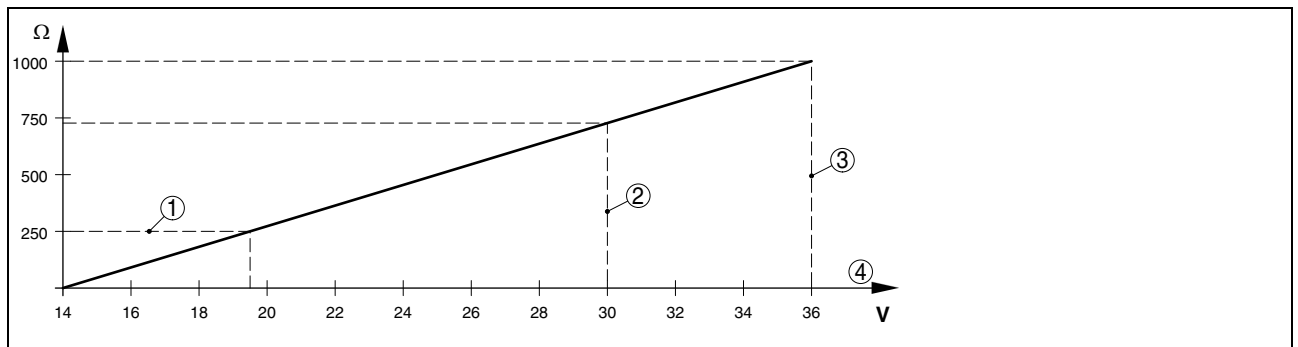


Fig. 24: Voltage diagram

- 1 HART load
- 2 Voltage limit EEx-ia instrument
- 3 Voltage limit non-Ex instrument
- 4 Operating voltage

**Voltage supply - 4 ... 20 mA/HART four wire instrument**

|                              |   |
|------------------------------|---|
| Operating voltage            |   |
| - Non-Ex and Ex-d instrument | 20 ... 72 V DC, 20 ... 253 V AC, 50/60 Hz (with and without lighting of the indicating and adjustment module) |
| Power consumption            | max. 4 VA, max. 2.1 W   |

**Voltage supply - Profibus PA**

|   |                           |
|---|---------------------------|
| Operating voltage   |                           |
| - Non-Ex instrument   | 9 ... 32 V DC             |
| - EEx-ia instrument   | 9 ... 24 V DC             |
| Operating voltage with lighted indicating and adjustment module |                           |
| - Non-Ex instrument   | 12 ... 36 V DC            |
| - EEx-ia instrument   | 12 ... 30 V DC            |
| Power supply by/max. number of sensors                          |                           |
| - DP/PA segment coupler   | max. 32 (max. 10 with Ex) |
| - VEGALOG 571 EP card   | max. 15 (max. 10 with Ex) |

**Power supply - Foundation Fieldbus**

|   |                           |
|---|---------------------------|
| Operating voltage   |                           |
| - Non-Ex instrument   | 9 ... 32 V DC             |
| - EEx-ia instrument   | 9 ... 24 V DC             |
| Operating voltage with lighted indicating and adjustment module |                           |
| - Non-Ex instrument   | 12 ... 32 V DC            |
| - EEx-ia instrument   | 12 ... 24 V DC            |
| Power supply by/max. number of sensors                          |                           |
| - H1 power supply   | max. 32 (max. 10 with Ex) |

**Electrical protective measures**

|  |                                     |
|--|-------------------------------------|
| Protection   |                                     |
| - Plastic housing  | IP 66/IP 67                         |
| - Double chamber Alu-housing, four-wire instruments              | IP 66/IP 67                         |
| - Alu and stainless steel housing, two-wire instruments          | IP 66/IP 68 (0.2 bar) <sup>8)</sup> |
| - Alu and stainless steel housing optional, two-wire instruments | IP 66/IP 68 (1 bar)                 |
| Overvoltage category   | III                                 |
| Protection class   |                                     |
| - two-wire, Profibus PA, Foundation Fieldbus                     | II                                  |
| - four-wire  | I                                   |

<sup>8)</sup> A suitable cable is the prerequisite for maintaining the protection class.



**Existing approvals or approvals applied for**

|                                   |                                      |
|-----------------------------------|--------------------------------------|
| Gas and dust explosion protection | e.g. according to ATEX, FM, CSA, IEC |
| Ship approval                     | e.g. according to GL, LRS, ABS, RINA |
| Functional safety                 | SIL 2 IEC 61508                      |

The available approvals can be selected via the configurator on [www.vega.com](http://www.vega.com).

Depending on the version, instruments with approvals can have different technical data. For these instruments, please note the corresponding approval documents. They can be downloaded in the download section on [www.vega.com](http://www.vega.com).

**CE conformity**

|                   |  |
|-------------------|--|
| 2004/108/EG (EMC) | EN 61326-1: 2006 Emission: Class A, Immission: Industrial Area |
| 2006/95/EG (LVD)  | EN 61010-1: 2001   |

**Environmental instructions**

|  |   |
|--|---|
| VEGA environment management system   | certified according to DIN EN ISO 14001 |
| You can find detailed information under <a href="http://www.vega.com">www.vega.com</a> . |   |

## 7 Dimensions

### Housing in protection IP 66/IP 67 and IP 66/IP 68; 0.2 bar

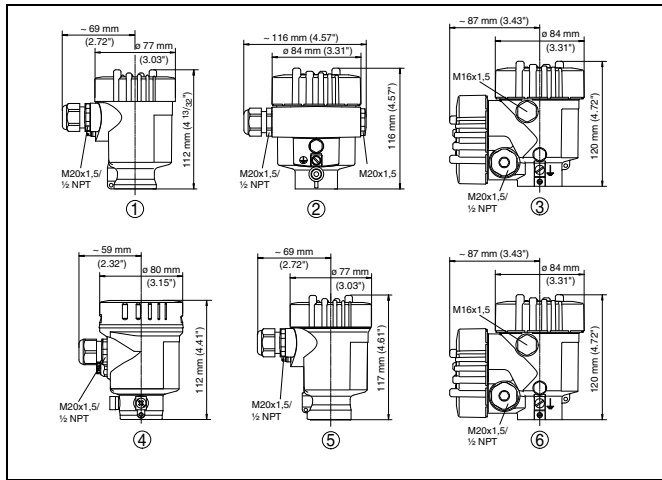


Fig. 25: Housing versions in protection IP 66/IP 67 and IP 66/IP 68, 0.2 bar; with integrated indicating and adjustment module the housing is 9 mm (1/64") higher

- 1 Plastic housing
- 2 Stainless steel housing
- 3 Aluminium double chamber housing
- 4 Aluminium housing

### Housing in protection IP 66/IP 68, 1 bar

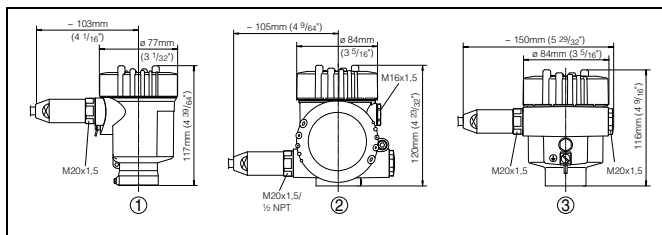


Fig. 26: Housing versions in protection IP 66/IP 68, 1 bar with integrated indicating and adjustment module the housing is 9 mm (1/64") higher

- 1 Stainless steel housing
- 2 Aluminium double chamber housing
- 3 Aluminium housing

### VEGASON 61

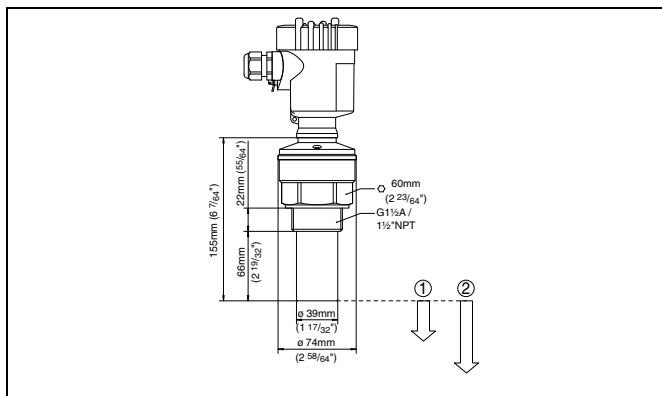


Fig. 27: VEGASON 61

- 1 Dead zone: 0.25 m (0.82 ft)
- 2 Measuring range: with liquids up to 5 m (16.4 ft), with solids up to 2 m (6.562 ft)

### VEGASON 62

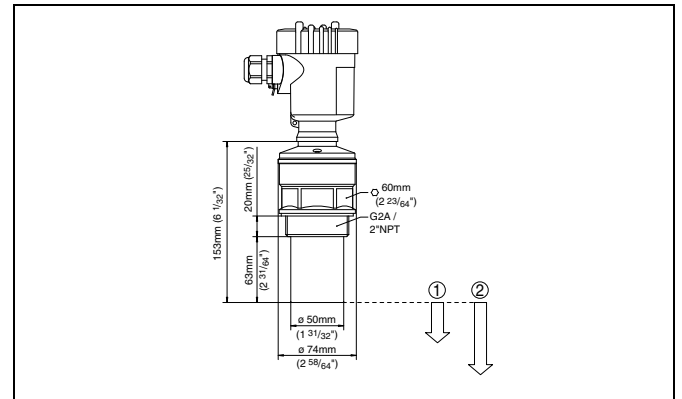


Fig. 28: VEGASON 62

- 1 Dead zone: 0.4 m (1.312 ft)
- 2 Measuring range: with liquids up to 8 m (26.25 ft), with solids up to 3.5 m (11.48 ft)

### VEGASON 63

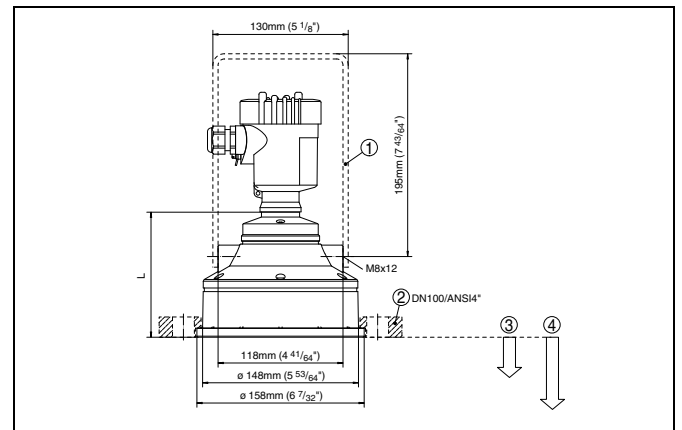


Fig. 29: VEGASON, dimension L with Alu housing = 108 mm (4.252"), dimension L with plastic and stainless steel housing = 114.5 mm (4.508")

- 1 Mounting strap
- 2 Compression flange
- 3 Dead zone: 0.6 m (1.969 ft)
- 4 Measuring range: with liquids up to 15 m (49.21 ft), with solids up to 7 m (22.97 ft)





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