Operating Instructions

VEGASON 65

Foundation Fieldbus

Ultrasonic

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Supplementary operating instructions manuals

Information:
VEGASON 65 is available in many versions and is therefore supplied according to customer order. Depending on the selected version, supplementary operating instructions manuals also come with the delivery. You will find the supplementary operating instructions manuals in chapter "*Product description*".

Operating instructions manuals for accessories and replacement parts

Tip:
To ensure reliable setup and operation of your VEGASON 65, we offer accessories and replacement parts. The associated documents are:

- Operating instructions manual 27720 "*External indicating and adjustment unit VEGADIS 61*"
- Operating instructions manual 30206 "*Oscillator VEGASON series 60*"
- Operating instructions manual 30205 "*Transmitting electronics VEGASON 64, 65, 66*"

1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup. In addition, you will find important notes on maintenance and trouble shooting. Please read this information before putting the instrument into operation.

Keep this manual as a product component safe and accessible in the immediate proximity of the device.

1.2 Target group

This operating instructions manual is directed to trained, qualified personnel. The contents of this manual should be made available to these personnel and put into practice by them.

1.3 Symbolism used

Information, tip, note
This symbol indicates helpful additional information.

Caution: If this warning is ignored, faults or malfunctions can result.
Warning: If this warning is ignored, injury to persons and/or serious damage to the instrument can result.
Danger: If this warning is ignored, serious injury to persons and/or destruction of the instrument can result.

Ex applications
This symbol indicates special instructions for Ex applications.

- **List**
  The dot set in front indicates a list with no implied sequence.

→ **Action**
This arrow indicates a single action.

1 **Sequence**
Numbers set in front indicate successive steps in a procedure.

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2 For your safety

2.1 Authorised personnel

All operations described in this operating instructions manual must be carried out only by trained specialist personnel authorised by the operator.

During work on and with the device the required personal protection equipment must always be worn.

2.2 Appropriate use

VEGASON 65 is a sensor for continuous level measurement.

You can find detailed information on the application range of VEGASON 65 in chapter "*Product description*".

2.3 Warning about misuse

Inappropriate or incorrect use of the instrument can give rise to application-specific hazards, e.g. vessel overfill or damage to system components through incorrect mounting or adjustment.

2.4 General safety instructions

This is a are high-tech instrument requiring the strict observance of standard regulations and guidelines. The user must take note of the safety instructions in this operating instructions manual, the country-specific installation standards (e.g. the VDE regulations in Germany) as well as all prevailing safety regulations and accident prevention rules.

The instrument must only be opereated in technically correct and reliable condition. The operator is responsible for the interference-free operation of the instrument.

The user is further compelled to determine the compliance of the necessary occupational safety measures with the current version of the valid regulations and note new regulations during complete duration of use.

2.5 CE conformity

VEGASON 65 is in CE conformity with EMC (89/336/EWG) and LVD (73/23/EWG).

Conformity has been judged according to the following standards:

- EMC:
  - Emission EN 61326: 1997 (class A)
  - Susceptibility EN 61326: 1997/A1:1998
- LVD: EN 61010-1: 2001

VEGASON 65 is designed for use in an industrial environment. Nevertheless, electromagnetic interference from electrical conductors and radiated emissions must be taken into account, as is usual with a class A instrument according to EN 61326. If VEGASON 65 is used in a different environment, the electromagnetic compatibility to other instruments must be ensured by suitable measures.

2.6 Fulfilling NAMUR recommendations

VEGASON 65 and its indicating and adjustment components fulfill NAMUR recommendation NE 53 in respect to compatibility. VEGA instruments are generally upward and downward compatible:

- Sensor software to DTM VEGASON 65 HART, PA or FF
- DTM VEGASON 65 for adjustment software PACTware™
- Indicating and adjustment module 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.

The software version of VEGASON 65 can be determined as follows:

- via PACTware™
- on the type label of the electronics
- via the indicating and adjustment module

You can view all software histories on our website www.vega.com. Make use of this advantage and get registered for update information via e-mail.

2.7 Safety instructions for Ex areas

Please note the Ex-specific safety information for installation and operation in Ex areas. These safety instructions are part of the operating instructions manual and come with the Ex-approved instruments.

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2.8 Environmental instructions

Protection of the environment is one of our most important duties. That is why we have introduced an environment management system with the goal of continuously improving company environmental protection. The environment management system is certified according to DIN EN ISO 14001.

Please help us fulfil this obligation by observing the environmental instructions in this manual:

- Chapter "*Packaging, transport and storage*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGASON 65 ultrasonic sensor
- unassembled cable gland
- Documentation
  - this operating instructions manual
  - Ex specific safety instructions (with Ex versions), if necessary further certificates
  - Operating instructions manual "*Indicating and adjustment module PLICSCOM*" (optional)

Components

VEGASON 65 consists of the following components:

- transducer with process fitting (depending on version flange, swivelling holder or thread)
- housing with electronics (depending on version remote)
- Housing cover, optionally available with indicating and adjustment module PLICSCOM

The components are available in different versions.

Version A compact in flange version

Version B compact with swivelling holder

Version C separately with swivelling holder

Version D separately with thread

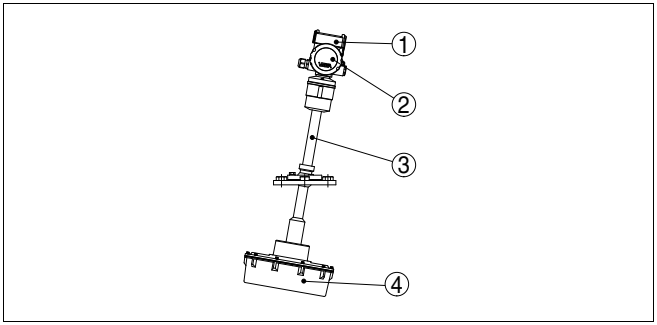

Fig. 1: VEGASON 65 compact with swivelling holder
1 Housing cover with integrated PLICSCOM (optional)
2 Housing with electronics
3 Swivelling holder with flange
4 Transducer

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3.2 Principle of operation

Area of application

VEGASON 65 is an ultrasonic sensor for continuous level measurement. It is particularly suitable for solids, but also good for liquids.

Functional principle

The transducer of the ultrasonic sensor transmits short ultrasonic pulses to the measured product. These pulses are reflected by product surface and received again by the rtansducer as echoes. The running time of the ultrasonic pulases from emission to reception is proportional to the distance and hence the level. The determined level is converted into an appropriate output signal and outputted as measured value.

Power supply and bus communication

Four-wire electronics with separate power supply.

Power for the signal output is supplied via the H1 Fieldbus. A two-wire cable according to Fieldbus specification serves as carrier of both power and digital data transmission for multiple sensors. This cable can be operated in two versions:

- via an H1 interface card in the control system and additional power supply
- via a Linking device with HSE (High speed Ethernet) and additional power supply according to IEC 61158-2

DD/CFF

The DD (Device Descriptions) and CFF (capability files) necessary for planning and configuration of your FF (Foundation Fieldbus) communication network are available in the download area of the VEGA homepage www.vega.com under "*Services - Downloads - Software - Foundation Fieldbus*". The appropriate certificates are also available there. A CD with the appropriate files and certificates can be ordered via e-mail under info@de.vega.com or by phone from one of the VEGA agencies under the order number "DRIVER.S".

3.3 Operation

VEGASON 65 can be adjusted with different adjustment media:

- with indicating and adjustment module
- with the suitable VEGA DTM in conjunction with an adjustment software according to the FDT/DTM standard, e.g. PACTware™ and PC
- a configuration tool

The entered parameters are generally saved in VEGASON 65, optionally also in the indicating and adjustment module or in PACTware™.

3.4 Packaging, transport and storage

Packaging

Your instrument was protected by packaging during transport. Its capacity to handle normal loads during transport is assured by a test according to DIN EN 24180.

The packaging of standard instruments consists of environment-friendly, recyclable cardboard. For special versions, PE foam or PE foil is also used. Dispose of the packaging material via specialised recycling companies.

Transport

Transport must be carried out under consideration of the notes on the transport packaging. Nonobservance of these instructions can cause damage to the device.

Transport inspection

The delivery must be checked for completeness and possible transit damage immediately at receipt. Ascertained transit damage or concealed defects must be appropriately dealt with.

Storage

Up to the time of installation the packaging must be closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packaging must be stored only under the following conditions:

- Not in the open
- Dry and dust free
- Not exposed to corrosive media
- Protected against solar radiation
- Avoiding mechanical shock and vibration

Storage and transport temperature

- Storage and transport temperature see "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 … 85 %

4 Mounting

4.1 General instructions

Wetted materials

Make sure that the wetted parts of VEGASON 65, especially the seal and process fitting, are suitable for the existing process conditions such as pressure, temperature etc. as well as the chemical properties of the medium.

You can find the specifications in chapter "*Technical data*" in the "*Supplement*".

Installation position

Select an installation position you can easily reach for mounting and connecting as well as later retrofitting of an indicating and adjustment module. The housing can be rotated by 330° without the use of any tools. You can also install the indicating and adjustment module in four different positions (each displaced by 90°).

Moisture

Use the recommended cables (see chapter "*Connecting to power supply*") and tighten the cable gland.

You can give your VEGASON 65 additional protection against moisture penetration by leading the connection cable downward in front of the cable entry. Rain and condensation water can thus drain off. This applies mainly to mounting outdoors, in areas where moisture is expected (e.g. by cleaning processes) or on cooled or heated vessels.

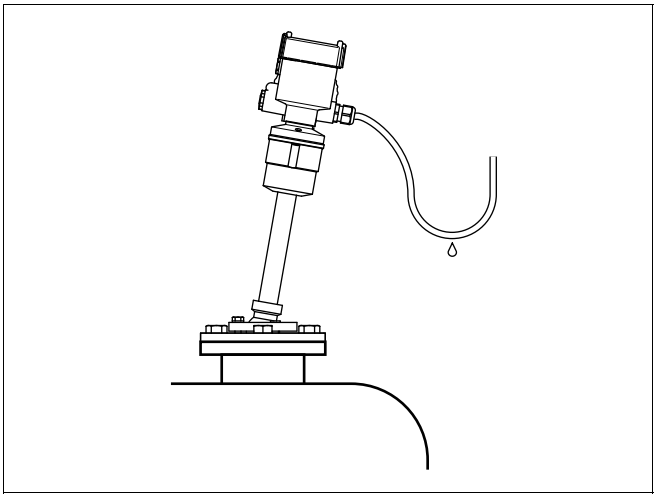

Fig. 2: Measures against moisture penetration

Measuring range

The reference plane for the measuring range (version A) is the lower edge of the flange. The reference plane for versions B, C and D is the lower edge of the transducer.

Make sure that for all versions a min. distance - the so called dead zone - below the reference plane is maintained in which a measurement is not possible. The exact value of the dead zone is stated in the "*Technical data*" in the "*Supplement*".

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

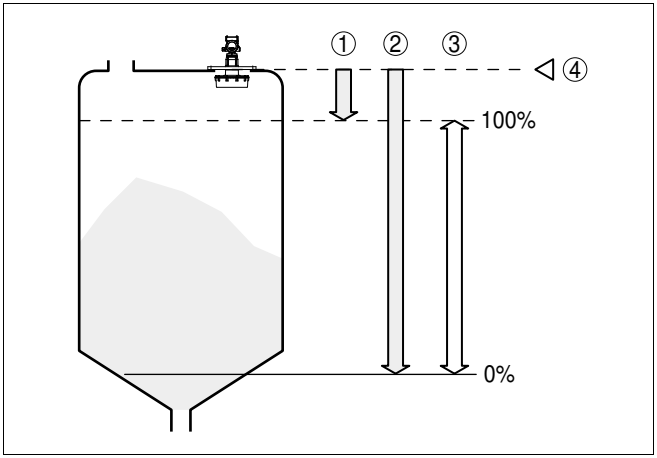

Fig. 3: Version A - Measuring range (operating range) and max. measuring distance
1 full (dead zone)
2 empty (max. measuring distance)
3 Measuring range
4 Reference plane

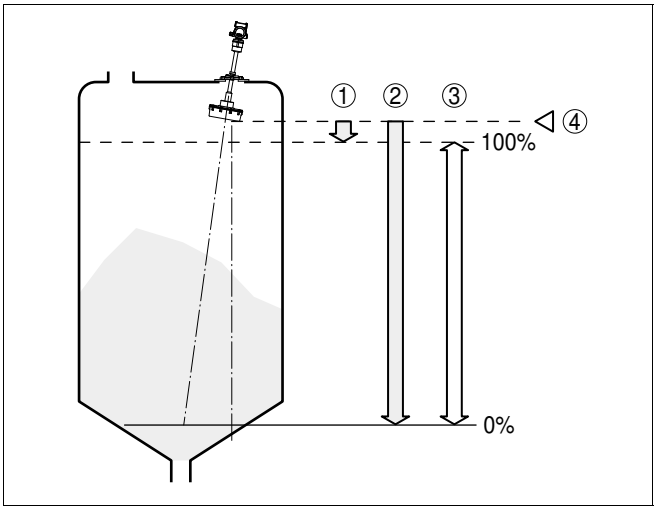

Fig. 4: Version B, C, D - Measuring range (operating range) and max. measuring distance
1 full (dead zone)
2 empty (max. measuring distance)
3 Measuring range
4 Reference plane

Pressure/Vacuum

Gauge pressure in the vessel does not influence VEGASON 65. 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.

4.2 Mounting preparations

Warning:
Mounting preparations must be carried out in **idle condition**. Non-observance can cause damages on the electronics!

Mounting - Version B

Version B is supplied in two parts:

- Transducer
- Electronics housing

Assemble the version as follows:

1 Loosen the screws on the fixing ring (4) with a hexagon spanner (size 4), remove the transducer tube out of the swivelling holder

2 Mount the flange

3 Insert the transducer tube in the requested length from below into the swivelling holder

4 Fasten with screws (4); torque max. 10 Nm

5 Remove the plug from below out of the instrument housing and plug it into the socket of the transducer tube

6 Plug the electronics housing to the transducer tube. Do not squeeze any cables. The housing is in the correct position, if the lower notch (2) of the transducer tube is no longer visible

7 Tighten the screws (5) on the housing moderately with a hexagon spanner (size 4)

8 Loosen terminal screw of the swivelling holder (3) with a fork spanner (SW 13)

9 Direct the sensor with the swivelling holder to the measured product

10 Fasten the swivelling holder with screw (3), torque max. 20 Nm

11 Secure screw (3) with lacquer or similar to ensure permanent tightness of the swivelling holder

12 Rotate the housing in such a way that the cable entry points downwards (moisture can drain off). Fasten the housing with screws (5); torque Aluminium housing max. 5 Nm, torque plastic housing max. 2 Nm

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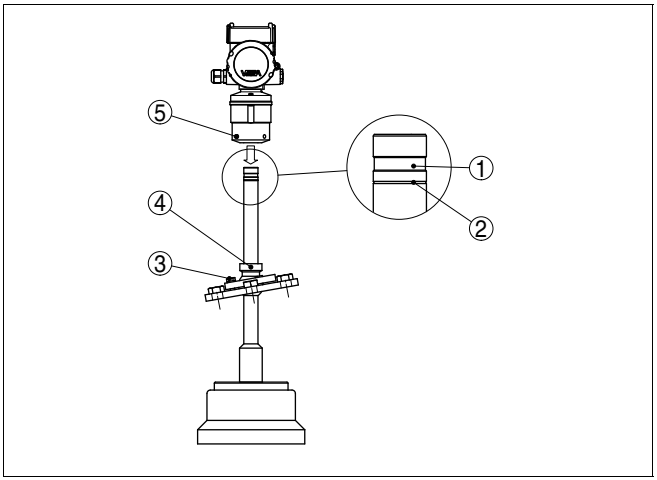

Fig. 5: Mounting - Version B
1 Groove to lock the housing
2 Notch
3 Screw of swivelling holder (hexagon SW 13)
4 Grub screw, fixing ring (hexagon spanner - size 4)
5 Terminal screws, housing (hexagon spanner - size 4)

Mounting - Version C

Version C is supplied in three parts:

- Transducer
- Transducer cable
- electronics for wall mounting

Assemble the version as follows:

1 Loosen the screws on the fixing ring (4) with a hexagon spanner (size 4), remove the transducer tube out of the swivelling holder

2 Mount the flange

3 Insert the transducer tube in the requested length from below into the swivelling holder

4 Fasten with screws (4); torque max. 10 Nm

5 Remove the plug from below out of the connection head and plug it into the socket of the transducer tube

6 Plug the connection head to the transducer tube. Do not squeeze any cables. The cylinder is in the correct position, if the lower notch (2) of the transducer tube is no longer visible

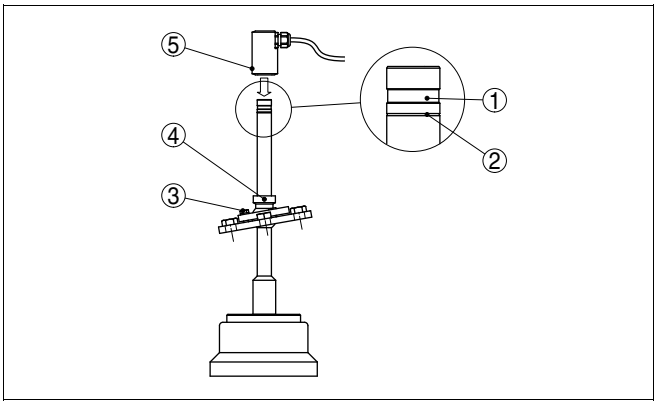

Fig. 6: Mounting - Version C
1 Groove for locking the connection head
2 Notch
3 Screw of swivelling holder (hexagon SW 13)
4 Grub screw, fixing ring (hexagon spanner - size 4)
5 Terminal screws, connection head (hexagon spanner - size 4)

7 Tighten the screws (5) on the cylinder moderately with a hexagon spanner (size 4)

8 Loosen terminal screw of the swivelling holder (3) with a fork spanner (SW 13)

9 Direct the sensor with the swivelling holder to the measured product

10 Fasten the swivelling holder with screw (3), torque max. 20 Nm

11 Secure screw (3) with lacquer or similar to ensure permanent tightness of the swivelling holder

12 Rotate the connection head in such a way that the cable entry points downwards (moisture can drain off). Fasten the cylinder with screws (5); torque max. 5 Nm

13 Insert the plug at the end of the transducer cable into the socket on the remote electronics

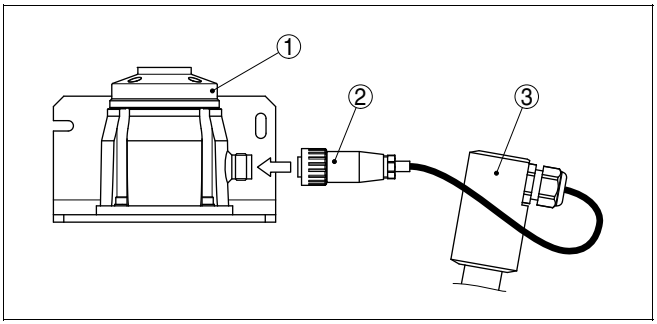

Fig. 7: Plug connector between transcuer and socket electronics housing
1 Socket electronics housing
2 Plug connector
3 Connection piece, transducer tube

Mounting - Version D

Version D is supplied in three parts:

- Transducer
- Transducer cable
- electronics for wall mounting

Assemble the version as follows:

1 Loosen the hexagon nut (3) on the transducer cable

2 Insert the transducer tube from below into the mounting opening G1 A

3 Fasten (SW 46) the hexagon nut (3)

4 Remove the plug from below out of the connection head and plug it into the socket of the transducer tube

5 Plug the connection head to the transducer tube. Do not squeeze any cables. The cylinder is in the correct position, if the lower notch (2) of the transducer tube is no longer visible

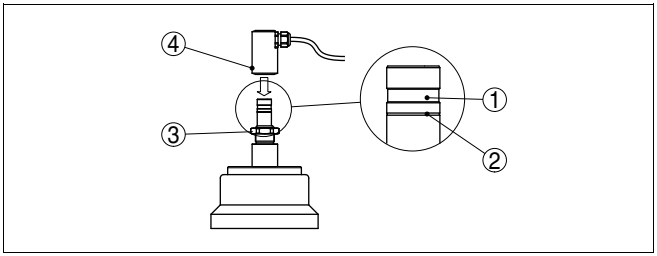

Fig. 8: Mounting - Version D
1 Groove for locking the connection head
2 Notch
3 Hexagon nut SW 46
4 Terminal screws, connection head (hexagon spanner - size 4)

6 Tighten the screws (4) on the cylinder moderately with a hexagon spanner (size 4)

7 Rotate the connection head in such a way that the cable entry points downwards (moisture can drain off). Fasten the cylinder with screws (4); torque max. 5 Nm

8 Insert the plug at the end of the transducer cable into the socket on the remote electronics

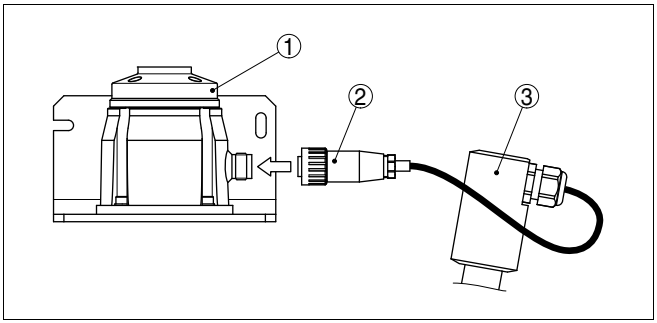

Fig. 9: Plug connector between transcuer and socket electronics housing
1 Socket electronics housing
2 Plug connector
3 Connection piece, transducer tube

4.3 Mounting instructions

Installation position

Mount VEGASON 65 at least 500 mm (19.685 in) from the vessel wall. If the sensor is installed in the center of vessels with dished or round tops, multiple echoes can arise. These can, however, be suppressed by an appropriate adjustment (see "*Setup*").

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

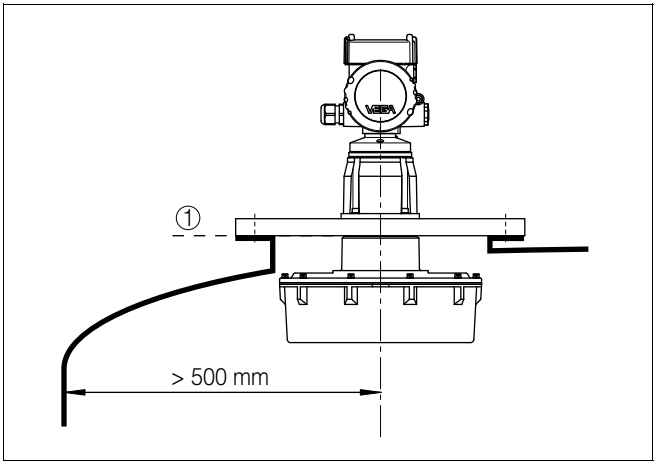

Fig. 10: Installation position
1 Reference plane

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

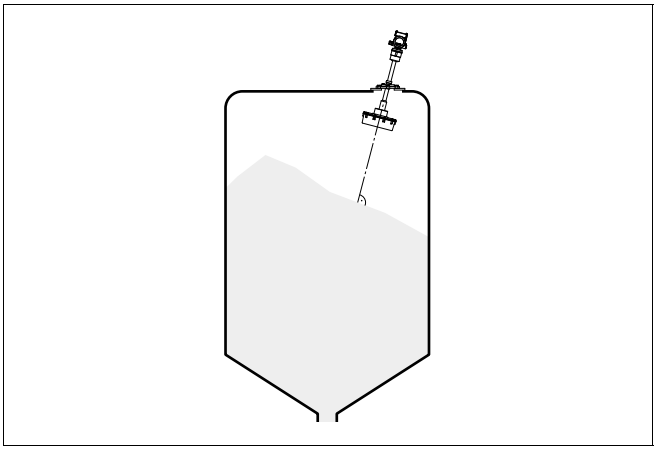

Fig. 11: Vessel with conical bottom

Socket

Preferably the transducer should be mounted without socket flush to the vessel top.

If the reflective properties of the medium are good, you can mount VEGASON 65 on a socket piece. The socket end should be smooth and burr-free, if possible also rounded. Carry out a false echo storage.

Sensor orientation

Direct the sensor in liquids as perpendicular as possible to the product surface to achieve optimum measurement results.

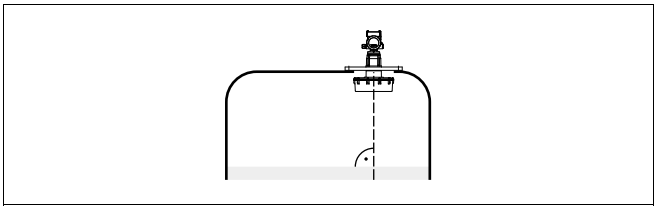

Fig. 12: Orientation in liquids

To optimally align the sensor to solid products, a swivelling holder can be implemented.

Vessel installations

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

Vessel installations such as for example, ladders, limit switches, heating spirals, struts etc. can cause false echoes superimposed on the useful echo. Make sure when planning your measuring site that the ultrasonic signals have "free access" to the measured product.

In case of existing vessel installations, a false echo storage should be carried out during setup.

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.

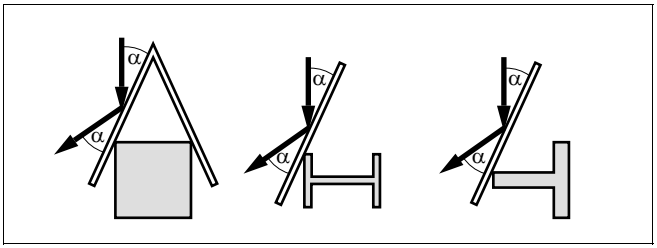

Fig. 13: Cover smooth profiles with deflectors

Agitators

If there are agitators in the vessel, a false echo storage should be carried out with the agitators in motion. This ensures that the interfering reflections from the agitators are saved with the blades in different positions.

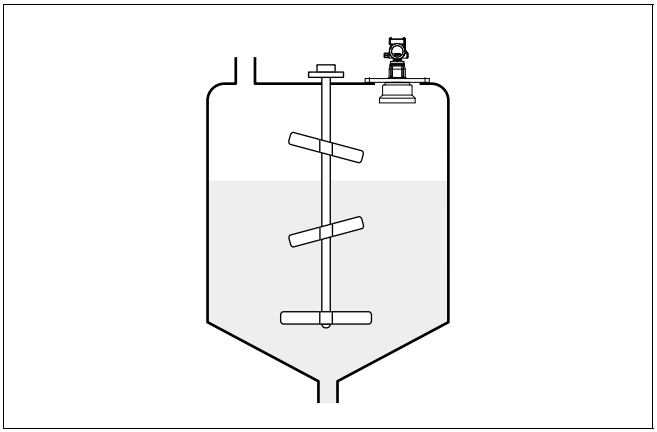

Fig. 14: Agitators

Material heaps

Large material heaps are best measured with several instruments, which can be mounted on e.g. traverse cranes. For this type of application it is advantageous to orient the sensor perpendicular to the bulk solid surface.

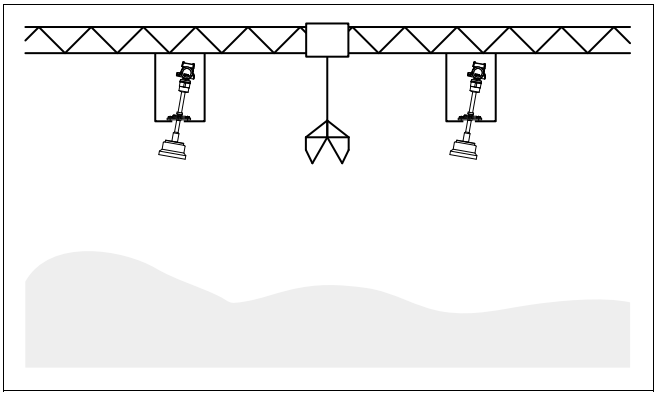

Fig. 15: Transducers on traverse crane

Inflowing medium

Do not mount the instruments in or above the filling stream. Make sure that you detect the product surface and not the inflowing product.

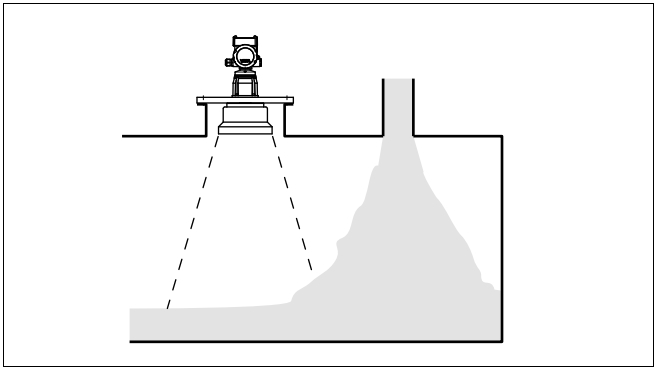

Fig. 16: Inflowing medium

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 are causing measurement errors, the sensor should be used in a standpipe or, alternatively, the more suitable guided radar sensors (TDR) should be used.

Guided radar is not influenced by foam generation and is particularly suitable for such applications.

Air turbulences

If there are strong air currents in the vessel, e.g. due to strong winds in outdoor installations, or because of air turbulence, e. g. by cyclone exhaustion you should mount VEGASON 65 in a standpipe or use a different measuring principle, e.g. radar or guided radar (TDR).

Heat fluctuations

Strong heat fluctuations, e.g. caused by the sun, can cause measurement errors. In this case, you should use a sun shield.

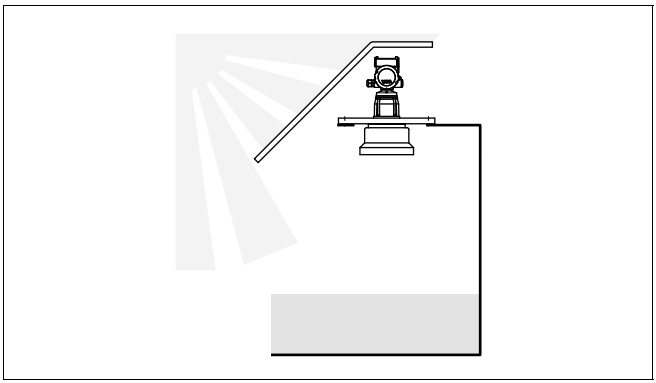

Fig. 17: Heat fluctuations

5 Connecting to power supply

5.1 Preparing the connection

Note safety instructions

Always keep in mind the following safety instructions:

- Connect only in the complete absence of line voltage
- If overvoltage surges are expected, overvoltage arresters should be installed

Tip:
We recommend VEGA overvoltage arresters FS-LB-I and ÜSB 62-36G.X.

Take note of safety instructions for Ex applications

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

Select power supply

Power supply and current output are transmitted via separate two-wire connection cables. The supply voltage range can differ depending on the instrument version. The exact range is stated in the "**Technical data**" in the "**Supplement**".

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

This 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 terminal. Take note of the general installation regulations.

As a rule, connect VEGASON 65 to vessel ground (potential euqalisation) or in case of plastic vessels to the next ground potential. For this purpose, there is a ground terminal on the side of the instrument housing.

Selecting connection cable

For power supply, an approved installation cable with PE conductor is necessary.

The 4 ... 20 mA current output is connected with standard two-wire cable without screen. The outer cable diameter of 5 … 9 mm ensures the seal effect of the cable gland. If strong electromagnetic interference is expected, screened cable should be used.

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Cable screening and grounding

Connect 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 potential equalisation (low impedance).

If potential equalisation currents are expected, the connection on the processing side must be made via a ceramic capacitor (e.g. 1 nF, 1500 V). The low frequency potential equalisation currents are thus suppressed, but the protective effect against high frequency interference signals remains.

Select connection cable for Ex applications

Take note of the corresponding installation regulations for Ex applications. In particular, make sure that no potential equalisation currents flow over the cable screen. In case of grounding on both sides this can be achieved by the use of a capacitor or a separate potential equalisation.

5.2 Connection procedure

Warning:
Before connecting to voltage supply, the plug connection between transducer and remote electronics must be provided in **idle condition** (see illustration below). Non-observance will damage the electronics!

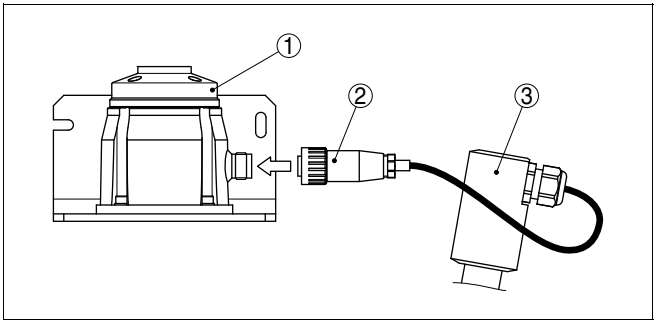


Fig. 18: Plug connector between transcuer and socket electronics housing
1 Socket electronics housing
2 Plug connector
3 Connection piece, transducer tube

Only then, the sensor may be connected to voltage supply.

Proceed as follows:

1 Unscrew the housing cover
2 Loosen compression nut of the cable entry
3 Remove approx. 10 cm (4 in) of the cable mantle (current output), strip approx. 1 cm (0.4 in) insulation from the ends of the individual wires
4 Insert the cable into the sensor through the cable entry
5 Lift the opening levers of the terminals with a screwdriver
6 Insert the wire ends into the open terminals according to the wiring plan
7 Press down the opening levers of the terminals, you will hear the terminal spring closing
8 Check the hold of the wires in the terminals by lightly pulling on them
9 Connect the screen to the internal ground terminal and the external ground terminal to potential equalisation
10 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable
11 Connect the lead cable for power supply in the same way according to the wiring plan, in addition connect the ground conductor to the inner ground terminal.
12 Screw the housing cover back on

The electrical connection is finished.

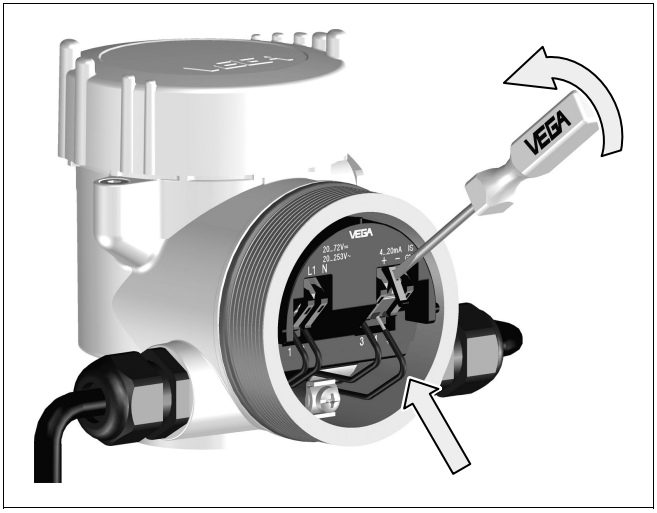


Fig. 19: Connection steps 5 and 6

5.3 Wiring plan, double chamber housing

Housing overview

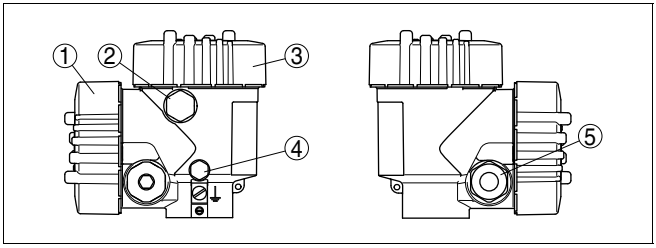


Fig. 20: Double chamber housing
1 Housing cover, connection compartment
2 Blind stopper or plug M12x1 for VEGADIS 61 (option)
3 Housing cover, electronics compartment
4 Filter element for pressure compensation or blind stopper with version IP 66/ IP 68, 1 bar[1)]
5 Cable entry or plug

Electronics compartment

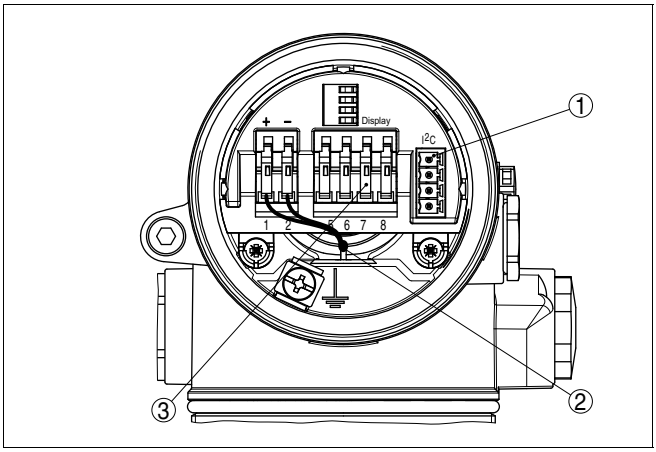


Fig. 21: Electronics compartment, double chamber housing
1 Plug connector for VEGACONNECT (I^2C interface)
2 Internal connection cable to the connection compartment
3 Terminals for VEGADIS 61

1) Version IP 66/IP 68, 1 bar not with four-wire instruments

Connection compartment

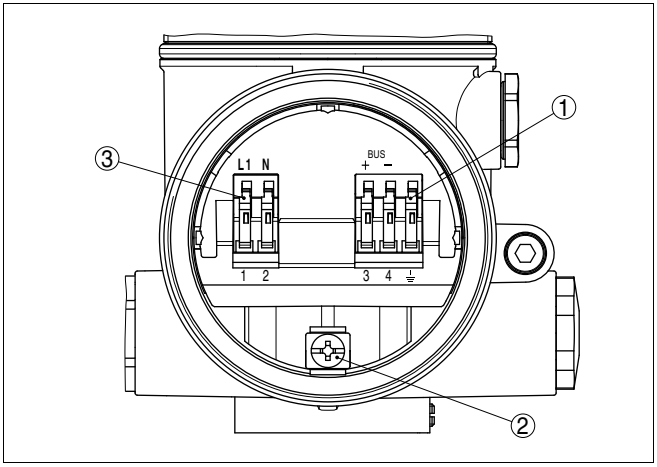


Fig. 22: Connection compartment, double chamber housing
1 Spring-loaded terminals for signal output
2 Ground terminal for connection of the ground conductor and screen
3 Spring-loaded terminals for voltage supply

Wiring plan

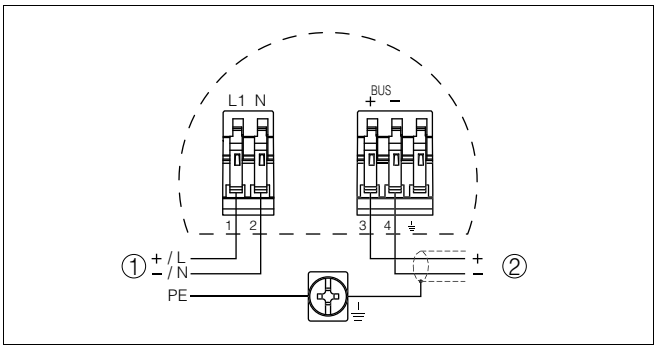


Fig. 23: Wiring plan, double chamber housing
1 Voltage supply
2 Signal output

6 Set up with the indicating and adjustment module PLICSCOM

6.1 Short description

Function/Configuration

The indicating and adjustment module PLICSCOM is used for measured value display, adjustment and diagnosis. It can be mounted in the following housing versions and instruments:

- All sensors of the plics® instrument family, in the single as well as in the double chamber housing (optionally in the electronics or connection compartment)
- External indicating and adjustment unit VEGADIS 61

Note:
You will find detailed information on the adjustment in the operating instructions manual of the "Indicating and adjustment module PLICSCOM".

6.2 Insert indicating and adjustment module

Mount/dismount indicating and adjustment module

The indicating and adjustment module can be inserted into the sensor and removed again at any time. It is not necessary to interrupt the power supply.

Proceed as follows:

1 Unscrew the housing cover

2 Place the indicating and adjustment module in the desired position on the electronics (you can choose any one of four different positions - each displaced by 90°)

3 Press the indicating and adjustment module onto the electronics and turn it to the right until it snaps in.

4 Screw housing cover with inspection window tightly back on

Removal is carried out in reverse order.

The indicating and adjustment module is powered by the sensor, an additional connection is not necessary.

Fig. 24: Installation of the indicating and adjustment module

Note:
If you intend to retrofit VEGASON 65 with an indicating and adjustment module for continuous measured value indication, a higher cover with an inspection glass is required.

6.3 Adjustment system

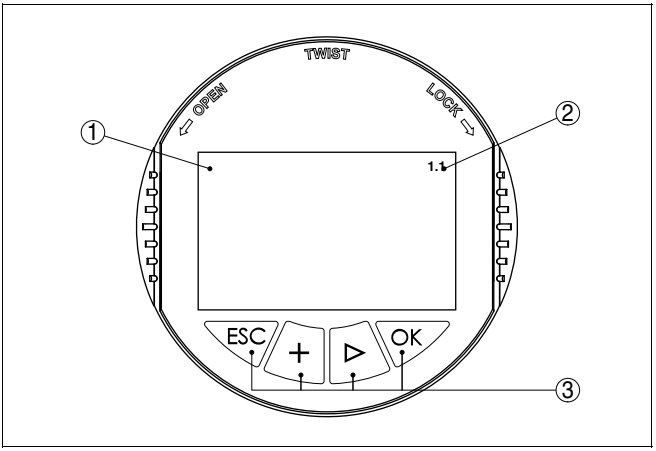


Fig. 25: Indicating and adjustment elements
1 LC display
2 Indication of the menu item number
3 Adjustment keys

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 a parameter
- ***[ESC]*** key:
  - interrupt input
  - jump to the next higher menu

Adjustment system

The sensor is adjusted via the four keys of the indicating and adjustment module. The LC display indicates the individual menu items. The functions of the individual keys are shown in the above illustration. Approx. 10 minutes after the last pressing of a key, an automatic reset to measured value indication is triggered. Any values not confirmed with ***[OK]*** will not be saved.

6.4 Setup procedure

Switch-on phase

After VEGASON 65 is connected to voltage supply or after voltage recurrence, the instrument carries out a self-check for approx. 30 seconds. The following steps are carried out:

- Internal check of the electronics
- Indication of the instrument type, the firmware as well as the sensor TAGs (sensor designation)
- Status byte goes briefly to fault value

Then the current measured value will be displayed and the corresponding digital output signal will be outputted to the cable.[2)]

Parameter adjustment

As VEGASON 65 is a distance measuring instrument, the distance from the sensor to the product surface is measured. To have the real product level displayed, an allocation of the measured distance to the percentage height must be made. To carry out this adjustment, the distance is entered with full and empty vessel. If these values are not known, an adjustment with the distance values, e.g. 10 % and 90 % is also possible. Starting point for these distance specifications is always the the lower side of the flange (flange version, for all other versions the lower side of the transducer.

The actual level is then calculated on the basis of these entered values. At the same time, the operating range of the sensor is limited from maximum range to the requested range.

The real product level during this adjustment is not important, because the min./max. adjustment is always carried out without changing the product level. These settings can be made ahead of time without the instrument having to be installed.

In the main menu item "*Basic adjustment*", the individual submenu items should be selected one after the other and provided with the correct parameter values.

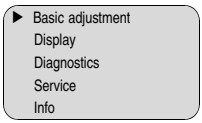
Start your parameter adjustment with the following menu items of the basic adjustment:

Carrying out min. adjustment

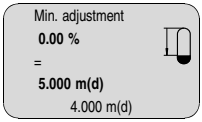
Proceed as follows:

1 Move from the measured value display to the main menu by pushing ***[OK]***.

[2)] The values correspond to the actual measured level as well as to the settings already carried out, e.g. default setting.



2 Select the menu item "*Basic adjustment*" with ***[->]*** and confirm with ***[OK]***. Now the menu item "*Min. adjustment*" is displayed.



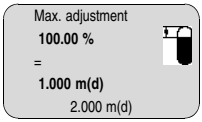
3 Prepare the % value for editing with ***[OK]*** and set the cursor to the requested position with ***[->]***. Set the requested percentage value with ***[+]*** and save with ***[OK]***. The cursor jumps now to the distance value.

4 Enter the appropriate distance value in m (corresponding to the percentage value) for the empty vessel (e.g. distance from the sensor to the vessel bottom).

5 Save the settings with ***[OK]*** and move to "Max. adjustment" with ***[->]***.

Carrying out max. adjustment

Proceed as follows:



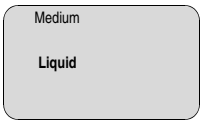
1 Prepare the % value for editing with ***[OK]*** and set the cursor to the requested position with ***[->]***. Set the requested percentage value with ***[+]*** and save with ***[OK]***. The cursor jumps now to the distance value.

2 Enter the appropriate distance value in m (corresponding to the percentage value) for the full vessel. Keep in mind that the max. level must lie below the dead band.

3 Save the settings with ***[OK]*** and move to "Medium selection" with ***[->]***.

Medium selection

Each product has different reflective properties. In addition, there are various interfering factors which have to be taken into account: agitated product surfaces and foam generation (with liquids); dust generation, material cones and echoes from the vessel wall (with solids). To adapt the sensor to these different conditions, you should first select "*Liquid*" or "*Solid*".



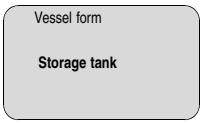
With solids, you can also choose between "*Powder/Dust*", "*Granular/Pellets*" or "*Ballast/Pebbels*".

Through this additional selection, the sensor is adapted perfectly to the product and measurement reliability, particularly in products with bad reflective properties, is considerably increased.

Enter the requested parameter via the appropriate keys, save your settings and jump to the next menu item with the ***[->]*** key.

Vessel form

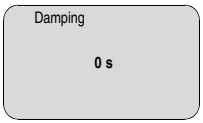
Apart from the medium, the vessel shape can also influence the measurement. To adapt the sensor to these measuring conditions, this menu item offers different options depending on whether liquid or solid is selected. With "*Liquids*" these are "*Storage tank*", "*Stilling tube*", "*Open vessel*" or "*Stirred vessel*", with "*Solid*", "*Silo*" or "*Bunker*".



Enter the requested parameter via the appropriate keys, save your settings and jump to the next menu item with the ***[->]*** key.

Damping

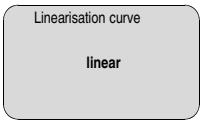
To suppress fluctuations in the measured value display, e.g. caused by an agitated product surface, an integration time can be set. This time can be between 0 and 999 seconds. Keep in mind that the reaction time of the entire measurement will then be longer and the sensor will react to measured value changes with a delay. In general, a period of a few seconds is sufficient to smooth the measured value display.



Enter the requested parameter via the appropriate keys, save your settings and jump to the next menu item with the ***[->]*** key.

Linearisation curve

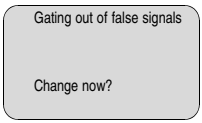
A linearization is necessary for all vessels in which the vessel volume does not increase linearly with the level - e.g. with a cylindrical or spherical tank - and the indication or output of the volume is required. Corresponding linearization curves are preprogrammed for these vessels. They represent the correlation between the level percentage and vessel volume. By activating the appropriate curve, the volume percentage of the vessel is displayed correctly. If the volume should not be displayed in percent but e.g. in l or kg, a scaling can be also set in the menu item "*Display*".



Enter the requested parameter via the appropriate keys, save your settings and jump to the next menu item with the ***[->]*** key.

Gating out of false signals

High sockets or vessel installations, such as e.g. struts or agitators as well as buildup and weld joints on the vessel walls cause interfering reflections which can impair the measurement. A false echo storage detects and marks these false echoes, so that they are no longer taken into account for the level measurement. A false echo memory should be created with empty vessel so that all potential interfering reflections will be detected.



Proceed as follows:

1 Move from the measured value display to the main menu by pushing ***[OK]***.

2 Select the menu item "*Service*" with ***[->]*** and confirm with ***[OK]***. Now the menu item "*False signal suppression*" is displayed.

3 Confirm "*False signal suppression - Change now*" with ***[OK]*** and select in the below menu "*Create new*". Enter the actual distance from the sensor to the product surface. All false signals in this area are detected by the sensor and saved after confirming with ***[OK]***.

Note:
Check the distance to the product surface, because if an incorrect (too large) value is entered, the existing level will be saved as false signal. The filling level would then no longer be detectable in this area.

Copy sensor data

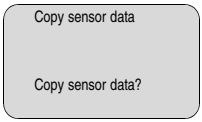
This function enables reading out parameter adjustment data as well as writing parameter adjustment data into the sensor via the indicating and adjustment module PLICSCOM. A description of the function is available in the operating instructions manual "*Indicating and adjustment module PLICSCOM*".

The following data are read out or written with this function:

- Measured value presentation
- Adjustment
- Medium
- Vessel form
- Damping
- Linearisation curve
- Sensor-TAG
- Displayed value
- Unit of measurement
- Language

The following safety-relevant data are **not** read out or written:

- PIN



Reset

Basic adjustment

If the "*Reset*" is carried out, the sensor resets the values of the following functions to the reset values (see chart):[3)]

Function	Reset value
Max. adjustment	0 m(d)
Min. adjustment	Meas. range end in m(d)[4)]
Medium	Liquid
Vessel form	not known

[3)] Sensor-specific basic adjustment.
[4)] Depending on the senso type, see "Technical data".

Damping	0 s
Linearization	linear
Sensor-TAG	Sensor
Displayed value	AI-Out
Unit of measurement	m(d)

The values of the following functions are *not* reset to the reset values (see chart) with "**Reset**":

Function	**Reset value**
Language	no reset

Factory setting
Like basic setting, in addition special parameters are reset to default values.[5)]

Pointer
The min. and max. distance and temperature values are reset to the actual value.

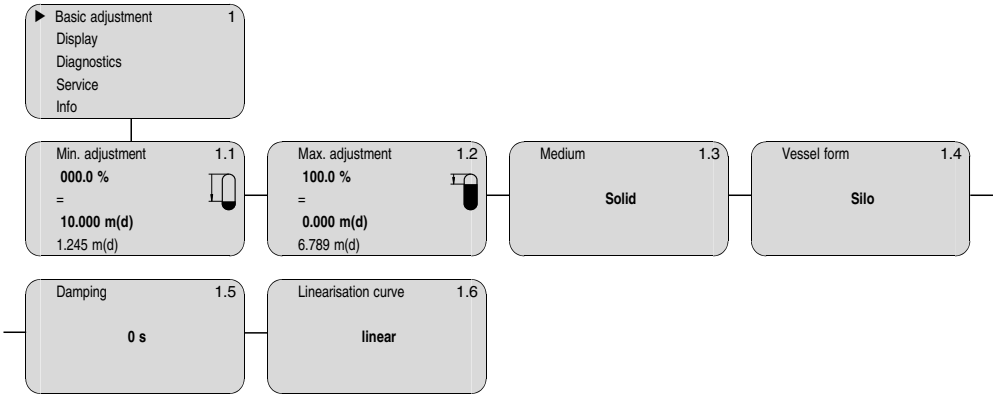
Optional settings

Additional adjustment and diagnosis options such as e.g. scaling, simulation or trend curve presentation are shown in the following menu schematic. You will find a detailed description of these menu items in the operating instructions manual "*Indicating and adjustment module*".

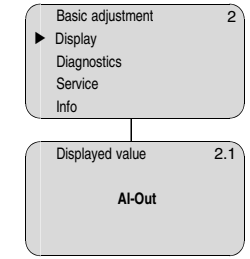
[5)] Special parameters are parameters which are set customer-specifically on the service level with the adjustment software PACTware™.

6.5 Menu schematic

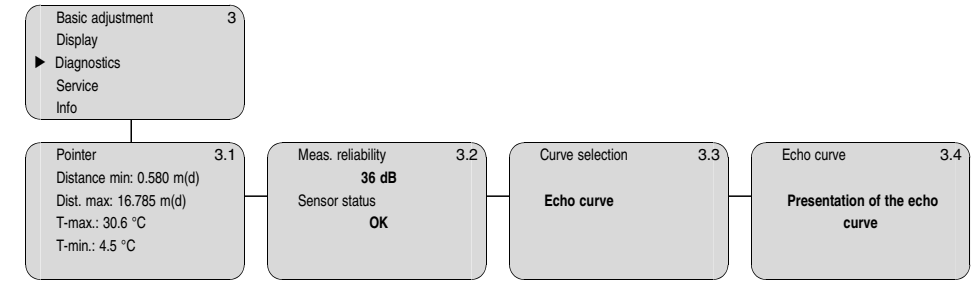
Basic adjustment



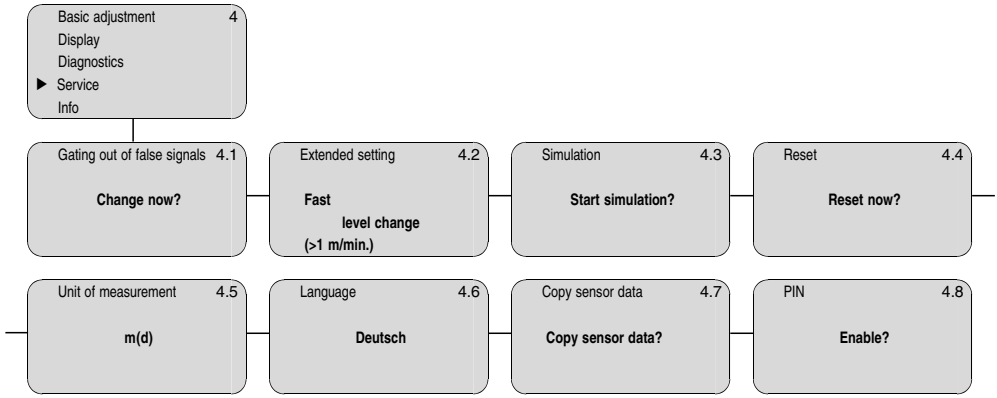
Display



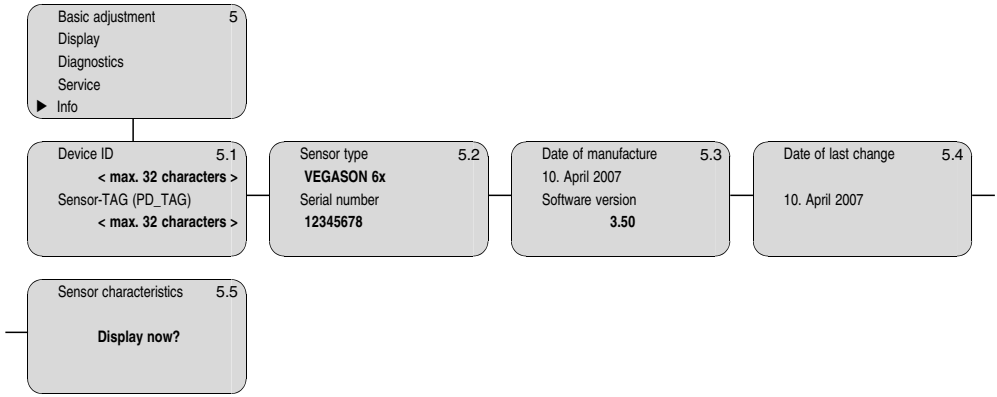
Diagnostics



Service



Info



6.6 Saving the parameter adjustment data

It is recommended noting the adjusted data, e.g. in this operating instructions manual and archive them afterwards. They are hence available for multiple use or service purposes.

If VEGASON 65 is equipped with an indicating and adjustment module, the most important data can be read out of the sensor into indicating and adjustment module. The procedure is described in the operating instructions manual "*Indicating and adjustment module*" in the menu item "*Copy sensor data*". The data remain there permanently even if the sensor power supply fails.

If it is necessary to exchange the sensor, the indicating and adjustment module is inserted into the replacement instrument and the data are written into the sensor under the menu item "*Copy sensor data*".

7 Setup with PACTware™ and other adjustment programs

7.1 Connect the PC via VEGACONNECT 3

Connection via I²C interface

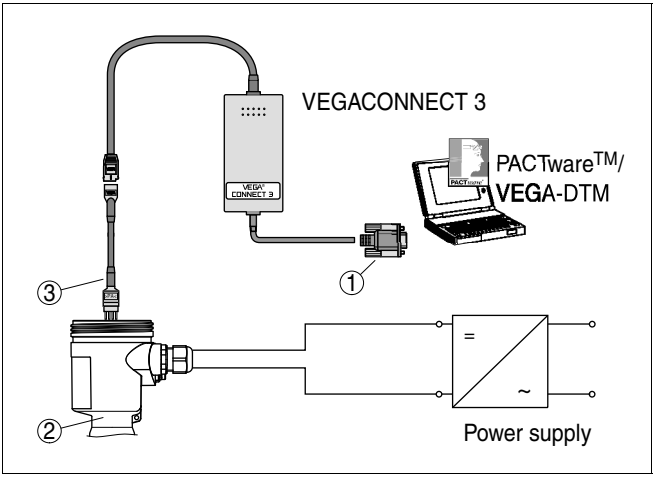


Fig. 26: Connection of the PC via I²C-C interface directly on the sensor
1 RS232 connection
2 VEGASON 65
3 I²C adapter cable for VEGACONNECT 3

Necessary components:

- VEGASON 65
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 with I²C adapter cable (article no. 2.27323)
- Power supply unit

7.2 Connect the PC via VEGACONNECT 4

Internal connection via I²C interface

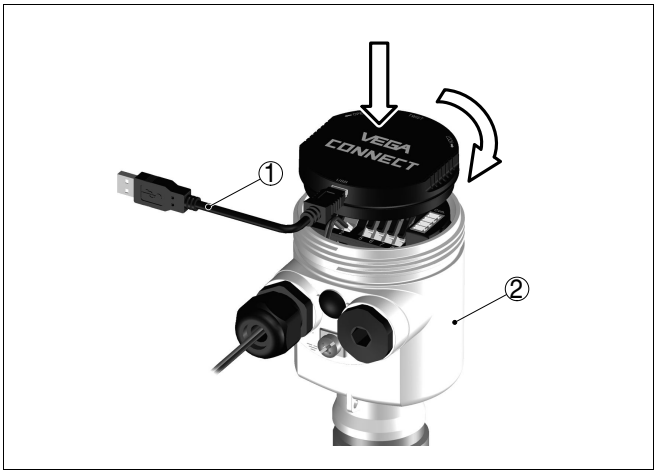


Fig. 27: Connection of the PC via I²C interface directly on the sensor
1 USB cable
2 Sensor

External connection via I²C interface

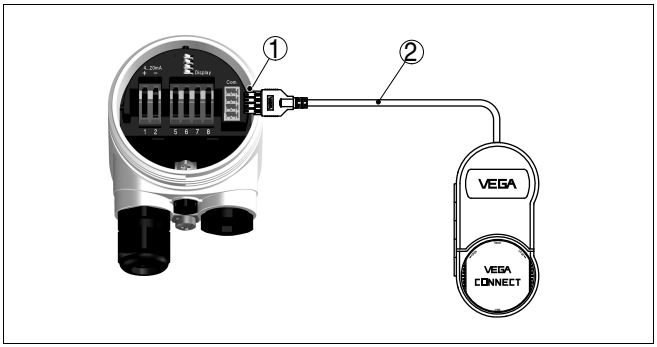


Fig. 28: Connection directly to the sensor
1 I²C bus (Com.) interface
2 I²C connection cable of VEGACONNECT 4

Necessary components:

- VEGASON 65
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 4
- Power supply unit or processing system

7.3 Parameter adjustment with PACTware™

Further setup steps are described in the operating instructions manual "*DTM Collection/PACTware™*" attached to each CD and which can also be downloaded from our homepage. A detailed description is available in the online help of PACTware™ and the VEGA DTMs.

Note:
Keep in mind that for setup of VEGASON 65, DTM-Collection in the actual version must be used.

All currently available VEGA DTMs are provided in the DTM Collection on CD and can be obtained from the responsible VEGA agency for a token fee. This CD includes also the up-to-date PACTware™ version. The basic version of this DTM Collection incl. PACTware™ is also available as a free-of-charge download from the Internet.

Go via www.vega.com and "*Downloads*" to the item "*Software*".

7.4 Parameter adjustment with AMS™

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

Go via www.vega.com and "*Downloads*" to the item "*Software*".

7.5 Saving the parameter adjustment data

It is recommended to document or save the parameter adjustment data. They are hence available for multiple use or service purposes.

The VEGA DTM Collection and PACTware™ in the licensed, professional version provide suitable tools for systematic project documentation and storage.

8 Maintenance and fault rectification

8.1 Maintenance

When used as directed in normal operation, VEGASON 65 is completely maintenance free.

8.2 Remove interferences

Causes of malfunction

VEGASON 65 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Supply
- Signal processing

Fault clearance

The first measures to be taken are to check the output signals as well as to evaluate the error messages via the indicating and adjustment module. The procedure is described below. Further comprehensive diagnostics can be carried out on a PC with the software PACTware™ and the suitable DTM. In many cases, the causes can be determined in this way and faults can be rectified.

24 hour service hotline

However, should these measures not be successful, call the VEGA service hotline in urgent cases under the phone no. **+49 1805 858550**.

The hotline is available to you 7 days a week round-the-clock. Since we offer this service world-wide, the support is only available in the English language. The service is free of charge, only the standard telephone costs will be charged.

Checking Foundation Fieldbus

? When an additional instrument is connected, the H1 segment fails.

- Max. supply current of the segment coupler exceeded

→ Measure the current consumption, reduce size of segment

? Measured value on the indicating and adjustment module does not correspond to the value in the PLC

- The menu item "*Display - Display value*" is not set to "*AI-Out*"

→ Check values and correct, if necessary

? Instrument does not appear during connection setup

- Incorrect termination

→ Check termination at the beginning and end points of the bus and terminate, if necessary, according to the specification

- Instrument not connected to the segment

→ Check and correct

In Ex applications, the regulations for the wiring of intrinsically safe circuits must be observed.

Fault messages via the indicating/adjustment module

? E013

- no measured value available

→ sensor in boot phase

→ sensor does not find an echo, e.g. because of faulty installation or incorrect parameter adjustment

? E017

- Adjustment span too small

→ Carry out a fresh adjustment and increase the distance between min. and max. adjustment

? E036

- no operable sensor software

→ Carry out a software update or send the instrument for repair

? E041

- Hardware error, electronics defective

→ Exchange instrument or return instrument for repair

? E113

- Communication conflict

→ Exchange instrument or return instrument for repair

8.3 Exchange of the electronics module

If the electronics module is defective, it can be replaced by the user.

In Ex applications only one instrument and one oscillator with respective Ex approval may be used.

If there is no electronics module available on site, one can be ordered from the VEGA agency serving you.

Sensor serial number

The order data of the sensor must be downloaded into the new electronics module. This can be done:

- at the factory by VEGA
- or on site by the user

In both cases, the sensor serial number is necessary. The serial numbers are stated on the type label of the instrument, inside the housing or on the delivery note.

Information:
When loading on site, first of all the order data must be downloaded from the Internet (see operating instructions manual "*Oscillator*").

Assignment

The oscillators are adapted to the respective sensor and differ also in the signal output or power supply. The suitable oscillator is listed in the following overview.

Foundation Fieldbus

Electronics module SN-E.64F suitable for VEGASON 64, 65, 66 - Foundation Fieldbus:

- SN-E.64F**X** (X = without approvals)
- SN-E.64V**D** (D = with approval CX, UX, UF according to VEGA product list)
- SN-E.64V**G** (G = with approval GX according to VEGA product list)

8.4 Instrument repair

If a repair is necessary, please proceed as follows:

You can download a return form (23 KB) from the Internet on our homepage www.vega.com under: "*Downloads - Forms and certificates - Repair form*".

By doing this you help us carry out the repair quickly and without having to call for needed information.

- Print and fill out one form per instrument
- Clean the instrument and pack it damage-proof
- Attach the completed form and, if need be, also a safety data sheet outside on the packaging

- Please ask the agency serving you for the address of your return shipment. You can find the respective agency on our website www.vega.com under: "*Company - VEGA worldwide*"

9 Dismounting

9.1 Dismounting steps

Danger:
Individual wires of the transducer cable have a voltage of approx. 70 V during operation (see chapter "*Mounting preparations*"). There is danger of electric shocks! Therefor dismount VEGASON 65 only in idle condition.

Warning:
Before separating the transducer cable (see chapter "*Mounting preparations*", example see illustration below), **idle condition** must be provided. Non-observance can cause damage on the electronics!

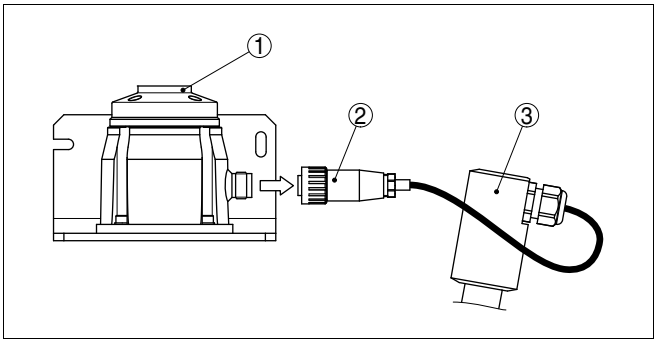


Fig. 29: Plug connector between transcuer and socket electronics housing
1 Socket electronics housing2
Plug connector on the transducer cable3
Connection piece, transducer tube

Take note of chapters "*Mounting*" and "*Connecting to power supply*" and carry out the listed steps in reverse order.

9.2 Disposal

The instrument consists of materials which can be recycled by specialised recycling companies. We use recyclable materials and have designed the electronics to be easily separable.

WEEE directive 2002/96/EG
This instrument is not subject to the WEEE directive 2002/96/EG and the respective national laws (in Germany, e.g. ElektroG). Pass the instrument directly on to a specialised

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recycling company and do not use the municipal collecting points. These may be used only for privately used products according to the WEEE directive.

Correct disposal avoids negative effects to persons and environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you cannot dispose of the instrument properly, please contact us about disposal methods or return.

10 Supplement

10.1 Technical data

General data

Materials, wetted parts	
– Flange	PP or Alu
– Swivelling holder, flange	galvanized steel
– Transducer	UP
– Transducer diaphragm	Alu with PE foam rubber coating
Materials, non-wetted parts	
– Housing	Alu die-casting powder-coated
– Seal ring between housing and housing cover	Silicone
– Inspection window in housing cover for indicating and adjustment module	Polycarbonate (UL-746-C listed)
– Ground terminal	316Ti/316L
– transducer cable with separate version C and D	PUR (1.1082)
Weight[6]	
– compact with flange (version A)	8 … 13.3 kg (17.6 … 29.3 lbs)
– compact with swivelling holder (version B)	8.7 … 10.3 kg (19.1 … 22.7 lbs)
– separate with swivelling holder (version C)	9.2 … 11.1 kg (20.3 … 24.5 lbs)
– separate with threaded fitting (version D)	6.5 … 7.5 kg (14.3 … 16.5 lbs)

Output variable

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

[6] Depending on size and process fitting material.

– Channel 3	Secondary Value 2
– Channel 4	Temperature Value
Transmission rate	31.25 Kbit/s
Current value	10 mA, ±0.5 mA

Input variable

Parameter	
– Version A	distance between lower edge of the flange and product surface
– version B, C and D	distance between lower edge of the transducer and product surface
Dead zone	0.8 m (2.6 ft)
Measuring range	
– Liquids	up to 45 m (147.6 ft)
– Solids	up to 25 m (82 ft)

Reference conditions to measuring accuracy (similar to DIN EN 60770-1)

Reference conditions according to DIN EN 61298-1	
– Temperature	+18 … +30 °C (+64 … +86 °F)
– Relative humidity	45 … 75 %
– Air pressure	860 … 1060 mbar/86 … 106 kPa (12.5 … 15.4 psi)
Other reference conditions	
– Reflector	ideal reflector, e.g. metal plate 2x2 m (6.56x6.56 ft)
– False reflections	Biggest false echo, 20 dB smaller than the useful echo

Measuring characteristics

Ultrasonic frequency	18 kHz
Interval	>2 s (dependent on the parameter adjustment)
Beam angle at -3 dB	5°
Adjustment time[7)]	>3 s (dependent on the parameter adjustment)

[7)] Time to output the correct level (with max. 10 % deviation) after a sudden level change.

Measuring accuracy

Resolution, general	max. 1 mm
Deviation[8)]	see diagram

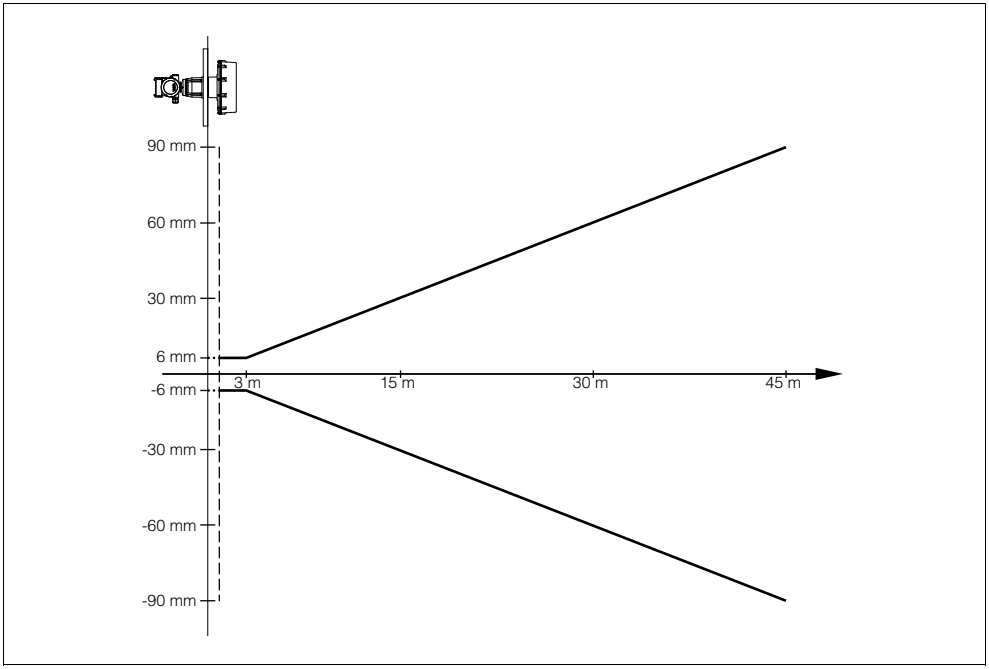

Fig. 30: Deviation VEGASON 65 version A in mm, measuring range in m

8) Incl. non-linearity, hysteresis and non-repeatability.

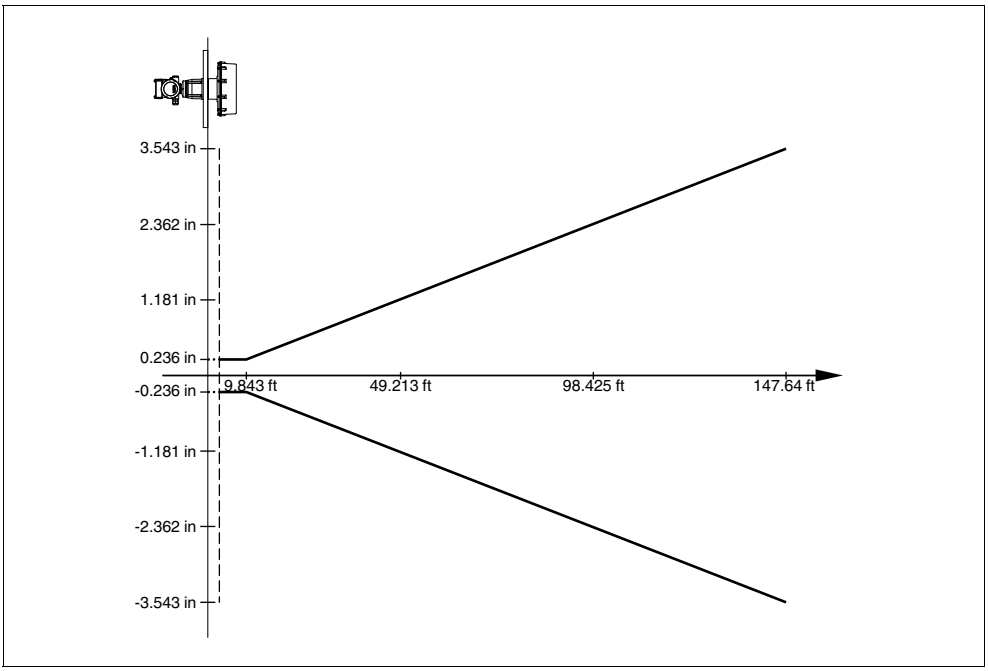

Fig. 31: Deviation VEGASON 65 version A in Inch, measuring range in ft

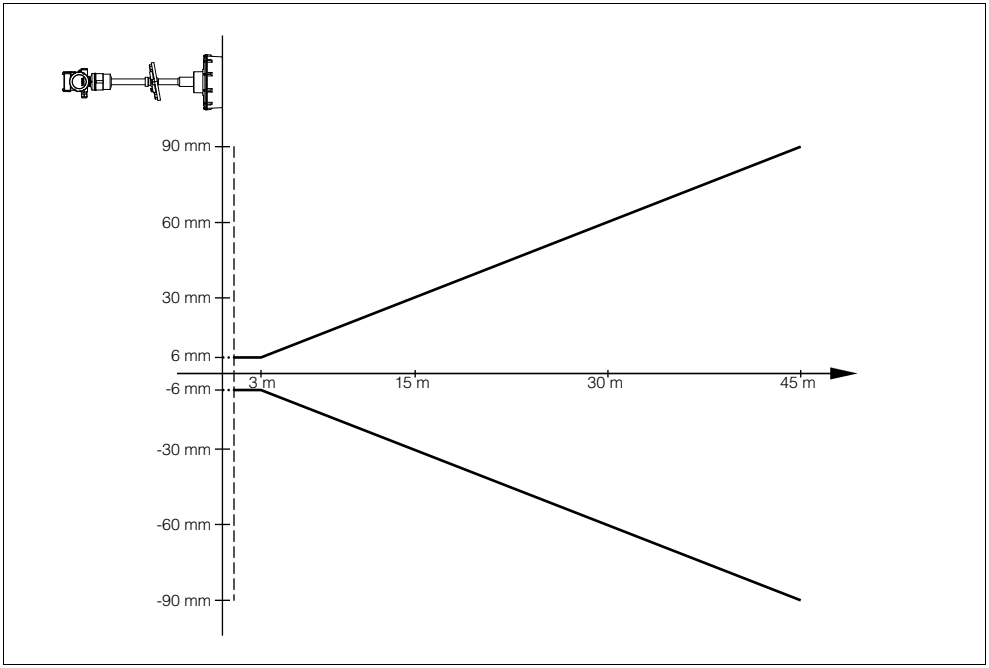

Fig. 32: Deviation VEGASON 65 version B, C, D in mm, measuring range in m

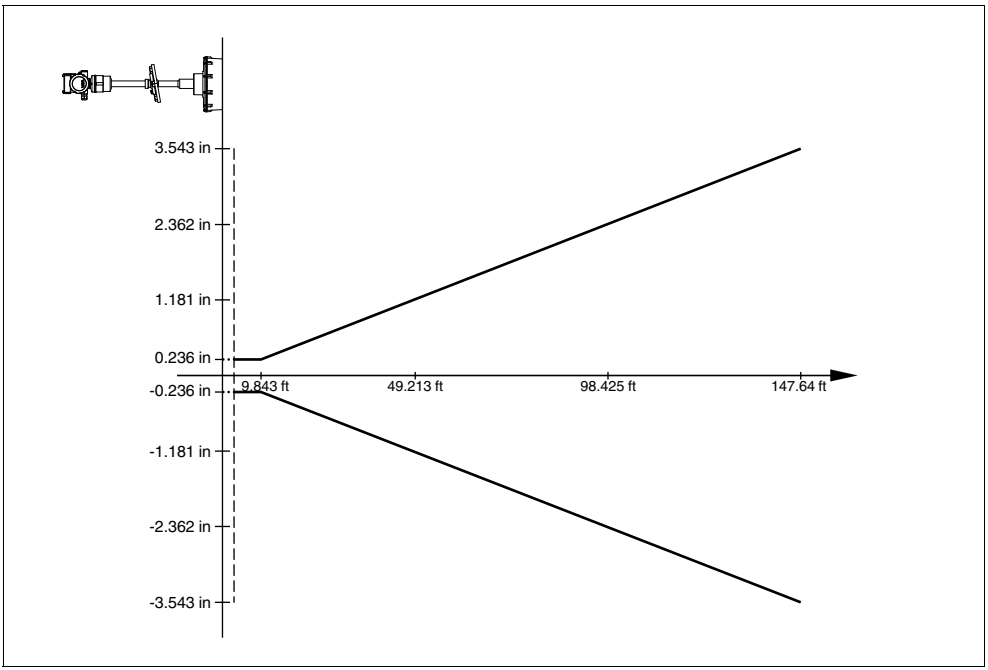

Fig. 33: Deviation VEGASON 65 version B, C, D in Inch, measuring range in ft

Influence of the ambient temperature to the sensor electronics[9)]

Average temperature coefficient of the zero signal (temperature error)	0.06 %/10 K

Ambient conditions

Ambient, storage and transport temperature	-40 … +80 °C (-40 … +176 °F)

Process conditions

Vessel pressure

– Version A with PP flange	0 kPa
– other versions	-20 … 50 kPa/-0.2 … 0.5 bar (-2.9 … 7.3 psi)
Process temperature (transducer temperature)	-40 … +80 °C (-40 … +176 °F)

9) Relating to the nominal measuring range.

Vibration resistance	mechanical vibration with 1 g in the frequency range 5 … 200 Hz[10]

Electromechanical data

Cable entry	
– Double chamber housing	• 1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional) or: • 1x closing cap ½ NPT, 1x blind stopper ½ NPT, plug M12x1 for VEGADIS 61 (optional) or: • 1x plug (depending on the version), 1x blind stopper M20x1.5, plug M12x1 for VEGADIS 61 (optional)
Spring-loaded terminals	for wire cross-sections up to 2.5 mm²
Transducer cable[11]	
– Length	5 … 300 m (16.4 … 984.3 ft)
– Diameter	7.2 … 7.6 mm

Indicating and adjustment module

Power 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

Voltage supply

Supply voltage	
– Non-Ex and Exd instrument	20 … 72 V DC, 20 … 253 V AC, 50/60 Hz
Power consumption	max. 4 VA; 2.1 W

[10] Tested according to the regulations of German Lloyd, GL directive 1
[11] With separate version C and D.

Electrical protective measures	
Protection	IP 66/IP 67
Overvoltage category	III
Protection class	I

Approvals

ATEX II 1/2 D IP 66 T

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10.2 Foundation Fieldbus

Block diagram, measured value processing

The following illustration shows the Transducer Block (TB) and Function block (FB) in simplified form:

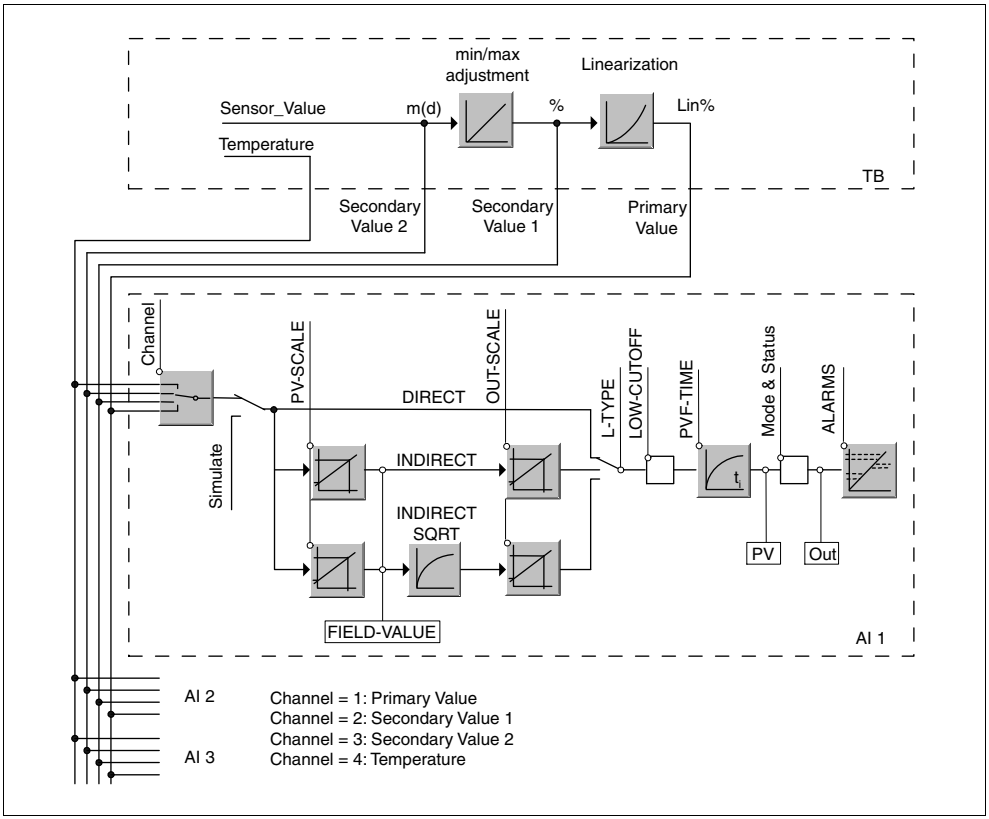


Fig. 34: VEGASON 65 measured value processing

Diagram, adjustment

The following illustration shows the function of the adjustment:

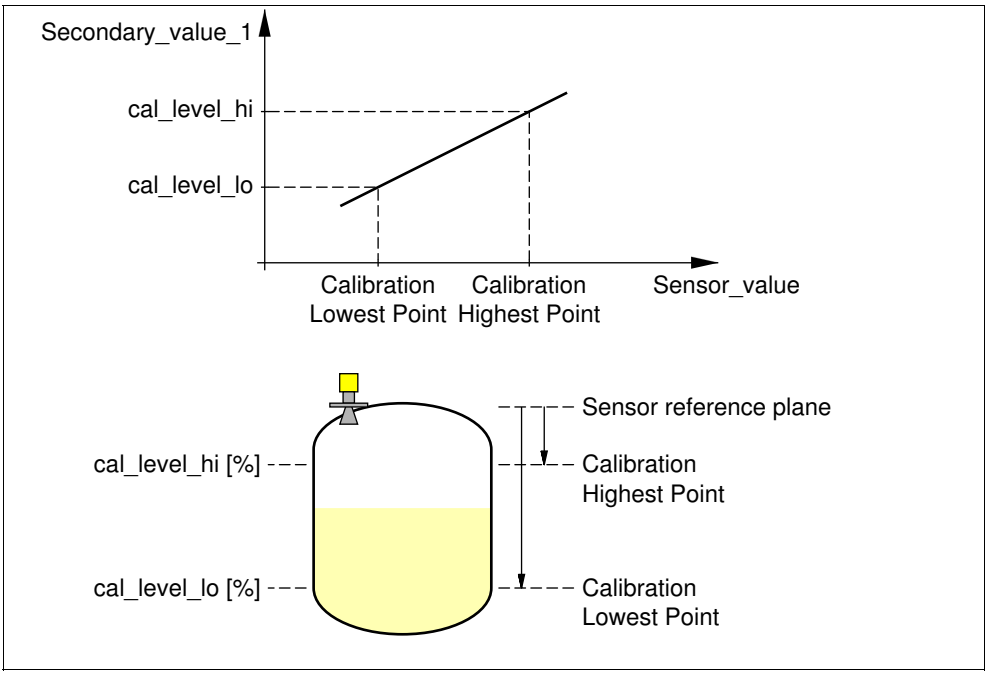


Fig. 35: Adjustment VEGASON 65

Parameter list for Device revision 3.0
The following list contains the most important parameters and their meaning:

- primary_value
  - This is the process value after adjustment and Linearization with the status of the transducer block
- primary_value_unit
  - Unit code of 'Primary_value'
- secondary_value_1
  - Value after min./max.-adjustment (level + level offset). Selected as input to AIFB by setting 'Channel' = 2. Unit derives from 'Secondary_value_1_unit'
- secondary_value_1_unit
  - Unit code of 'Secondary_value_1'
- secondary_value_2
  - Sensor value + sensor offset. Selected as input to AIFB by setting 'Channel' = 3. Unit derives from 'Secondary_value_2_unit'
- secondary_value_2_unit
  - Unit code of 'Secondary_value_2'

- sensor_value
  - Raw sensor value, i.e. the uncalibrated measurement value from the sensor. Unit derives from 'Sensor_range.unit'
- sensor_range
  - Sensor_range.unit' refers to 'Sensor_value', 'Max/Min_peak_sensor_value', 'Cal_point_hi/lo'
- simulate_primary_value
- simulate_secondary_value_1
- simulate_secondary_value_2
- Device Status
- Linearization Type
  - Possible types of linearization are: linear, user defined, cylindrical lying container, spherical container
- CURVE_POINTS_1_10
  - X and Y values for the user defined linearization curve
- CURVE_POINTS_11_20
  - X and Y values for the user defined linearization curve
- CURVE_POINTS_21_30
  - X and Y values for the user defined linearization curve
- CURVE_POINTS_31_33
  - X and Y values for the user defined linearization curve
- CURVE_STATUS
  - Result of table plausibility check
- SUB_DEVICE_NUMBER
- SENSOR_ELEMENT_TYPE
- display_source_selector
  - Selects the type of value, which is displayed on the PLICSCOM module
- max_peak_sensor_value
  - Holds the maximum sensor value. Write access resets to current value. Unit derives from 'Sensor_range.unit'
- min_peak_sensor_value
  - Holds the minimum sensor value. Write access resets to current value. Unit derives from 'Sensor_range.unit'
- CAL_POINT_HI
  - Min./max.-adjustment: Upper calibrated point of the sensor. It refers to 'Cal_level_hi'. The unit is defined in 'Sensor_range.unit' hi
- CAL_POINT_LO
  - Min./max.-adjustment: Lower calibrated point of the sensor. It refers to 'Cal_level_lo'. The unit is defined in 'Sensor_range.unit'
- CAL_LEVEL_HI

- Min./max.-adjustment: Level at 'Cal_point_hi'. When writing 'Cal_level_hi' and 'Cal_type' = 1 (Online) the 'Cal_point_hi' is automatically set to the current sensor value. The unit is defined in 'Level_unit'

- CAL_LEVEL_LO
  - Min./max.-adjustment: Level at 'Cal_point_lo'. When writing 'Cal_level_lo' and 'Cal_type' = 1 (Online), the 'Cal_point_lo' is automatically set to the current sensor value. The unit is defined in 'Level_unit'
- CAL_TYPE
  - Min./max.-adjustment: Defines type of calibration: Dry: no influence of sensor value. Online: current sensor value determines 'Cal_point_hi/lo'
- level
  - Value after min./max.-adjustment
- level_unit
  - Unit code of 'Level', 'Level_offset', 'Cal_level_hi', 'Cal_level_lo'
- level_offset
  - Offset that is added to the 'Level' value. Unit derives from 'Level_unit'
- SENSOR_OFFSET
  - Offset that is added to the 'Sensor_value'. Unit derives from 'Sensor_range.unit'
- end_of_operation_range
  - Set up to suit the process conditions
- begin_of_operation_range
  - Set up to suit the process conditions
- product_type
  - Set up to suit the process conditions. If Special-Parameter adjustment has been utilized this parameter cannot be written
- liquids_medium_type
  - Set up to suit the process conditions. If Special-Parameter adjustment has been utilized this parameter cannot be written
- solids_medium_type
  - Set up to suit the process conditions. If Special-Parameter adjustment has been utilized this parameter cannot be written
- liquids_vessel_type
  - Set up to suit the process conditions. If Special-Parameter adjustment has been utilized this parameter cannot be written
- solids_vessel_type
  - Set up to suit the process conditions. If Special-Parameter adjustment has been utilized this parameter cannot be written
- fast_level_change
  - Set up to suit the process conditions. If Special-Parameter adjustment has been utilized this parameter cannot be written

- first_echo_factor
  - Set up to suit the process conditions
- pulse_velocity_correction
  - Set up to suit the process conditions
- echo_quality
  - Signal/Noise ratio
- empty_vessel_curve_corr_dist
  - Distance from the sensor to the product surface. Unit derives from 'Sensor_range.unit'
- empty_vessel_curve_corr_op_code
  - Update, create new or delete the empty vessel curve
- sound_velocity
  - Set up to suit the process conditions
- sound_velocity_unit
  - Unit code of 'Sound_velocity'
- Temperature
  - Process temperature. Selected as input to AIFB by setting 'Channel' = 4. Unit derives from 'Temperature.unit'
- temperature_unit
  - Unit code of 'Temperature', 'Max./Min._peak_temperature_value'
- max_peak_temperature_value
  - Holds the maximum process temperature. Write access resets to current value. Unit derives from 'Temperature.unit'
- min_peak_temperature_value
  - Holds the minimum process temperature. Write access resets to current value. Unit derives from 'Temperature.unit'

10.3 Dimensions

Housing

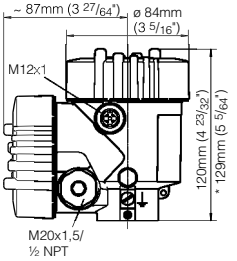
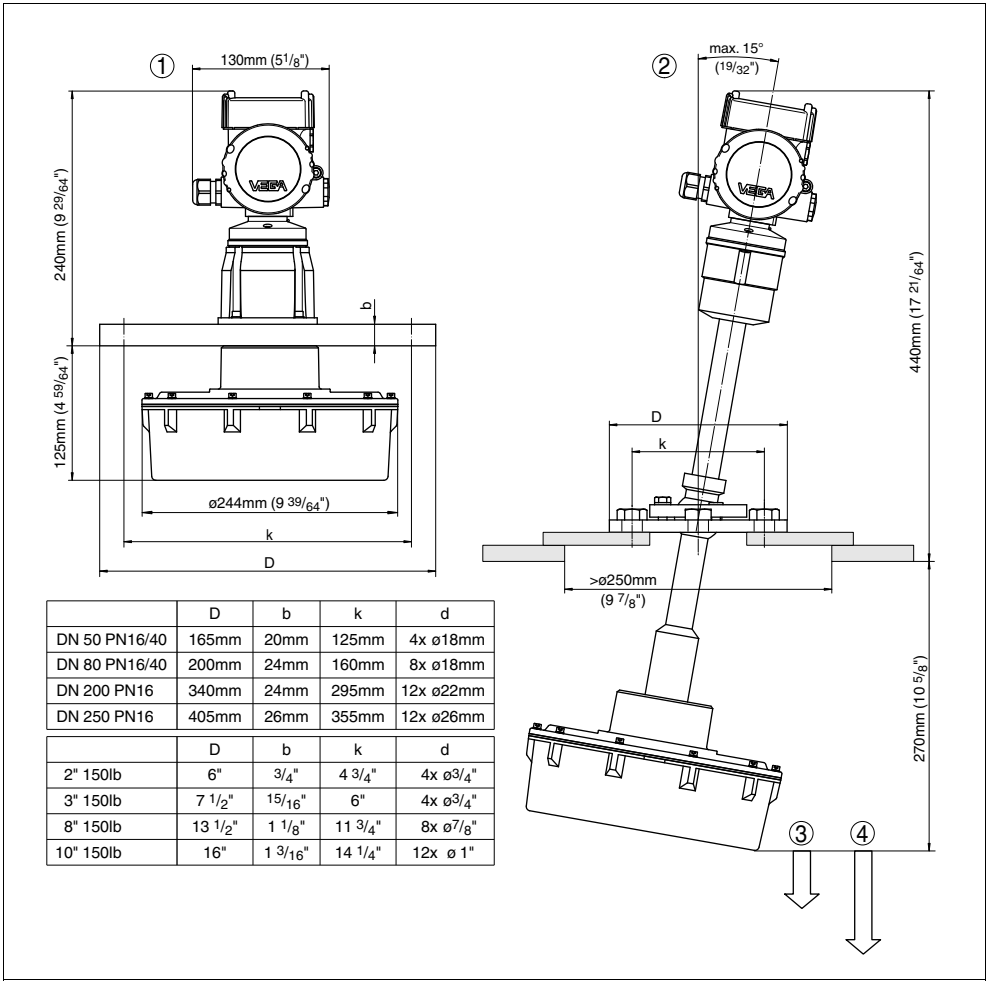


Fig. 36: Aluminium double chamber housing
** Dimension with integrated indicating and adjustment module*

VEGASON 65

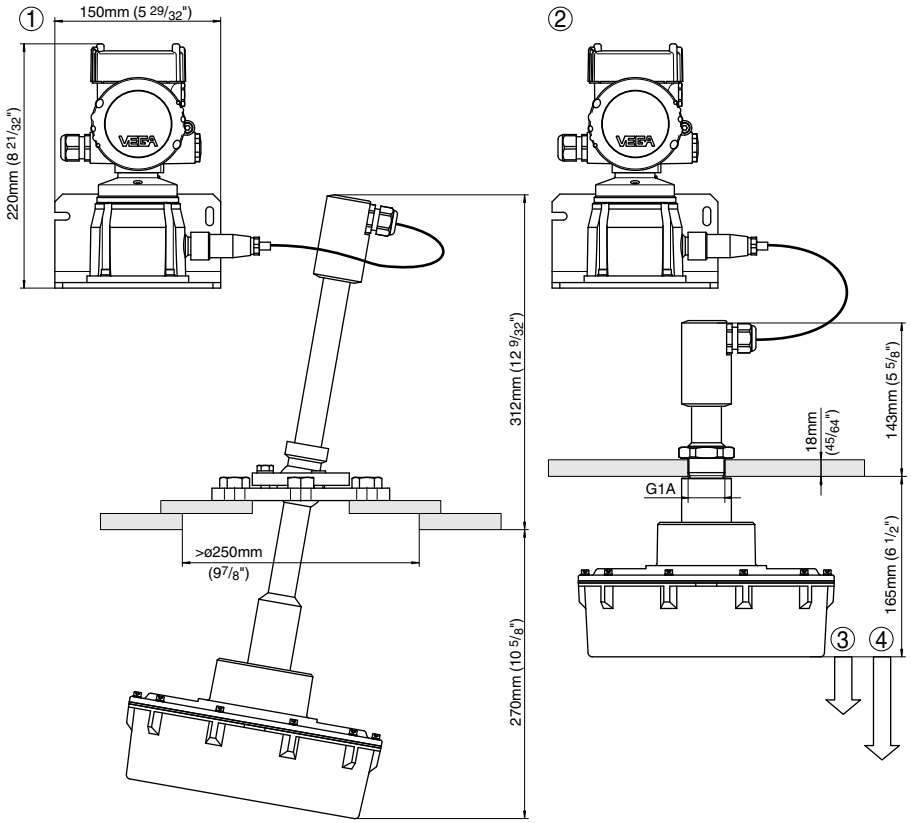


	D	b	k	d
DN 50 PN16/40	165mm	20mm	125mm	4x ø18mm
DN 80 PN16/40	200mm	24mm	160mm	8x ø18mm
DN 200 PN16	340mm	24mm	295mm	12x ø22mm
DN 250 PN16	405mm	26mm	355mm	12x ø26mm

	D	b	k	d
2" 150lb	6"	3/4"	4 3/4"	4x ø3/4"
3" 150lb	7 1/2"	15/16"	6"	4x ø3/4"
8" 150lb	13 1/2"	1 1/8"	11 3/4"	8x ø7/8"
10" 150lb	16"	1 3/16"	14 1/4"	12x ø 1"

Fig. 37: VEGASON 65
1 Version A
2 Version B
3 Dead zone: 1 m (3.3 ft)
4 Measuring range: with liquids up to 25 m (82 ft), with solids up to 15 m (49.2 ft)

VEGASON 65



	D	b	k	d
DN 50 PN16/40	165mm	20mm	125mm	4x ø18mm
DN 80 PN16/40	200mm	24mm	160mm	8x ø18mm
DN 200 PN16	340mm	24mm	295mm	12x ø22mm
DN 250 PN16	405mm	26mm	355mm	12x ø26mm

	D	b	k	d
2" 150lb	6"	3/4"	4 3/4"	4x ø3/4"
3" 150lb	7 1/2"	15/16"	6"	4x ø3/4"
8" 150lb	13 1/2"	1 1/8"	11 3/4"	8x ø7/8"
10" 150lb	16"	1 3/16"	14 1/4"	12x ø 1"

Fig. 38: VEGASON 65
1 Version C
2 Version D
3 Dead zone: 0.8 m (2.6 ft)
4 Measuring range: with liquids up to 45 m (147.6 ft), with solids up to 25 m (82 ft)

10.4 Industrial property rights

VEGA product lines are global protected by industrial property rights.
Further information see **http://www.vega.com**.
Only in U.S.A.: Further information see patent label at the sensor housing.

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