Operating Instructions

VEGAPULS 62 standpipe version
Foundation Fieldbus

Contents

1 About this document

1.1 Function 5
1.2 Target group 5
1.3 Symbolism used 5

2 For your safety

2.1 Authorised personnel 6
2.2 Appropriate use 6
2.3 Warning about misuse 6
2.4 CE conformity 6
2.5 Fulfilling NAMUR recommendations 7
2.6 FCC/IC conformity (only for USA/Canada) 7
2.7 Safety instructions for Ex areas 8
2.8 Manufacturer declaration 8
2.9 Functional range of approved instruments 9
2.10 Environmental instructions 9

3 Product description

3.1 Configuration 10
3.2 Principle of operation 11
3.3 Operation 13
3.4 Storage and transport 13

4 Mounting

4.1 General instructions 14
4.2 Mounting instructions 15

5 Connecting to voltage supply

5.1 Preparing the connection 17
5.2 Connection steps Instrument housing 18
5.3 Wiring plan, single chamber housing 19
5.4 Wiring plan, double chamber housing 21
5.5 Wiring plan, double chamber housing Exd 23
5.6 Wiring plan, version IP 66/IP 68, 1 bar 25
5.7 Switch-on phase 25

6 Setup with the indicating and adjustment module PLICSCOM

6.1 Short description 26
6.2 Insert the indicating and adjustment module . . . 26
6.3 Adjustment system 28
6.4 Setup procedure 29
6.5 Menu schematic 35

28740-EN-070130

6.6 Saving the parameter adjustment data 37

7 Setup with PACTware™ and other adjustment programs

7.1 Connecting the PC 38
7.2 Parameter adjustment with PACTware™ 38
7.3 Parameter adjustment with AMS™ 39
7.4 Saving the parameter adjustment data 39

8 Maintenance and fault rectification

8.1 Maintenance 40
8.2 Remove interferences 40
8.3 Exchange of the electronics module 42
8.4 Instrument repair 42

9 Dismounting

9.1 Dismounting steps 44
9.2 Disposal 44

10 Supplement

10.1 Technical data 45
10.2 Foundation Fieldbus 52
10.3 Dimensions 57
10.4 Industrial property rights 60
10.5 Trademark 60

Supplementary operating instructions manuals

Information:
VEGAPULS 62 is available in many versions and is thus 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 VEGAPULS 62, we offer accessories and replacement parts. The associated documents are:

- Operating instructions manual "*External indicating and adjustment unit VEGADIS 61*"
- Operating instructions manual "*Oscillator VEGAPULS series 60*"
- Supplementary instructions manual "*Flanges according to DIN-EN-ASME-JIS*"

28740-EN-070130

1 About this document

1.1 Function

This operating instructions manual has all the information you need for quick setup and safe operation. Please read this manual before you start setup.

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.

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. For safety and warranty reasons, any internal work on the instruments must be carried out only by personnel authorised by the manufacturer.

2.2 Appropriate use

VEGAPULS 62 is a sensor for continuous level measurement.

Detailed information on the application range of VEGAPULS 62 is available 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

VEGAPULS 62 is a high-tech instrument requiring the strict observance of standard regulations and guidelines. The emitting frequencies of all radar sensors are in the C or K-band range (depending on the instrument version). The low transmitting power is far below the internationally permitted limit values, and when the instrument is used correctly, no health-endangering effects are to be expected. There are no restrictions on using the instrument on the outside of metallic, closed vessels.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.

2.5 CE conformity

VEGAPULS 62 is in CE conformity with EMVG (89/336/EWG), R & TTE directive (1999/5/EC) and LVD (73/23/EWG).

Conformity has been judged according to the following standards:

- EMC: EN 61326: 2004

28740-EN-070130

- Emission: Class B
- Susceptibility: Industrial areas

- R & TTE directive: I-ETS 300-440 Expert opinion No. 0043052-02/SEE, Notified Body No. 0499
- LVD: EN 61010-1: 2002

2.6 Fulfilling NAMUR recommendations

With regard to interference resistance and interference emission, VEGAPULS 62 fulfils NAMUR recommendation NE 21.

VEGAPULS 62 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 VEGAPULS 62 HART, PA or FF
- DTM VEGAPULS 62 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 VEGAPULS 62 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 FCC/IC conformity (only for USA/Canada)

VEGAPULS with all antenna versions are FCC/IC approved.

Modifications not expressly approved by VEGA will lead to expiry of the operating licence according to FCC/IC.

VEGAPULS 62 is in conformity with part 15 of the FCC directives and fulfills the RSS-210 regulations. Note the corresponding regulations for operation:

- The instrument must not cause any interfering emissions

- The instrument must be insensitive to interfering emissions, also to such that may cause unwanted operating conditions.

The instrument is designed for operation with an antenna according to the "*Dimensions*" in the "*Supplement*" of this operating instructions manual, or without antenna, with a max. amplification of 33 dB. The instrument must not be operated with antennas not listed therein or those having an amplification of more than 33 dB. The required antenna impedance is 50 Ohm.

2.8 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.

2.9 Manufacturer declaration

In conformity with DIN EN 60079-14/2004, para. 5.2.3, point c1, VEGAPULS 62 is suitable for use in zone 2.

The operator must use the instrument as it was intended to be used and follow the specifications of the following documents:

- this operating instructions manual
- this manufacturer declaration (24636)
- the applicable installation regulations

Max. increase of the surface temperature during operation: 15 K (individual components in the instrument)

With an ambient temperature of 70 °C (158 °F) on the housing and a process temperature of 70 °C (158 °F), the max. ambient temperature during operation is 85 °C (185 °F).

Measures to maintain explosion protection during operation:

- Operate the instrument in the range of the specified electrical limit values. Permissible supply voltage: see "*Technical data*"
- Mount and operate the instrument in such a way that no danger of ignition from electrostatic charges is to be expected. The antenna, the process fitting or the housing (as the case may be depending on instrument version) are made of electrically non-conductive plastic.

- Make sure that the seal is mounted correctly between lower part of the housing and cover. Screw the cover on tightly.
- Make sure there is no explosive atmosphere present if you intend to operate the instrument with opened cover
- Make sure that the cable gland is tight and strain-relieved. The outer diameter of the connection cable must be adapted to the cable gland. Tighten the pressure screw of the cable gland carefully.
- Cover unused openings for cable glands tightly
- Mount the instrument in such a way that the sensor cannot touch the vessel wall or vessel installations. Keep in mind the influence of product movement in the vessel.
- The surface temperature of the housing must not exceed the ignition temperature of the surrounding explosive atmosphere

This instrument was assessed by a person who fulfils the DIN EN 60079-14 requirements.

2.10 Functional range of approved instruments

Instruments with national approvals such as according to FM or CSA are partly supplied with a previous hardware or software version. For approval-technical reasons, some functions for these instruments will be only available at a later date.

You will find corresponding instructions in the description of the individual functions in this operating instructions manual.

2.11 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 "*Storage and transport*"
- Chapter "*Disposal*"

3 Product description

3.1 Configuration

Scope of delivery

The scope of delivery encompasses:

- VEGAPULS 62 radar sensor
- Documentation
  - this operating instructions manual
  - Operating instructions manual "*Indicating and adjustment module PLICSCOM*" (optional)
  - Supplementary instructions manual "*Heating for indicating and adjustment module PLICSCOM*" (optional)
  - Supplementary instructions manual "*Plug connector for continuously measuring sensors*" (optional)
  - Ex-specific "*Safety instructions*" (with Ex-versions)
  - if necessary, further certificates

Components

VEGAPULS 62 consists of the following components:

- Process fitting with standpipe antenna
- Housing with electronics, optionally available with plug connector, optionally available with connection cable
- Housing cover, optionally available with indicating and adjustment module PLICSCOM

The components are available in different versions.

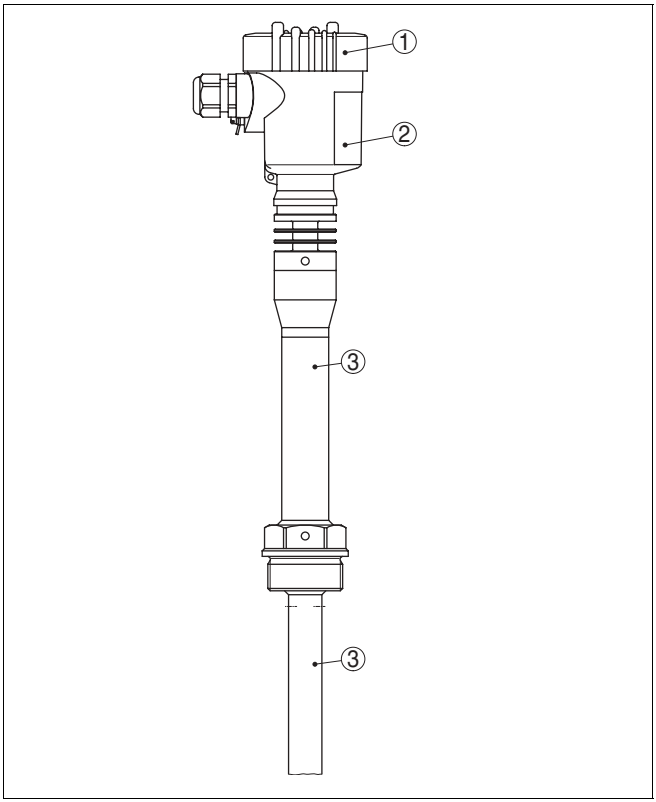


Fig. 1: VEGAPULS 62 in threaded version up to 200 °C (392 °F) with plastic housing
1 Housing cover with integrated PLICSCOM (optional)
2 Housing with electronics
3 Process fitting with standpipe antenna

3.2 Principle of operation

Area of application

VEGAPULS 62 is a radar sensor in K-band (emitting frequency approx. 26 GHz) for continuous level measurement.

A version of VEGAPULS 62 is available for each area of application.

The version with standpipe is particularly suitable for measurement of solvents and liquid gases in vessels with small process fittings under extremely difficult process conditions.

The standpipe antenna is also suitable for vessels with foam generation or for measurement of products with low dielectric values (DK > 1.6).

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

Functional principle

The antenna of the radar sensor emits short radar pulses with a duration of approx. 1 ns. These pulses are reflected by the product and received by the antenna as echoes. The running time of the radar pulses from emission to reception is proportional to the distance and hence to the level. The determined level is converted into an appropriate output signal and outputted as measured value.

Power supply and bus communication

Power is supplied via the H1 Fieldbus. A two-wire cable according to Fieldbus specification serves as carrier of both power and digital data signals 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 voltage 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".

The backlight of the indicating and adjustment module is powered by the sensor. Requirement is a certain height of the supply voltage.

The data for power supply are stated in chapter "*Technical data*" in the "*Supplement*".

For instruments with national approvals such as e.g. according to FM and CSA, this function only available at a later date.

The optional heating requires its own power supply. You can find further details in the supplementary instructions manual "*Heating for indicating and adjustment module*".

This function is generally not available for approved instruments.

28740-EN-070130

3.3 Operation

VEGAPULS 62 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 VEGAPULS 62, optionally also in the indicating and adjustment module or in PACTware™.

3.4 Storage and transport

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.

Storage and transport temperature

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

4 Mounting

4.1 General instructions

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°).

Screwing in

Warning:
The housing of the threaded versions must not be used to screw the instrument in! Applying tightening force on the housing can damage its rotational mechanical parts.

Moisture

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

You can give your VEGAPULS 62 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.

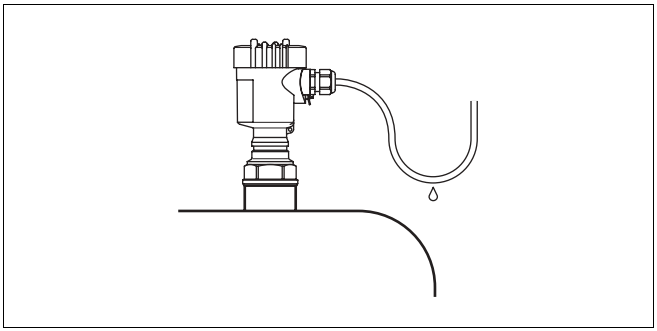


Fig. 2: Measures against moisture penetration

Measuring range

The reference plane for the measuring range is the lower edge of the flange or the seal surface of the thread. The measuring range extends from the vent hole in the standpipe below the reference plane up to the tube end.

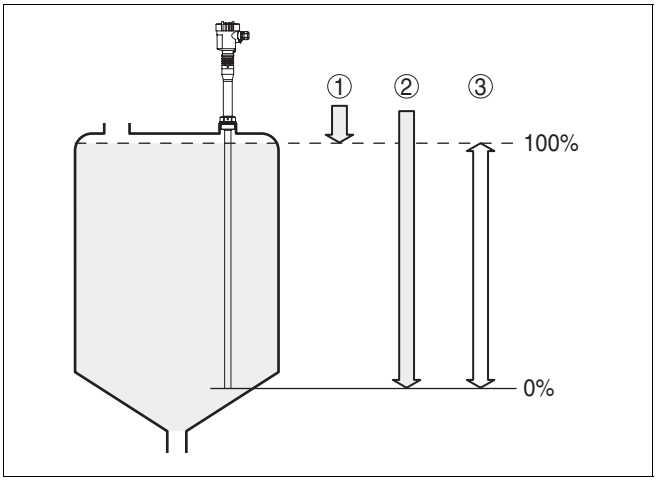


Fig. 3: Measuring range (operating range) and max. measuring distance
1 full
2 empty (max. measuring distance)
3 Measuring range

Materials, wetted parts

Make sure that the wetted parts of VEGAPULS 62, 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 will find specification in chapter "*Technical data*" in the "*Supplement*".

4.2 Mounting instructions

Mounting

By using the standpipe version, the influence of turbulence and vessel installations, such as e.g. heating spirals or agitators, is excluded. If turbulence or vigorous product movement occurs in the vessel, long standpipe antennas should be fastened to the vessel wall.

The standpipe antenna must extend all the way down to the requested min. level, as measurement is only possible within the tube. If good mixing of the product is important, you should use the version with perforated surge pipe.

Warning:
Remember that with the version with ¾" thread, a max. torque of 80 Nm (59 lbf ft) must not be exceeded.

Inflowing medium

Do not mount the instruments in or above the filling stream.

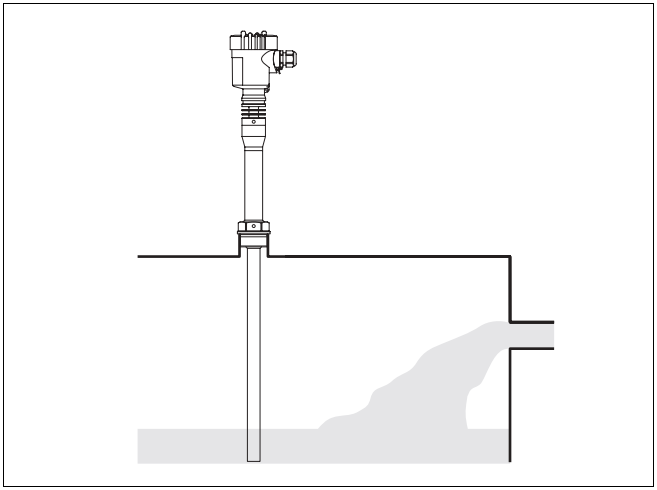


Fig. 4: Inflowing liquid

5 Connecting to voltage supply

5.1 Preparing the connection

Note safety instructions

Generally note the following safety instructions:

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

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

VEGAPULS 62 requires a supply voltage of 9 … 32 V DC. Power and the digital bus signal are carried on the same two-wire connection cable. Power is supplied via the H1 power supply.

Selecting connection cable

VEGAPULS 62 is connected with screened cable according to Fieldbus specification. A cable diameter of 5 … 9 mm ensures the seal effect of the cable gland.

Make sure that the entire installation is carried out according to the Fieldbus specification. In particular, make sure that the termination of the bus is done with appropriate terminating resistors.

Cable gland ½ NPT

On VEGAPULS 62 with cable gland ½ NPT and plastic housing, a metal ½" threaded insert is moulded in the plastic housing.

Caution:
No grease should be used when screwing the NPT cable gland or steel tube into the threaded insert. Standard grease can contain additives affecting the connection between threaded insert and housing. This will influence the stability of the connection and the tightness of the housing.

Cable screening and grounding

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

In systems without potential equalisation, connect the cable screen directly to ground potential at the power supply unit and at the sensor. In the connection box or T-distributor, the screen of the short stub to the sensor must not be connected to ground potential or to another cable screen. The cable screens to the power supply unit and to the next distributor must be connected to each other and also connected to ground potential 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.

The total capacitance of the cable and of all capacitors must not exceed 10 nF in Ex applications.

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 steps Instrument housing

Proceed as follows:

1 Unscrew the housing cover

2 If an indicating and adjustment module is installed, remove it by turning it slightly to the left.

3 Loosen compression nut of the cable entry

4 Remove approx. 10 cm (4 in) of the cable mantle, strip approx. 1 cm (0.4 in) insulation from the ends of the individual wires

5 Insert the cable into the sensor through the cable entry

6 Lift the opening levers of the terminals with a screwdriver (see following illustration)

7 Insert the wire ends into the open terminals according to the wiring plan

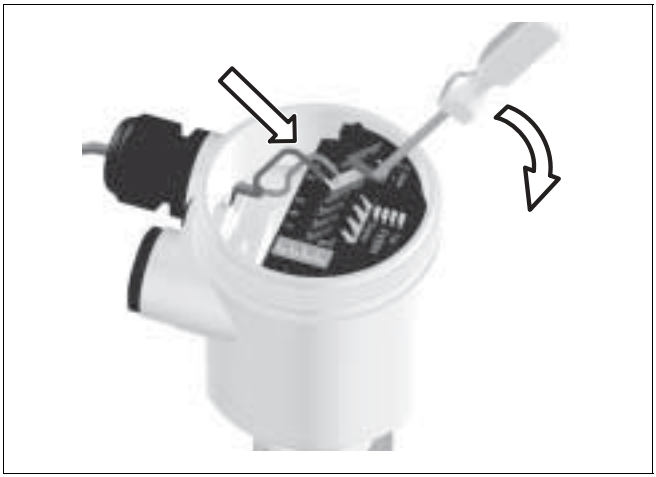


Fig. 5: Connection steps 6 and 7

8 Press down the opening levers of the terminals, you will hear the terminal spring closing

9 Check the hold of the wires in the terminals by lightly pulling on them

10 Connect the screen to the internal ground terminal and the external ground terminal to potential equalisation

11 Tighten the compression nut of the cable entry. The seal ring must completely encircle the cable

12 Screw the housing cover back on

The electrical connection is finished.

5.3 Wiring plan, single chamber housing

The following illustrations apply to the non-Ex as well as to the Ex ia version.

Housing overview

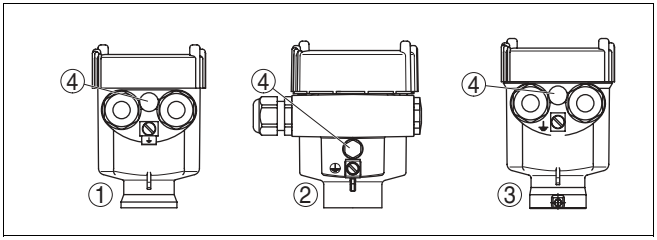


Fig. 6: Material versions, single chamber housing
1 Plastic
2 Aluminium
3 Stainless steel
4 Filter element for air pressure compensation of all material versions. Blind stopper with version IP 66/IP 68, 1 bar for Aluminium and stainless steel

Electronics and connection compartment

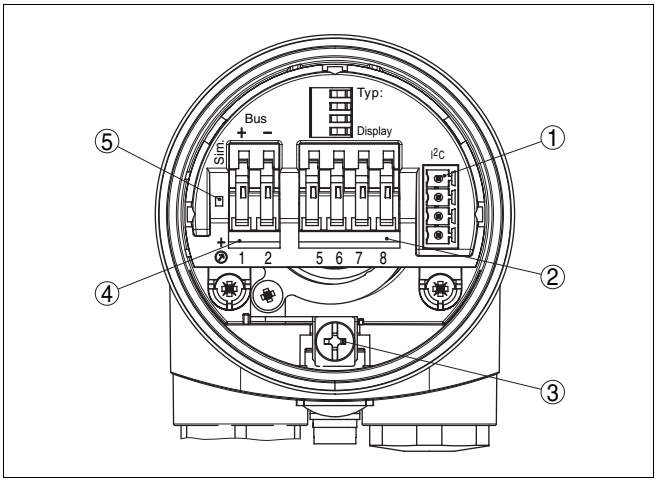


Fig. 7: Electronics and connection compartment, single chamber housing
1 Plug connector for VEGACONNECT (I^2C interface)
2 Spring-loaded terminals for connection of the external indication VEGADIS 61
3 Ground terminal for connection of the cable screen
4 Spring-loaded terminals for Foundation Fieldbus connection
5 Simulation switch ("on" = mode for simulation release)

Wiring plan

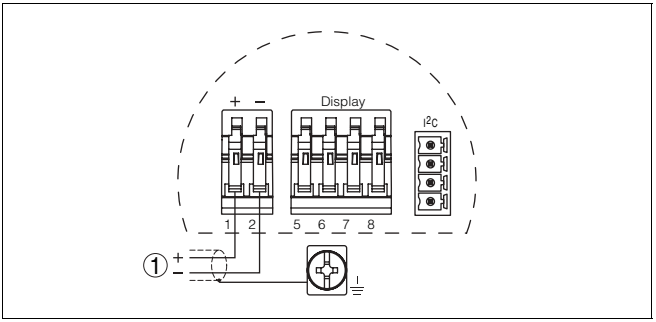


Fig. 8: Wiring plan, single chamber housing
1 Power supply/Signal output

5.4 Wiring plan, double chamber housing

The following illustrations apply to the non-Ex as well as to the Ex ia version.

Housing overview

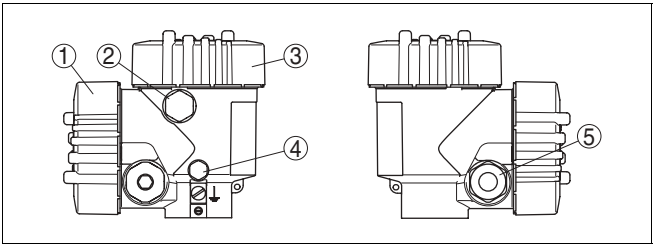


Fig. 9: Double chamber housing
1 Housing cover, connection compartment
2 Blind stopper or plug M12x1 for VEGADIS 61 (option)
3 Housing cover, electronics compartment
4 Filter element for pressure compensation or blind stopper with version IP 66/ IP 68, 1 bar[1)]
5 Cable entry or plug

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

Electronics compartment

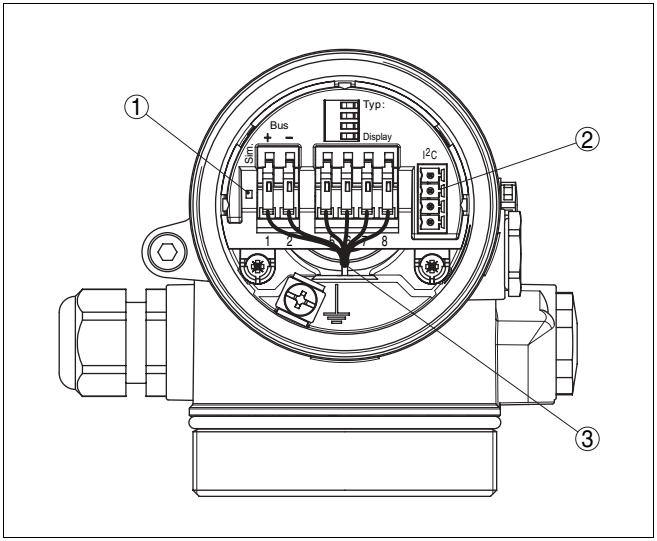


Fig. 10: Electronics compartment, double chamber housing
1 Simulation switch ("on" = mode for simulation release)
2 Connection for VEGACONNECT (I²C interface)
3 Internal connection cable to the connection compartment

Connection compartment

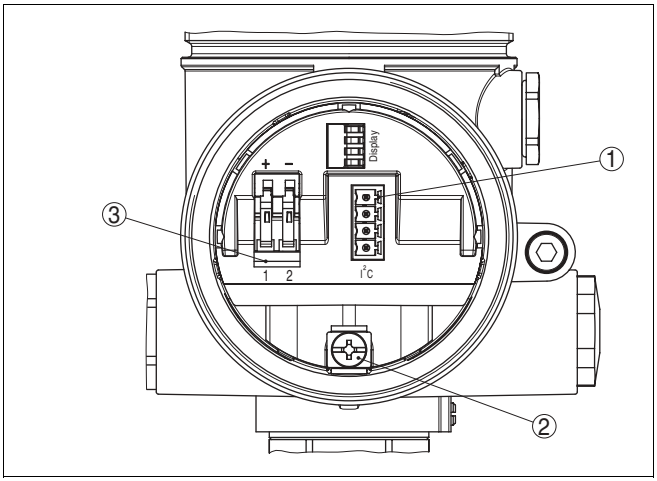


Fig. 11: Connection compartment, double chamber housing
1 Plug connector for VEGACONNECT (I²C interface)
2 Ground terminal for connection of the cable screen
3 Spring-loaded terminals for voltage supply

Wiring plan

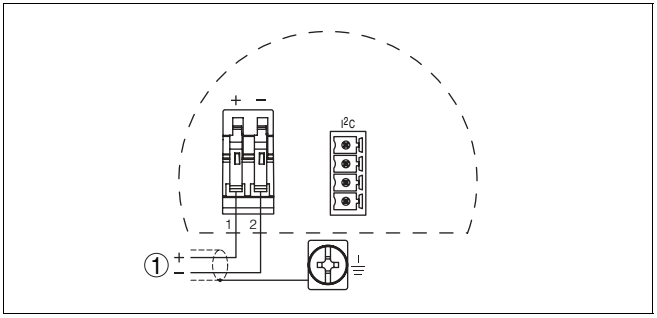


Fig. 12: Wiring plan, double chamber housing
1 Power supply/Signal output

5.5 Wiring plan, double chamber housing Exd

Information:
Instruments in Exd version with hardware revision …- 01 or higher as well as with national approvals such as e.g. according to FM or CSA at a later date.

Housing overview

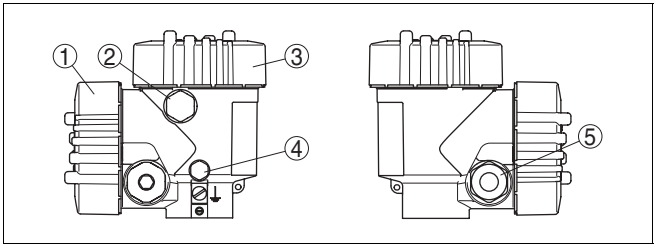


Fig. 13: Double chamber housing
1 Housing cover, connection compartment
2 Blind stopper or plug M12x1 for VEGADIS 61 (option)
3 Housing cover, electronics compartment
4 Filter element for pressure compensation or blind stopper with version IP 66/ IP 68, 1 bar[2)]
5 Cable entry or plug

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

Electronics compartment

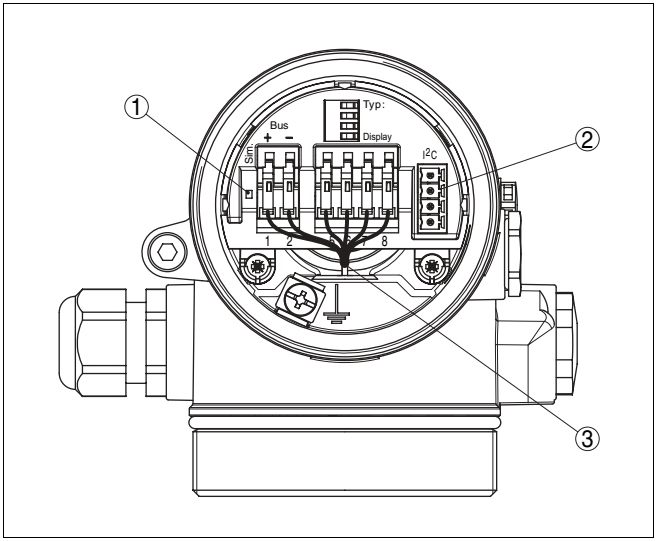


Fig. 14: Electronics compartment, double chamber housing
1 Simulation switch ("on" = mode for simulation release)
2 Connection for VEGACONNECT (I^2C interface)
3 Internal connection cable to the connection compartment

Connection compartment

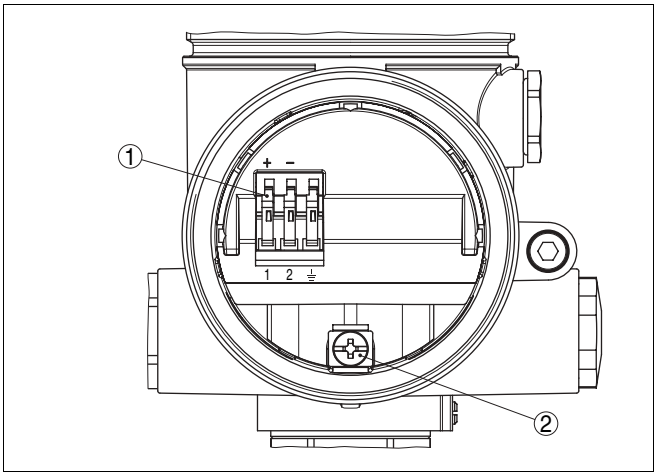


Fig. 15: Connection compartment, double chamber housing Exd
1 Spring-loaded terminals for power supply and cable screen
2 Ground terminal for connection of the cable screen

Wiring plan

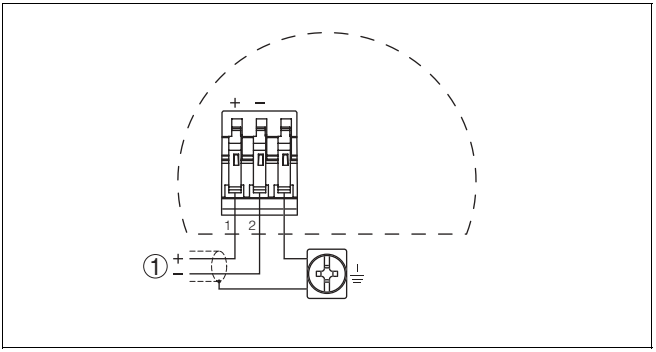


Fig. 16: Wiring plan, double chamber housing Exd
1 Power supply/Signal output

5.6 Wiring plan, version IP 66/IP 68, 1 bar

Wire assignment, connection cable

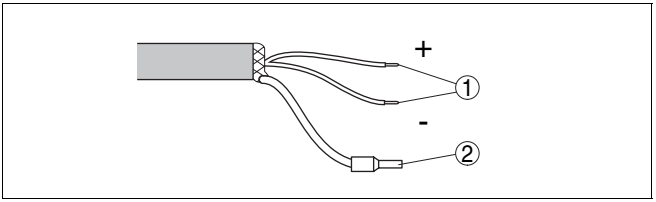


Fig. 17: Wire assignment, connection cable
1 brown (+) and blue (-) to power supply or to the processing system
2 Screen

5.7 Switch-on phase

Switch-on phase

After VEGAPULS 62 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.[3)]

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

6 Setup with the indicating and adjustment module PLICSCOM

6.1 Short description

Function/Configuration

The indicating and adjustment module 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

From a hardware revision …- 01 or higher of PLICSCOM as well as a hardware revision …- 01, 03 or higher of the corresponding sensor, an integrated backlight can be switched via the adjustment menu. The hardware revision is stated on the type label of the PLICSCOM or the sensor electronics.

Information:
This function is for instruments with StEx, WHG or ship approval as well as country-specific approvals such as those according to FM or CSA, available at a later date.

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

6.2 Insert the indicating and adjustment module

Mounting/dismounting the 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/adjustment module is powered by the sensor, an additional connection is not necessary.

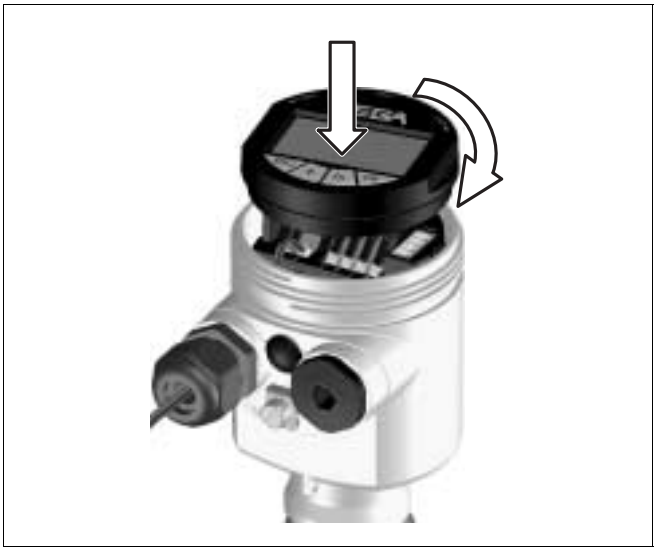


Fig. 18: Installation of the indicating and adjustment module

Note:
If you intend to retrofit VEGAPULS 62 with an indicating and adjustment module for continuous measured value indication, a higher cover with an inspection glass is required.

6.3 Adjustment system

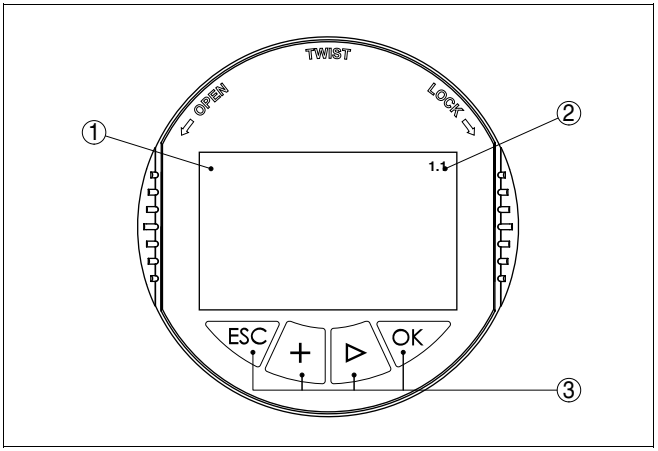


Fig. 19: Indicating and adjustment elements
1 LC display
2 Indication of the menu item number
3 Adjustment keys

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 VEGAPULS 62 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.[4)]

Parameter adjustment

As VEGAPULS 62 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 seal surface of the thread or flange. With these settings, the real level is calculated. Furthermore the operating range of the sensor is limited from maximum to the required 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.

Caution:
If there is a separation of liquids with different dielectric values in the vessel, e.g. by condensation, VEGAPULS 62 can detect under certain circumstances only the medium with the higher dielectric value.

Keep in mind that interfaces can cause faulty measurements.

If you want to measure the total height of both liquids reliably, please contact our service department or use an instrument specially designed for interface measurement.

4)
4) The values correspond to the actual measured level as well as to the settings already carried out, e.g. default setting.

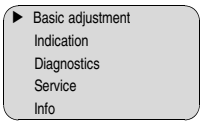
In the main menu item "*Basic adjustment*", the individual submenu items should be selected one after the other and provided with the correct parameter values.

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

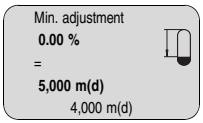
Carrying out min. adjustment

Proceed as follows:

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



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



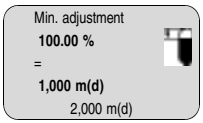
3 Prepare the % value for editing with ***[OK]*** and set the cursor to the requested position with ***[->]***. Set the requested percentage value with ***[+]*** and save with ***[OK]***. The cursor jumps now to the distance value.

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.

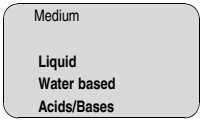
3 Save the settings with ***[OK]*** and move to "Medium selection" with ***[->]***.

Medium selection

Each product has different reflective properties.

According to the conductivity and the dielectric value of liquids, the reflection properties can differ considerably. Therefore additional options such as "*Solvent*", "*Chem. mixture*" and "*Water based*" are offered below the menu item Liquid.

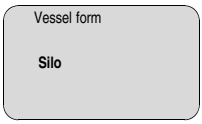
Through this additional selection, the sensor is adapted perfectly to the product and measurement reliability, particularly in products with bad reflective properties, is considerably increased.



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 "*Solid*" these are "*Silo*" or "*Bunker*", with "*Liquid*", "*Storage tank*", "*Stilling tube*", "*Open vessel*" or "*Stirred vessel*".

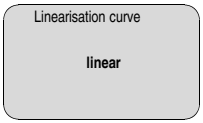


Enter the requested parameter via the appropriate keys, save your settings and jump to the next menu item with the ***[->]*** key.

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

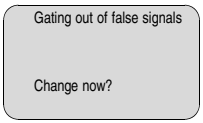
the vessel is displayed correctly. If the volume should not be displayed in percent but e.g. in l or kg, a scaling can be also set in the menu item "*Display*".



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]***.

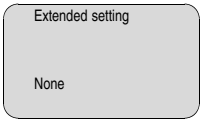
2 Select the menu item "*Service*" with ***[->]*** and confirm with ***[OK]***. Now the menu item "*False signal suppression*" is displayed.

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.

Extended setting/Quick level change

The menu item "*Extended setting*" offers the possibility to optimise VEGAPULS 62 for applications in which the level changes very quickly. For this reason, select the function "*Quick level change >1m/min.*".



Note:
Because the average value generation of the signal processing is clearly reduced with the function "*Quick level change >1m/min.*", false reflections caused by agitators or vessel installations can cause measured value fluctuations. A false echo storage is recommended.

Copy sensor data

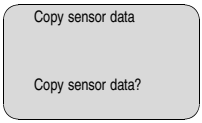
This function enables reading out parameter adjustment data as well as writing parameter adjustment data into the sensor via the indicating and adjustment module. A description of the function is available in the operating instructions manual "*Indicating and adjustment module*".

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

- Measured value presentation
- Adjustment
- Medium
- Standpipe inner diameter[5)]
- 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



[5)] With standpipe versions.

Reset

Basic adjustment

If the "*Reset*" is carried out, the sensor resets the values of the following functions to the reset values (see chart):[6)]

Function	Reset value
Min. adjustment	0 m(d)
Min. adjustment	30 m(d) (VEGAPULS 61, 63, 65) 35 m(d) (VEGAPULS 62, 66) 70 m(d) (VEGAPULS 68)
Medium	Liquid
Vessel form	not known
Damping	0 s
Linearization	linear
Sensor-TAG	Sensor
Displayed value	AI-Out
Extended settings	Keine
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.[7)]

Pointer

The min. and max. distance 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*".

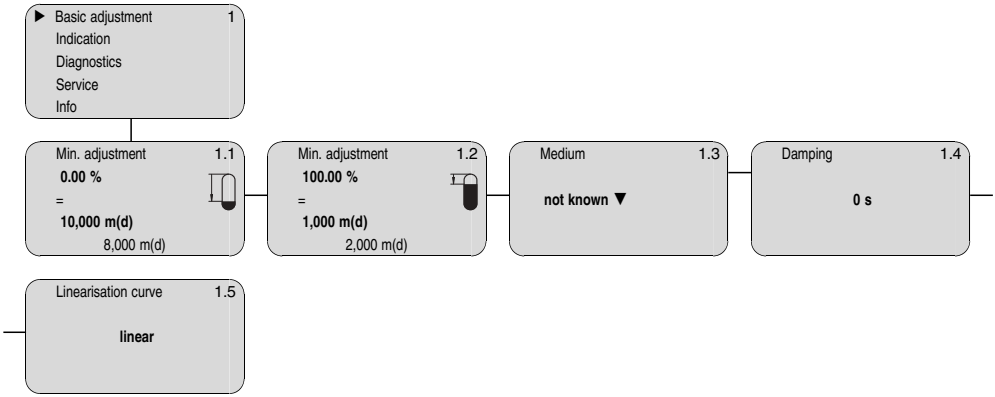
6) Sensor-specific basic adjustment.

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

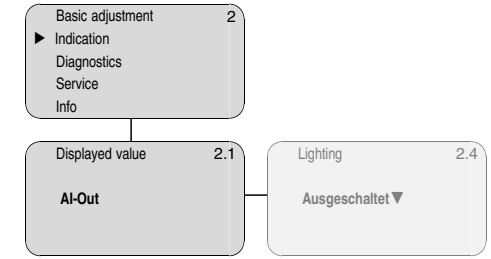
6.5 Menu schematic

Information:
Depending on the version and application, the highlighted menu windows are not always available.

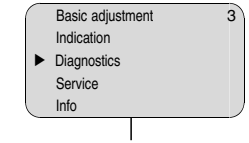
Basic adjustment

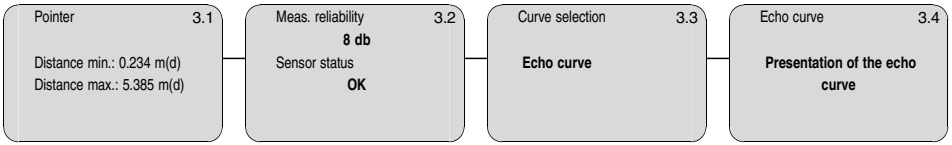


Indication

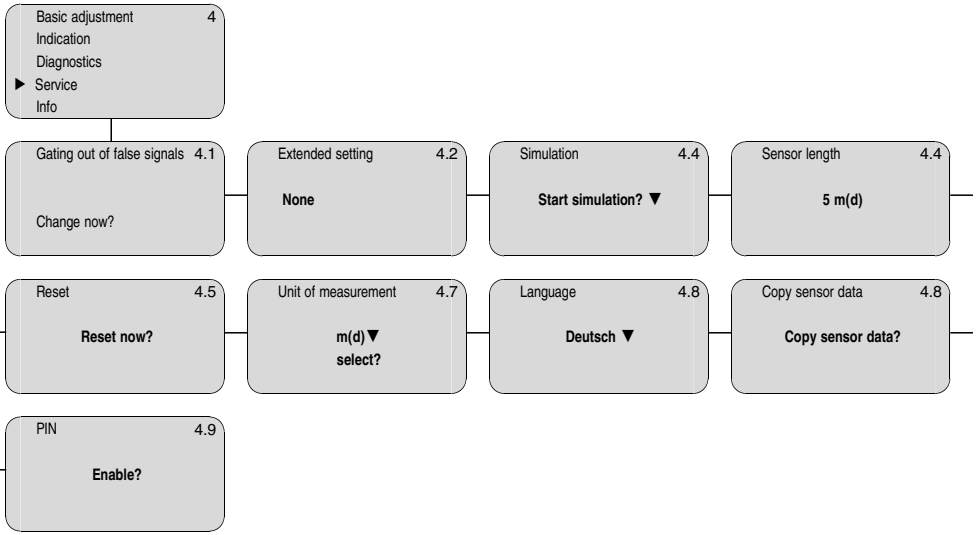


Diagnostics

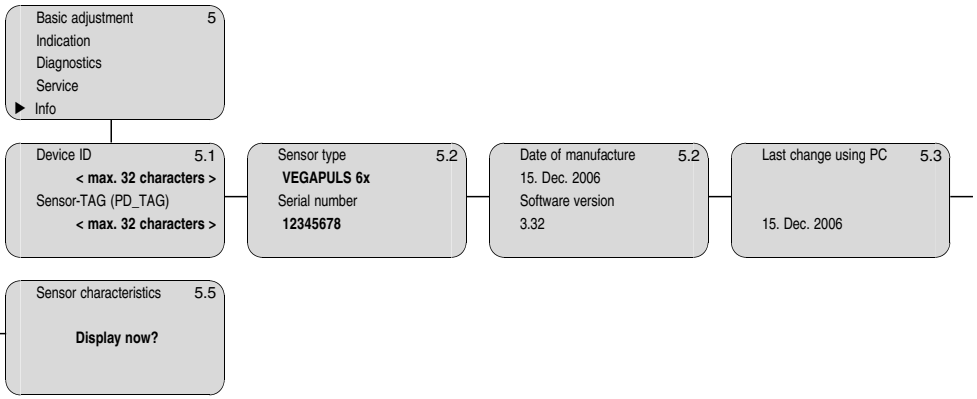




Service



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 VEGAPULS 62 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 VEGAPULS 62, 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 Connecting the PC

Connecting the PC directly to the sensor

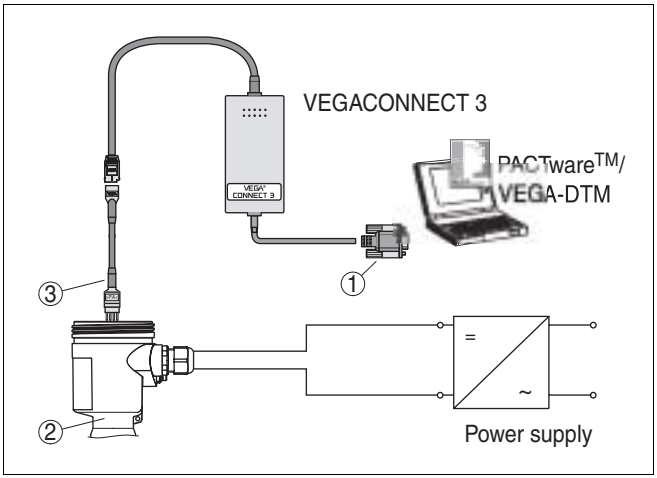


Fig. 20: Connection directly to the sensor
1 RS232 connection
2 VEGAPULS 62
3 I²C adapter cable for VEGACONNECT 3

Necessary components:

- VEGAPULS 62
- PC with PACTware™ and suitable VEGA DTM
- VEGACONNECT 3 with I²C adapter cable (article no. 2.27323)
- Power supply unit

7.2 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 VEGAPULS 62, DTM-Collection 06/2003 or a newer 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*".

7.3 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*".

7.4 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, VEGAPULS 62 is completely maintenance free.

8.2 Remove interferences

Causes of malfunction

VEGAPULS 62 offers maximum reliability. Nevertheless faults can occur during operation. These may be caused by the following, e.g.:

- Sensor
- Process
- Supply
- Signal processing

Fault rectification

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 this 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, E042, E043

- 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 an electronics module with appropriate 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 or on the delivery note.

Information:
When loading on site, 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 in their signal output or in their power supply. You can find a suitable oscillator in the following overview.

Foundation Fieldbus

Oscillator PS-E.60**KF.** suitable for **K** band VEGAPULS 61, 62, 63 - Foundation Fieldbus. The following versions are available which differ in the approvals:

- PS-E.60KF**X** (X = without approvals)
- PS-E.60KF**D** (D = approvals CI, UX, UF 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) in the Internet from 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 filled in form and if necessary, a safety data sheet to the instrument
- Please ask the agency serving you for the address of your return shipment. You find the respective agency on our website www.vega.com under: "*Company - VEGA worldwide*"

9 Dismounting

9.1 Dismounting steps

Warning:
Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel, high temperatures, corrosive or toxic products etc.

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 electronic modules 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 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 "*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

316L corresponds to 1.4404 or 1.4435

Materials, wetted parts	
– Process fitting	316L, Hastelloy C22, Hastelloy C22 plated
– Seal, process fitting threaded version	Klingersil C-4400
– Antenna cone	PTFE (TFM 1600 PTFE), PP
– seal, antenna system	FKM (Viton), Kalrez 2035, 6230 (FDA), 6375
– Standpipe	316L, Hastelloy C22
Materials, non-wetted parts	
– Housing	Plastic PBT (Polyester), Alu die-casting powder-coated, 316L
– Seal ring between housing and housing cover	NBR (stainless steel housing), silicone (Alu/plastic housing)
– Inspection window in housing cover for PLICSCOM	Polycarbonate (UL-746-C listed)
– Ground terminal	316Ti/316L
Weight	
– Process fitting - thread	2 … 2.8 kg (4.4 … 6.2 lbs), depending on thread size and housing material
– Process fitting - flange	4.2 … 15.4 kg (9.3 … 34 lbs), depending on flange size and housing material
– Standpipe	1.6 kg/m (1.1 lbs/ft)
Length standpipe	up to 5.85 m

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
– Channel 3	Secondary value 2

Transmission rate	31,25 Kbit/s
Current value	10 mA, ±0.5 mA

Input variable

Parameter	Distance between process fitting (seal surface hexagon or lower edge of flange) of the sensor and product surface
Min. distance	0 mm
Measuring range	up to 5.85 m[8)]

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	idealer Reflektor, z. B. Metallplatte 2x2m
– False reflections	größtes Störecho 20 dB kleiner als Nutzecho

Characteristics and performance data

Frequency	K-band (26 GHz technology)
Interval	approx. 1 s
Step response or adjustment time[9)]	>1 s (dependent on the parameter adjustment)
Max. level change	adjustable up to 1 m/min. (dependent on the parameter adjustment)

Received average emitted power reaching an object directly in front of the antenna

– Received average emitted power reaching an object directly in front of the antenna

Distance 1 m (3.28 ft)108 nW per cm^2 (108^{-9} W/cm^2) or 108 nW per 0.155 in^2 ($108x10^{-9}$ W/ 0.155 in^2)Distance 5 m (16.404 ft)4.3 nW per cm^2 (4.3^{-9} W/cm^2) or 4.3 nW per 0.155 in^2 ($4.3x10^{-9}$ W/0.155 in^2)

8) According to the respective standpipe length.

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

Measuring accuracy

Resolution, general	max. 1 mm (max. 0.039 in)
Deviation[10)]	see diagram

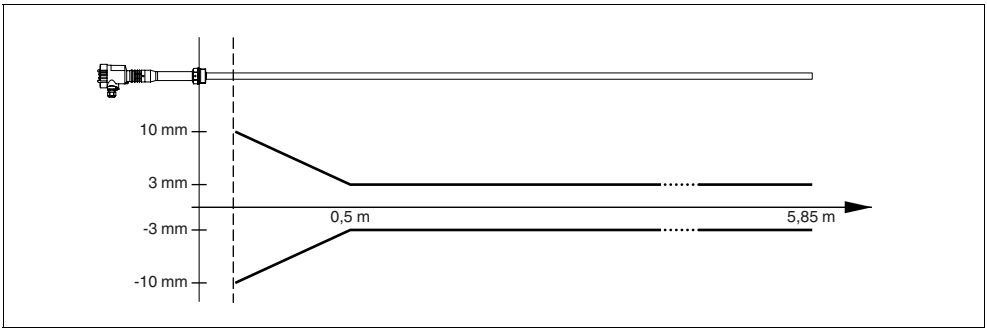


Fig. 21: Accuracy VEGAPULS 62 in mm, measuring range in m

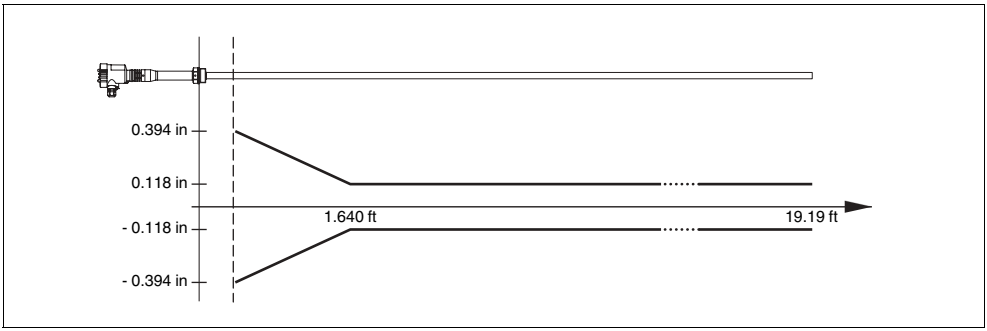


Fig. 22: Accuracy VEGAPULS 62 in Inch, measuring range in ft

Influence of the ambient temperature to the sensor electronics[11)]

Average temperature coefficient of the zero signal (temperature error)	0.03 %/10 K

[10)] Incl. non-linearity, hysteresis and non-repeatability.

[11)] Relating to the nominal measuring range.

Influence of superimposed gas and pressure to the accuracy

The spreading speed of radar impulses in gas or vapour above the measured product is reduced by high pressures. This effect depends on the superimposed gas or vapour and is very high in case of low temperatures. The following chart shows the resulting deviation for some typical gases or vapours. The stated values relate to the distance. Positive values mean that the measured distance is too high, negative values that the measured distance is too small.

Gas phase	Temperature	1 bar/14.5 psi	10 bar/145 psi	50 bar/725 psi
Air/Nitrogen	20 °C/68 °F	0.00 %	0.22 %	1.2 %
Air/Nitrogen	200 °C/392 °F	0.00 %	0.13 %	0.74 %
Hydrogen	20 °C/68 °F	-0.01 %	0.10 %	0.61 %
Hydrogen	200 °C/392 °F	-0.02 %	0.05 %	0.37 %
Water (saturated steam)	100 °C/212 °F	0.20 %	-	-
Water (saturated steam)	180 °C/356 °F	-	2.1 %	-

Ambient conditions

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

Process conditions

Process temperature (measured on the process fitting), depending on the seal of the antenna system

- FKM (Viton): -40 … +130 °C (-40 … +266 °F)
- FKM (Viton) with temperature adapter: -40 … +200 °C (-40 … +392 °F)
- Kalrez 2035, 6230 (FDA), 6623: -15 … +130 °C (+5 … +266 °F)
- Kalrez 2035, 6230 (FDA) with temperature adapter: -15 … +200 °C (+5 … +392 °F)
- Kalrez 6375: -20 … +130 °C (-4 … +266 °F)
- Kalrez 6375 with temperature adapter: -20 … +200 °C (-4 … +392 °F)

For the vessel pressure, you also have to note the specifications on the type label. Always the lowest value is applicable.

Vessel pressure: -100 … 4000 kPa/-1 … 40 bar (-14.5 … 580 psi)

Vessel pressure relating to the flange nominal stage	see supplementary instructions manual "*Flanges according to DIN-EN-ASME-JIS*"
Vibration resistance	mechanical vibrations with 1 g and 5 … 100 Hz[12)]

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

Cable entry/plug[13)]

– Single chamber housing
- 1x cable entry M20x1.5 (cable-ø 5 … 9 mm), 1x blind stopper M20x1.5

or:
- 1x cloasing cap M20x1.5, 1x blind stopper M20x1.5

or:
- 1x closing cap ½ NPT, 1x blind plug ½ NPT

or:
- 1x plug (depending on the version), 1x blind plug M20x1.5

– Double chamber housing
- 1x cable entry M20x1.5 (cable-ø 5 … 9 mm); 1x blind stopper M20x1.5; 1x blind stopper M16x1.5 or optionally 1x plug M12x1 for VEGADIS 61

or:
- 1x closing cap ½ NPT, 1x blind stopper ½ NPT, 1x blind stopper M16x1.5 or optionally 1x plug M12x1 for VEGADIS 61

or:
- 1x plug (depending on the version); 1x blind stopper M20x1.5; 1x blind stopper M16x1.5 or optionally 1x plug M12x1 for VEGADIS 61

Spring-loaded terminals: for wire cross-section up to 2.5 mm²

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

Cable entry

– Single chamber housing	1x IP 68 cable entry M20x1.5; 1x blind stopper M20x1.5
– Double chamber housing	1x IP 68 cable gland M20x1.5; 1x blind stopper M20x1.5; 1x blind stopper M16x1.5

12) Tested according to the regulations of German Lloyd, GL directive 2

13) Depending on the version M12x1, according to DIN 43650, Harting, Amphenol-Tuchel, 7/8" FF.

Connection cable	
– Wire cross-section	0.5 mm^2
– wire resistance	<0.036 Ohm/m
– Tensile strength	>1200 N (270 lbf)
– Standard length	5 m (16.4 ft)
– Max. length	1000 m (3280 ft)
– Min. bending radius	25 mm (1 in) at 25 °C (77 °F)
– Diameter	approx. 8 mm
– Colour - standard PE	Black
– Colour - standard PUR	Blue
– Colour - Ex-version	Blue

Indicating and adjustment module

Power supply and data transmission	through sensor via gold-plated sliding contacts (I^2C bus)
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 instrument	9 … 32 V DC
EEx ia instrument	9 … 24 V DC
Supply 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
– Alu and stainless steel standard	IP 66/IP 68 (0.2 bar)[14]
– Alu and stainless housing (optionally available)	IP 66/IP 68 (1 bar)
Overvoltage category	III
Protection class	II

Approvals[15][16]

ATEX ia	ATEX II 1G, 1/2G, 2G EEx ia IIC T6; ATEX II 1G, 1/2G, 2G EEx ia IIC T5+ATEX II 1/2D IP6X T6
ATEX D	ATEX II 1/2 D IP6X T
ATEX ia + D	ATEX II 1G, 1/2G, 2G EEx ia IIC T5+ATEX II 1/2D IP6X T6
ATEX d	ATEX II 1/2G, 2G EExd ia IIC T6
ATEX d + D	ATEX II 1/2G, 2G EExd ia IIC T5+ATEX II 1/2D IP6X T6
IEC ia	IEC Ex ia IIC T6
IEC d	IEC Exd ia IIC T6
IEC Ex	Ex tD A20/A21 IP66 T, A21
FM	FM Cl.I, Div2 (NI)+Cl.II, III, Div1 (DIP); FM Cl.I-III, Div 1 (IS); FM Cl.I-III, Div 1(IS)+Cl.I-III, Div 1 Gr.C-G (XP)
CSA	CSA Cl.I, Div2 (NI)+Cl.II, III, Div1 (DIP); CSA Cl.I-III, Div 1 (IS); CSA Cl.I-III, Div 1(IS)+Cl.I-III, Div 1 Gr.C-G (XP)
Ship approvals	GL, LRS, ABS, CCS, RINA
Others	WHG

14) Prerequisite for maintaining the protection is a suitable cable.

15) Deviating data in Ex applications: see separate safety instructions.

16) Depending on order specification.

10.2 Foundation Fieldbus

Block diagram, measured value processing

The following illustration shows the Transducer Block and Function block in simplified form.

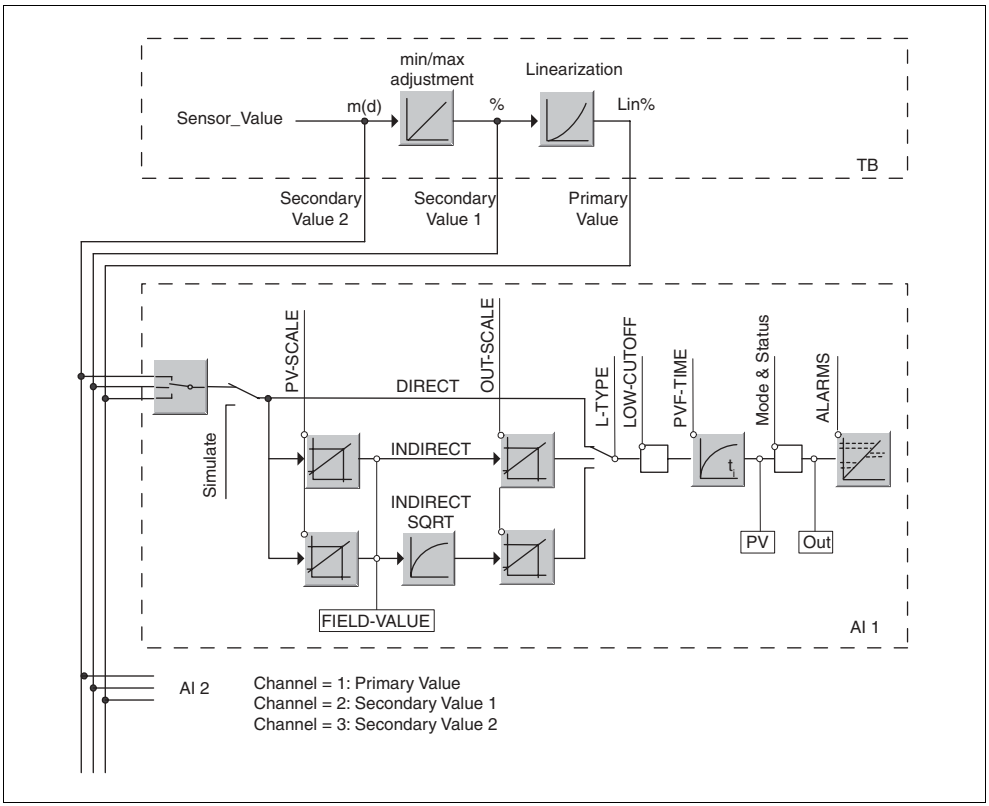


Fig. 23: VEGAPULS 62 measured value processing

Diagram, adjustment

The following illustration shows the function of the adjustment.

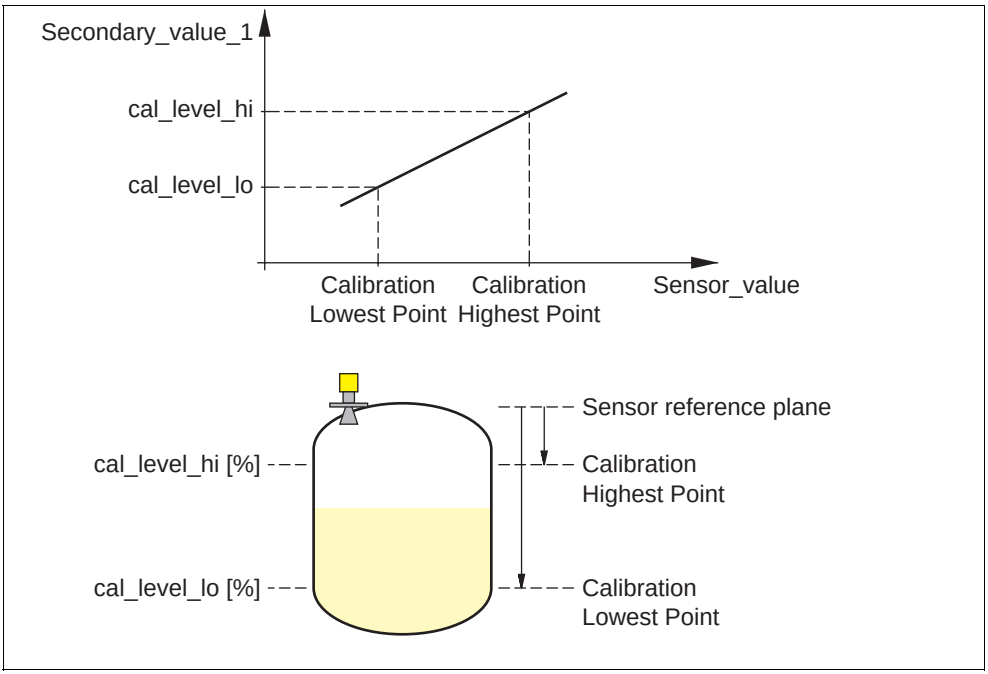


Fig. 24: Adjustment VEGAPULS 62

Parameter list

The following list contains the most important parameters and their meaning:

- primary_value
  - Process value after min/max-adjustment and linearization. Selected as input to AIFB by setting 'Channel' = 1. Unit derives from 'Primary_value_unit'
- primary_value_unit
  - Selected unit code for "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
  - Selected unit code for "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 indication and adjustment 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'
- Calibration Highest Point
  - Min./max.-adjustment: Upper calibrated point of the sensor. It refers to 'Cal_level_hi'. The unit is defined in 'Sensor_range.unit'
- Calibration Lowest Point
  - 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
- tube diameter
  - Set up to suit the process conditions

10.3 Dimensions

Housing in protection IP 66/IP67 and IP 66/IP 68; 0.2 bar

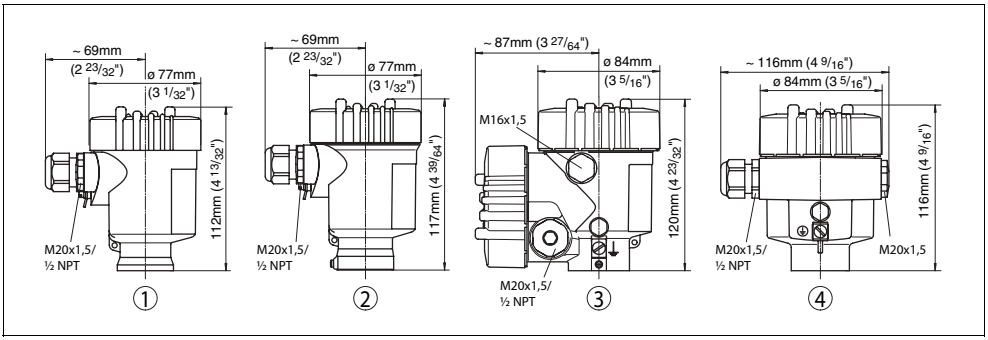


Fig. 25: Housing versions in protection IP 66/IP 67 and IP 66/IP 68, 0.2 bar (with integrated PLICSCOM the housing is 9 mm/0.35 in higher)
1 Plastic housing
2 Stainless steel housing
3 Aluminium double chamber housing
4 Aluminium housing

Housing in protection IP 66/IP 68, 1 bar

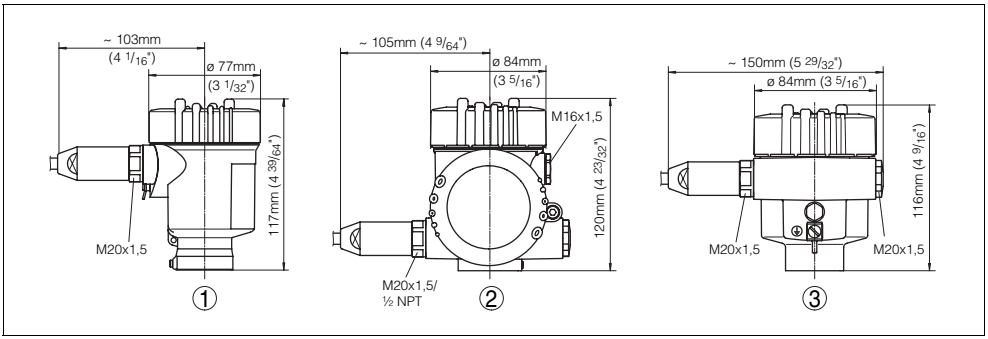


Fig. 26: Housing versions in protection IP 66/IP 68, 1 bar (with integrated PLICSCOM the housing is 9 mm/0.35 in higher)
1 Stainless steel housing
2 Aluminium double chamber housing
3 Aluminium housing

VEGAPULS 62 - Standpipe version with thread

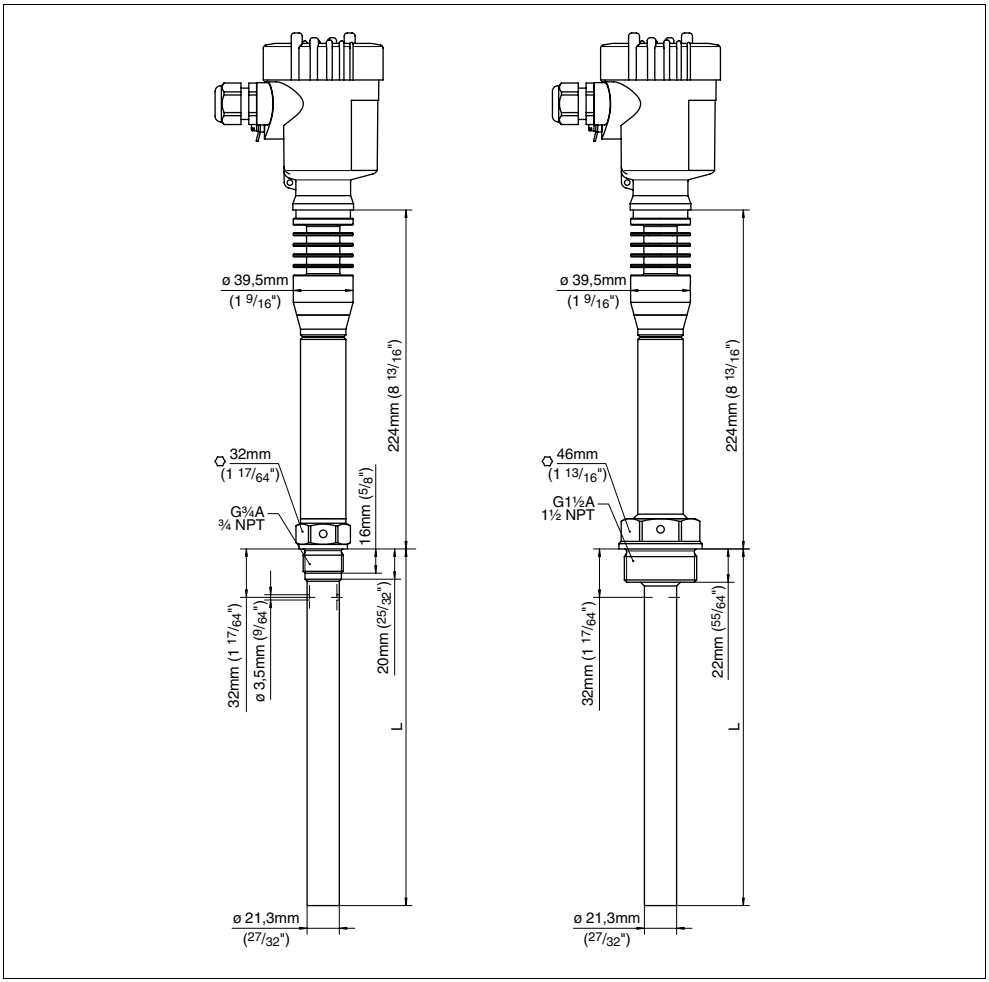
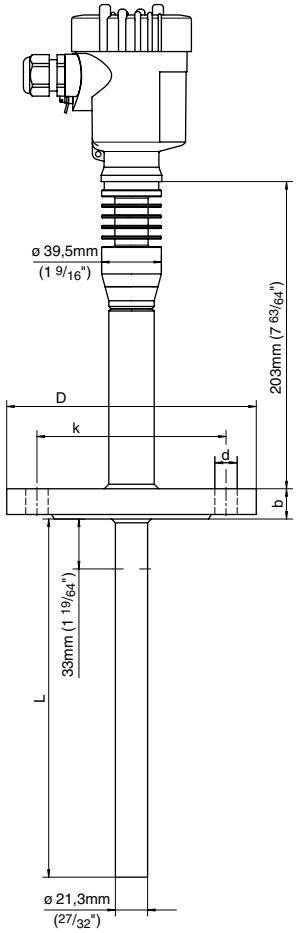


Fig. 27: VEGAPULS 62 - Standpipe version with thread[17)]

17) The plant operator must provide a suitable support for the standpipe depending on the length and the process conditions.

VEGAPULS 62 - Standpipe version with flange



mm	D	b	k	d
DN 40 PN 40	150	18	110	4xø18
DN 50 PN 40	165	20	125	4xø18
DN 80 PN 40	200	24	160	8xø18
DN 100 PN 16	220	20	180	8xø18
DN 150 PN 16	285	22	240	8xø22
2" 150 lb	152,4	19,1	120,7	4xø19,1
3" 150 lb	190,5	23,9	152,4	4xø19,1
4" 150 lb	228,6	23,9	190,5	8xø19,1
6" 150 lb	279,4	25,4	241,3	8xø22,4

inch	D	b	k	d
DN 40 PN 40	5 29/32"	45/64"	4 21/64"	4xø45/64"
DN 50 PN 40	6 1/2"	25/32"	4 59/64"	4xø45/64"
DN 80 PN 40	7 7/8"	15/16"	6 19/64"	8xø45/64"
DN 100 PN 16	8 21/32"	25/32"	7 3/32"	8xø45/64"
DN 150 PN 16	11 7/32"	55/64"	9 29/64"	8xø55/64"
2" 150 lb	6"	3/4"	4 3/4"	4xø3/4"
3" 150 lb	7 1/2"	15/16"	6"	4xø3/4"
4" 150 lb	9"	15/16"	7 1/2"	8xø3/4"
6" 150 lb	11"	1"	9 1/2"	8xø7/8"

Fig. 28: VEGAPULS 62 - Standpipe version with flange[18)]

[18)] The plant operator must provide a suitable support for the standpipe depending on the length and the process conditions.

10.4 Industrial property rights

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