Operating Instructions

VEGAPULS 62

4 … 20 mA/HART - four-wire

Document ID: 28440

Contents

28440-EN-150630

Safety instructions for Ex areas

Take note of the Ex specific safety instructions for Ex applications. These instructions are attached as documents to each instrument with Ex approval and are part of the operating instructions manual.

Editing status: 2015-06-26

28440-EN-150630

1 About this document

1.1 Function

This operating instructions manual provides all the information you need for mounting, connection and setup as well as important instructions for maintenance and fault rectification. Please read this information before putting the instrument into operation and keep this manual accessible in the immediate vicinity of the device.

1.2 Target group

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

1.3 Symbols 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.

SIL applications
This symbol indicates instructions for functional safety which must be taken into account particularly for safety-relevant applications.

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

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

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

Battery disposal
This symbol indicates special information about the disposal of batteries and accumulators.

28440-EN-150630

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 plant operator.

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

2.2 Appropriate use

VEGAPULS 62 is a sensor for continuous level measurement.

You can find detailed information about the area of application in chapter "*Product description*".

Operational reliability is ensured only if the instrument is properly used according to the specifications in the operating instructions manual as well as possible supplementary instructions.

For safety and warranty reasons, any invasive work on the device beyond that described in the operating instructions manual may be carried out only by personnel authorised by the manufacturer. Arbitrary conversions or modifications are explicitly forbidden.

2.3 Warning about incorrect use

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 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 as well as all prevailing safety regulations and accident prevention rules.

Depending on the model, the emitting frequencies of all radar sensors are either in the C or K band range. The low transmitting power lies far below the internationally permitted limit values. When the instrument is used correctly, it presents no danger to human health. It may be operated without restriction outside of closed metallic vessels.

The instrument must only be operated in a technically flawless and reliable condition. The operator is responsible for trouble-free operation of the instrument.

During the entire duration of use, the user is obliged to determine the compliance of the necessary occupational safety measures with the current valid rules and regulations and also take note of new regulations.

2.5 Safety label on the instrument

The safety approval markings and safety tips on the device must be observed.

2.6 CE conformity

The device fulfills the legal requirements of the applicable EC guidelines. By affixing the CE marking, we confirm successful testing of the product.

You can find the CE Certificate of Conformity in the download section of our homepage.

Electromagnetic compatibility
The instruments are 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 61326-1. If the instrument is used in a different environment, its electromagnetic compatibility with other devices must be ensured by suitable measures.

2.7 Fulfillment of NAMUR recommendations

NAMUR is the automation technology user association in the process industry in Germany. The published NAMUR recommendations are accepted as the standard in field instrumentation.

The device fulfills the requirements of the following NAMUR recommendations:

- NE 21 – Electromagnetic compatibility of equipment
- NE 43 – Signal level for malfunction information from measuring transducers
- NE 53 – Compatibility of field devices and display/adjustment components

For further information see www.namur.de.

2.8 FCC/IC conformity (only for USA/Canada)

The instrument with all antenna versions is FCC/IC approved.

Modifications not expressly approved by the manufacturer 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:

- This device may not cause interference, and
- This device must accept any interference, including interference that may cause undesired operation of the device

According to chapter "*Dimensions*" of this operating instructions manual, the instrument is designed for operation with an 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 Ω.

2.9 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 pro-

28440-EN-150630

tection. The environment management system is certified according to DIN EN ISO 14001.

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

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

3 Product description

3.1 Configuration

Versions

The VEGAPULS 62 radar sensor is available in two electronics versions:

- Standard electronics type PS60**KV**
- Electronics with increased sensitivity type PS60**KE**

The respective version can be determined by means of the type label on the electronics.

The electronics version influences the CE conformity, the factory setting for the medium selection and vessel form, the accuracy as well as the approvals of VEGAPULS 62. The differences are listed in the respective sections of this operating instructions manual.

Scope of delivery

The scope of delivery encompasses:

- Radar sensor
- Documentation
  - Quick setup guide VEGAPULS 62
  - Instructions for optional instrument features
  - Ex-specific "*Safety instructions*" (with Ex versions)
  - if necessary, further certificates
- DVD "*Software*", included therein
  - PACTware/DTM Collection
  - Driver software

Information:
In this operating instructions manual, the optional instrument features are described. The respective scope of delivery results from the order specification.

Constituent parts

The VEGAPULS 62 consists of the components:

- Horn or parabolic antenna
- process fitting (depending on the version flange or thread)
- optionally available with purging air connection, reflux valve
- Housing with electronics
- Housing cover, optionally available with display and adjustment module PLICSCOM

The components are available in different versions.

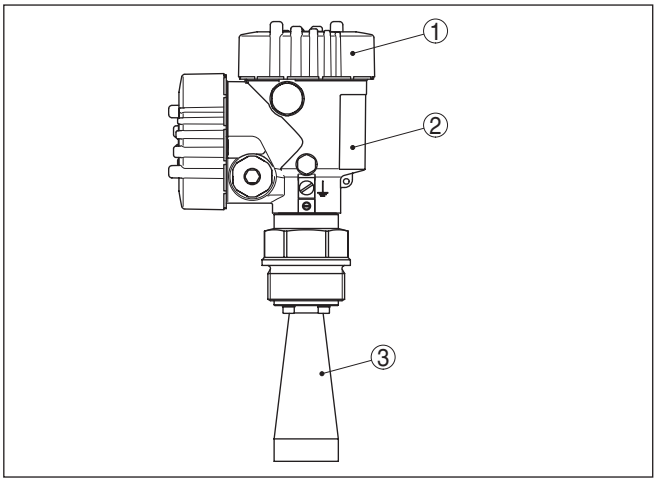


Fig. 1: VEGAPULS 62 - threaded version with Alu double chamber housing

1 Housing cover with integrated PLICSCOM (optional)
2 Housing with electronics
3 Process fitting with horn antenna

Type label

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

- Instrument type
- Article and serial number device
- Article numbers, documentation
- Technical data: Approvals, antenna type, process fitting, process seal/temperature, signal output, voltage supply, protection, protection class
- SIL identification (with SIL rating ex works)

With the serial number, you can access the delivery data of the instrument via www.vega.com, "*VEGA Tools*" and "*serial number search*". You can find the serial number on the inside of the instrument as well as on the type label on the outside.

Scope of this operating instructions manual

This operating instructions manual applies to the following instrument versions:

- Hardware version < 2.0.0
- Software version ≤ 3.8

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 suitable version of VEGAPULS 62 is available for each area of application:

The version with "**thread and horn antenna with ø 40 mm (1.575 in)**" is particularly suitable for small tanks and process vessels for measurement of virtually all products.

The version with "**Flange and horn antenna with ø 48 … 95 mm (1.89 … 3.74 in)**" is particularly suitable for storage tanks and process vessels, for measurement of products such as solvents, hydrocarbons and fuels under most difficult process conditions.

The version with "**Parabolic antenna**" is particularly suitable for precise measurement of products with small dielectric figure.

The electronics version "**Increased sensitivity**" enables the use of VEGAPULS 62 also in applications with very poor reflective properties or products with low e_r value.

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 transit 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.

Voltage supply

Four-wire electronics with separate power supply.

The supply voltage range can differ depending on the instrument version.

The data for power supply are specified in chapter "*Technical data*".

Measured value transmission is carried out via the 4 … 20 mA/HART output separate from power supply.

The backlight of the display and adjustment module is powered by the sensor. The prerequisite for this is a supply voltage at a certain level. The exact voltage specifications are stated in chapter "*Technical data*".

3.3 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 based on ISO 4180.

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 in due 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 packages must be left closed and stored according to the orientation and storage markings on the outside.

Unless otherwise indicated, the packages 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 chapter "*Supplement - Technical data - Ambient conditions*"
- Relative humidity 20 … 85 %

3.4 Accessories and replacement parts

PLICSCOM

The display and adjustment module PLICSCOM is used for measured value indication, adjustment and diagnosis. It can be inserted into the sensor and removed at any time.

You can find further information in the operating instructions "*Display and adjustment module PLICSCOM*" (Document-ID 27835).

VEGACONNECT

The interface adapter VEGACONNECT enables the connection of communication-capable instruments to the USB interface of a PC. For parameter adjustment of these instruments, an adjustment software such as PACTware with VEGA-DTM is required.

You can find further information in the operating instructions "*Interface adapter VEGACONNECT*" (Document-ID 32628).

VEGADIS 81

The VEGADIS 81 is an external display and adjustment unit for VEGA plics® sensors.

For sensors with double chamber housing the interface adapter "*DISADAPT*" is also required for VEGADIS 81.

You can find further information in the operating instructions "*VEGADIS 81*" (Document-ID 43814).

VEGADIS 82

VEGADIS 82 is suitable for measured value indication and adjustment of sensors with HART protocol. It is looped into the 4 … 20 mA/HART signal cable.

You can find further information in the operating instructions "*VEGADIS 82*" (Document-ID 45300).

Protective cap

The protective cover protects the sensor housing against soiling and intense heat from solar radiation.

You will find additional information in the supplementary instructions manual "*Protective cover*" (Document-ID 34296).

Flanges

Flanges are available in different versions according to the following standards: DIN 2501, EN 1092-1, ANSI B 16.5, JIS B 2210-1984, GOST 12821-80.

You can find additional information in the supplementary instructions manual "*Flanges according to DIN-EN-ASME-JIS*" (Document-ID 31088).

Electronics module

Electronics module "VEGAPULS series 60" is a replacement part for radar sensors of VEGAPULS series 60. A different version is available for each type of signal output.

You can find further information in the operating instructions "*Electronics module VEGAPULS series 60*" (Document-ID 30176).

Antenna impedance cone

The antenna impedance cone is a replacement part used for optimum transmission of microwaves and for sealing against the process.

You find further information in the mounting instructions "*Antenna impedance cone VEGAPULS 62 and 68*" (Document-ID 31381).

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 a display and adjustment module. The housing can be rotated by 330° without the use of any tools. You can also install the display and adjustment module in four different positions (each displaced by 90°).

Screwing in

Warning:
With threaded versions, the housing must not be used to screw in the instrument! Applying tightening forces on the housing can damage its internal parts.

Moisture

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

You can give your instrument 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 outdoor mounting as well as installation in areas where high humidity is expected (e.g. through cleaning processes) or on cooled or heated vessels.

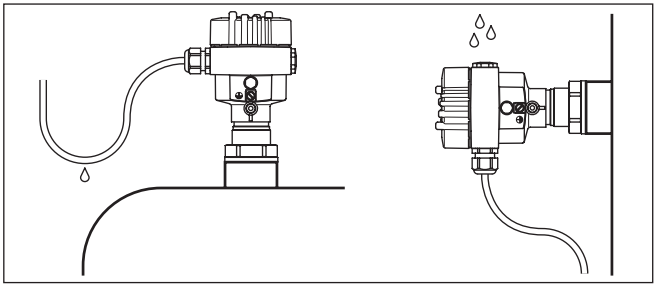


Fig. 2: Measures against moisture ingress

Cable entries - NPT thread

In the case of instrument housings with self-sealing NPT threads, it is not possible to have the cable entries screwed in at the factory. The free openings for the cable glands are therefore covered with red dust protection caps as transport protection.

Prior to setup you have to replace these protective caps with approved cable glands or close the openings with suitable blind plugs.

Measuring range

The reference plane for the measuring range is the lower edge of the flange or the seal surface of the thread.

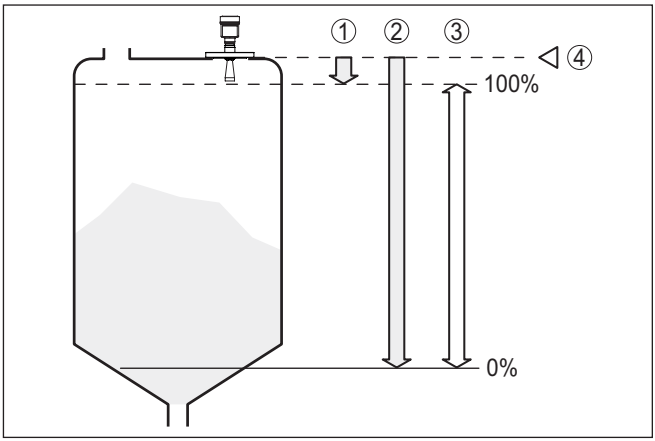


Fig. 3: Measuring range (operating range), max. measuring distance and reference plane

1 full
2 empty (max. measuring distance)
3 Measuring range
4 Reference plane

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

Polarisation plane

The emitted radar impulses of VEGAPULS 62 are electromagnetic waves. The polarisation plane is the direction of the electrical share. Their position is marked on the instrument.

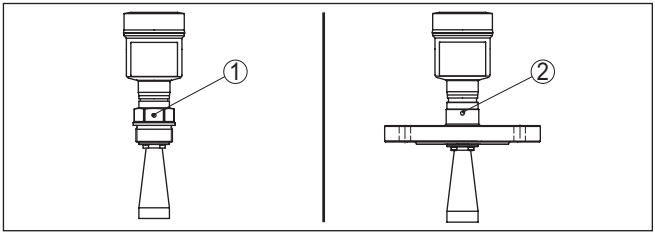


Fig. 4: Position of the polarisation

1 Marking with screwed version
2 Marking with flange version

Suitability for the process conditions

Make sure that all parts of the instrument coming in direct contact with the process, especially the sensor element, process seal and process fitting, are suitable for the existing process conditions, such as process pressure, process temperature as well as the chemical properties of the medium.

You can find the specifications in chapter "*Technical data*" and on the nameplate.

28440-EN-150630

4.2 Mounting preparations - Horn antenna

VEGAPULS 62 is also available in versions where the antenna has a bigger diameter than the process fitting (thread, flange). The antenna must therefore be disconnected from the process fitting before mounting. Proceed as follows:

1. Loosen the hexagon socket screws (3) on the antenna socket with an Allen wrench (size 3)
2. Remove the antenna (4)

Note:
The plastic cone may not be pulled out of the antenna socket.

3. Insert the antenna from below into the vessel socket and secure it against falling off
4. Retighten the antenna with hexagon screws to the antenna socket; torque max. 10 Nm (7.5 lbf ft)

Note:
The VEGAPULS 62 with rinsing air connection or antenna extension is provided with a notch on the antenna socket. This notch must correspond to the marking on the hexagon of the process fitting (the marking specifies the position of the polarisation of the radar signal).

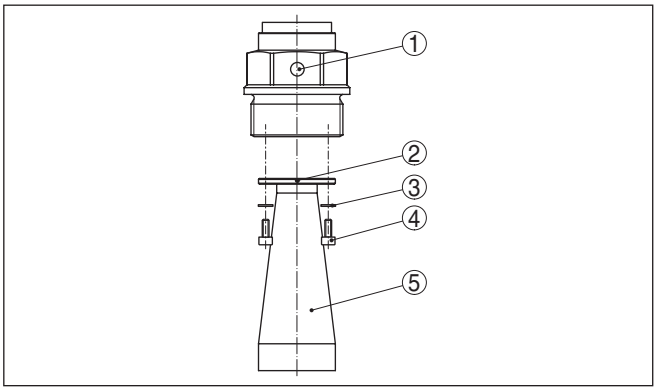


Fig. 5: Dismounting of the horn antenna

1 Marking
2 Notch
3 Hexagon screws on the antenna socket
4 Antenna

4.3 Mounting preparations - Parabolic antenna

VEGAPULS 62 is also available in versions where the antenna has a diameter larger than the process fitting (thread, flange). With such versions the antenna must be disconnected from the process fitting before mounting. Proceed as follows:

1. Clamp VEGAPULS 62 with the flange, e.g. in a bench vice
2. Hold the connection piece (3) with a wrench (spanner size 22) on the flattenings

3. Loosen counter nut (2) with spanner size 36 completely in the direction antenna
4. Loosen compression nut (1) with a wrench SW 41 completely in the direction of the antenna
5. Remove the parabolic antenna (4) axially
6. Mount sensor flange on the adapter flange and fasten it tightly
7. Check if the O-ring seal is present on the connection piece and make sure it is not damaged.

Note:
A damaged O-ring seal must be replaced: FKM article no. 2.28248, FFKM (Kalrez 6375) article no. 2.27351

8. Remount the parabolic antenna (4)
9. Tighten compression nut (1) with SW 41, torque max. 50 Nm
10. Tighten locknut (2) with SW 36, torque max. 40 Nm.

Note:
Take note for VEGAPULS 62 with rinsing air connection that the holes in the antenna and in the process fitting correspond. This ensures a sufficient air flow (the air is led through the holes to the feed system. A rinsing of the parabolic antenna in total is not intended).

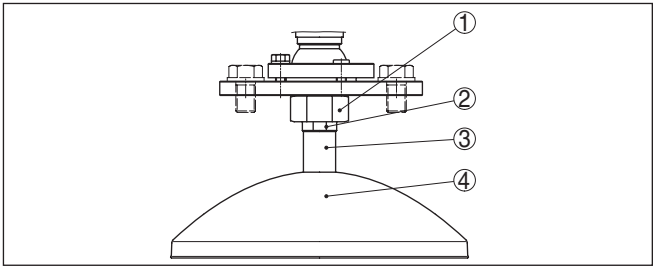


Fig. 6: Dismounting, parabolic antenna

1 Compression nut
2 Locknut
3 Connection piece
4 Parabolic antenna

4.4 Mounting instructions

Horn and parabolic antenna

The illustrations with the following mounting instructions show a VEGAPULS 62 with horn antenna. The mounting instructions apply analogously also to the version with parabolic antenna.

Installation position

When mounting the sensor, keep a distance of at least 200 mm (7.874 in) to the vessel wall. If the sensor is installed in the center of dished or round vessel tops, multiple echoes can arise. These can, however, be suppressed by an appropriate adjustment (see chapter "*Setup*").

If you cannot maintain this distance, you should carry out a false signal storage during setup. This applies particularly if buildup on the

vessel wall is expected. In such cases, we recommend repeating the false signal storage at a later date with existing buildup.

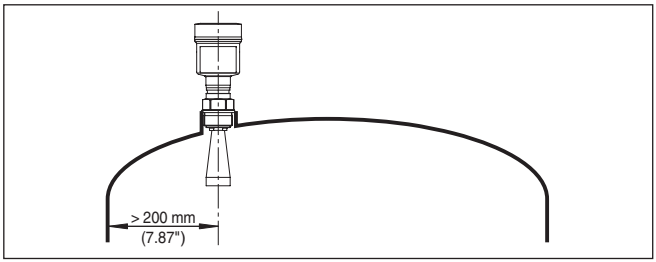


Fig. 7: Mounting on round vessel tops

1 Reference plane
2 Vessel center or symmetry axis

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

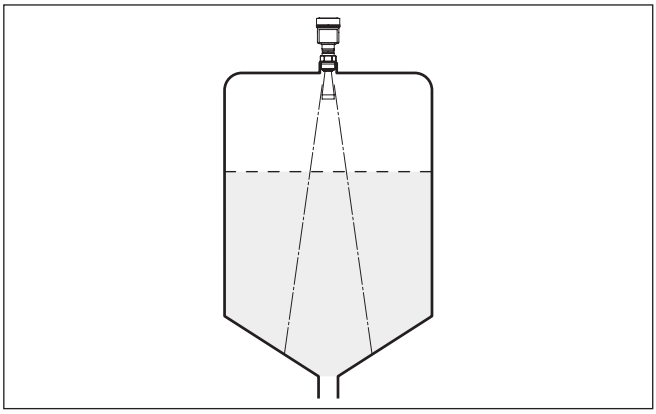


Fig. 8: Vessel with conical bottom

Inflowing medium

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

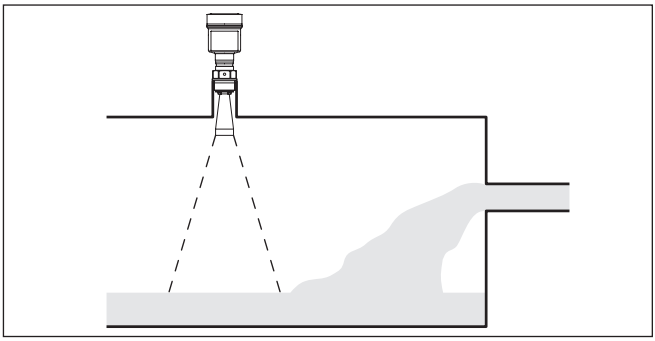


Fig. 9: Inflowing liquid

Socket

The socket piece should be dimensioned in such a way that the antenna end protrudes at least 10 mm (0.4 in) out of the socket.

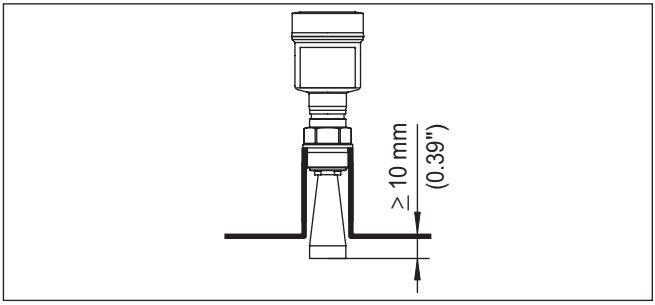
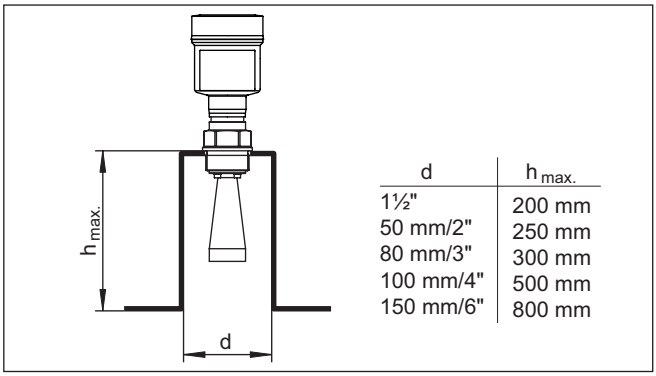


Fig. 10: Recommended socket mounting

If the reflective properties of the medium are good, you can mount VEGAPULS 62 on sockets which are higher than the length of the antenna. You will find recommended values for socket heights in the following illustration. The socket end should be smooth and burr-free, if possible also rounded. After installation you must carry out a false echo storage.



d	h max.
1½"	200 mm
50 mm/2"	250 mm
80 mm/3"	300 mm
100 mm/4"	500 mm
150 mm/6"	800 mm

Fig. 11: Deviating socket dimensions

Tip:
VEGAPULS 62 is optionally also available with antenna extension. The antenna length can thus be selected such that the antenna end protrudes 10 mm (0.4 in) out of the socket.

Sensor orientation

In liquids, direct the sensor as perpendicular as possible to the product surface to achieve optimum measurement results.

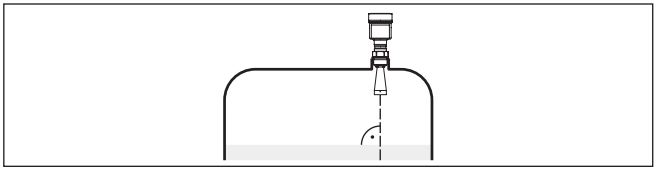


Fig. 12: Alignment in liquids

Vessel installations

The mounting location of the radar sensor should be a place where no other equipment or fixtures cross the path of the microwave signals.

Vessel installations such as for example, ladders, limit switches, heating spirals, struts etc. can cause false echoes that interfere with the useful echo. Make sure when planning your measuring site that the radar signals have a "clear view" 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 baffles above the installations scatter the radar signals and prevent direct interfering reflections.

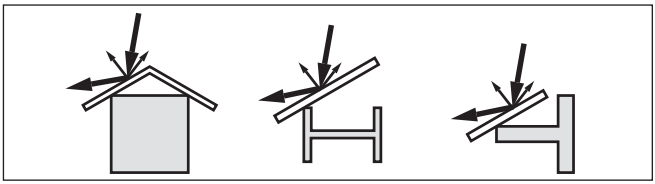


Fig. 13: Cover flat, large-area profiles with deflectors

Agitators

If there are agitators in the vessel, a false signal 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.

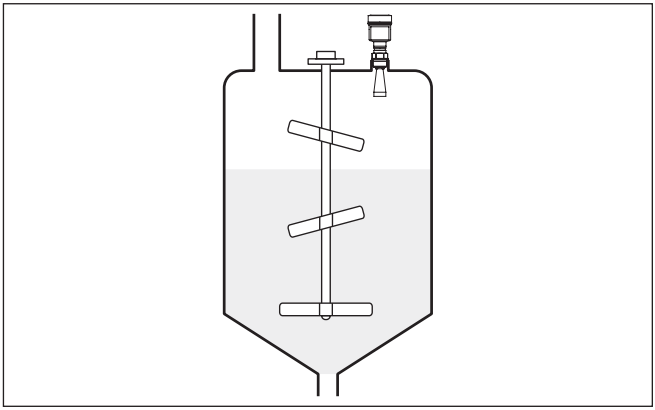


Fig. 14: Agitators

Foam generation

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 lead to measurement errors, you should use the biggest possible radar antennas and low frequency radar sensors (C-band).

As an alternative, sensors with guided microwave can be used. These are unaffected by foam generation and are best suited for such applications.

Measurement in the standpipe (surge or bypass tube)

By using a standpipe, the influence of vessel installations and turbulence can be excluded. Under these prerequisites, the measurement of products with low dielectric constant (from 1.6) is possible.

Note:
Measurement in a standpipe is not recommended for extremely adhesive products.

Surge or bypass tubes must extend all the way down to the requested min. level, as measurement is only possible within the tube.

Surge pipe

Make sure you provide the necessary upper vent hole in the surge pipe. The hole must be aligned so that it and the polarisation marking on the sensor are in the same plane (see illustration: "*Pipe antenna system in a tank*").

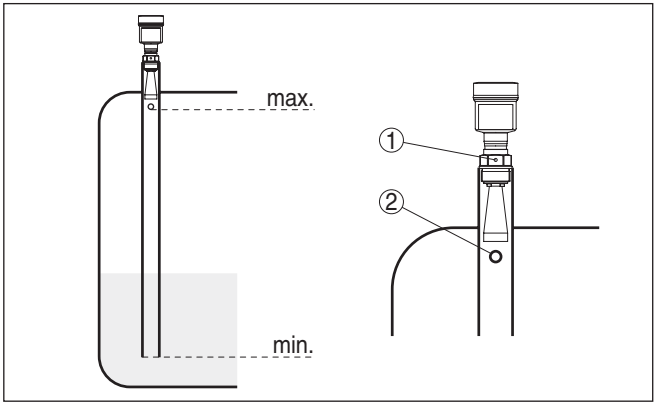


Fig. 15: Pipe antenna system in a tank. The vent hole in the surge pipe must be in one plane with the polarisation marking on the sensor.

1 Marking of the polarisation direction
2 Vent hole max. ø 5 mm (0.2 in)

If possible, the antenna diameter of the sensor should correspond to the inner diameter of the tube. With VEGAPULS 62 this is approx. 40 mm (1.575 in). The sensor can be used with tube diameters between 40 … 80 mm (1.575 … 3.15 in).

Bypass tube

As an alternative to the surge pipe in the vessel, a tube system outside of the vessel is possible as a bypass tube. Select during setup the function "*Bypass tube*".

Align the sensor in such a way that the polarisation marking on the process fitting is in the same plane as the tube holes or the tube connection openings (see following illustration).

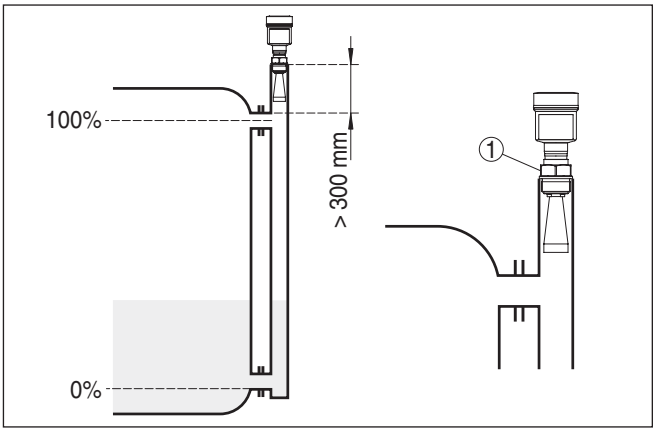


Fig. 16: VEGAPULS 62 in a bypass tube. The polarisation marking on the process fitting must be in one plane with the tube holes or the tube connection openings.

1 Marking of the polarisation direction

When the sensor is mounted on a bypass tube, the distance from VEGAPULS 62 to the upper tube connection should be approx. 300 mm (11.81 in) or more. In case of extremely rough tube inner walls, you should use an inserted tube (tube in tube) or a radar sensor with tube antenna.

Information:
With VEGAPULS 62 in flange version, the polarisation plane is always in the center between two flange holes.

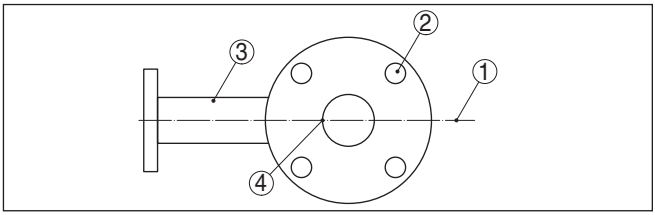


Fig. 17: Polarisation level with flange version, view from top on the sensor and bypass tube. The sensor housing is not shown.

1 Position of the polarisation level
2 Flange hole
3 Upper tube connection
4 Polarisation marking

Flow measurement

The short examples are meant to give only introductory information on the flow measurement. Planning information is available from flume manufacturers and in special literature.

Meas. wall with rectangular flume

In general, the following points must be observed:

- Install the sensor on the headwater side

- Installation in the centre of the flume and vertical to the liquid surface
- Distance to the overfall orifice
- Distance of orifice opening above ground
- Min. distance of the orifice opening to bottom water
- Min. distance of the sensor to max. storage level

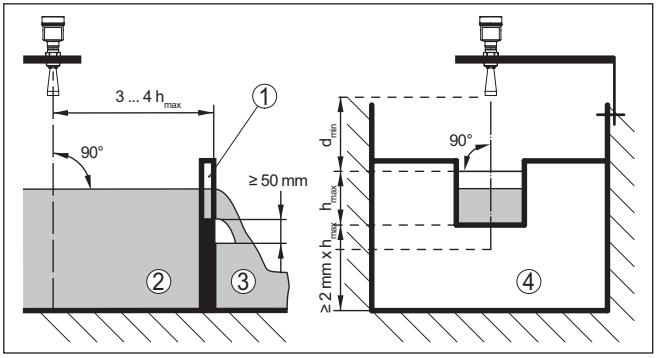


Fig. 18: Flow measurement with rectangular flume: d = min. distance of the sensor; $h_{max.}$ = max. filling of the rectangular flume

1 Overflow orifice (side view)
2 Headwater
3 Tail water
4 Overfall orifice (view from bottom water)

Khafagi-Venturi flume

In general, the following points must be observed:

- Installation of the sensor at the inlet side
- Installation in the centre of the flume and vertical to the liquid surface
- Distance to the Venturi flume
- Min. distance of the sensor to max. storage level

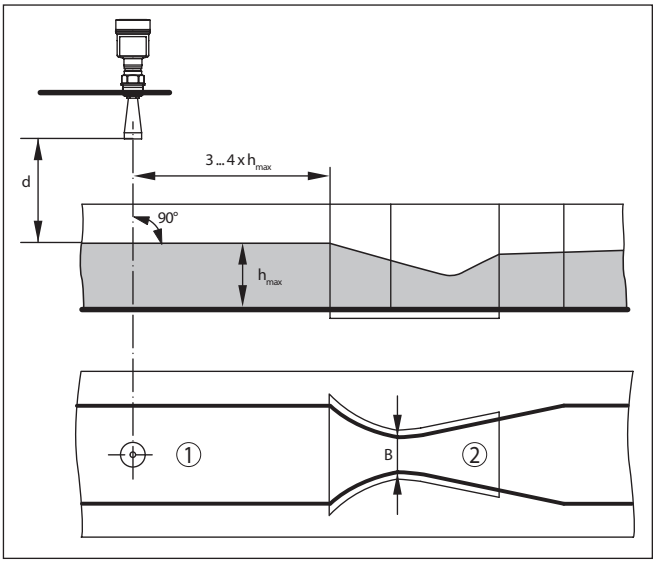


Fig. 19: Flow measurement with Khafagi-Venturi flume: d = Min. distance to sensor; $h_{max.}$ = max. filling of the flume; B = tightest constriction in the flume

1 Position sensor
2 Venturi flume

Gauge measurement

In general, the following points must be observed:

- Installation of the sensor in a protected area
- Installation vertical to the liquid surface

5 Connecting to power supply

5.1 Preparing the connection

Safety instructions

Always keep in mind the following safety instructions:

Warning:
Connect only in the complete absence of line voltage.

- The electrical connection must only be carried out by trained personnel authorised by the plant operator.
- If overvoltage surges are expected, overvoltage arresters should be installed.

Voltage supply

Supply voltage and current output are carried on separate two-wire connection cables if reliable separation is required. The supply voltage range can differ depending on the instrument version.

The data for power supply are specified in chapter "*Technical data*".

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.

Always connect the instrument to vessel ground (potential equalisation) 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.

Connection cable

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

The 4 … 20 mA current output is connected with standard two-wire cable without screen. If electromagnetic interference is expected which is above the test values of EN 61326 for industrial areas, screened cable should be used.

Use cable with round cross section for instruments with housing and cable gland. To ensure the seal effect of the cable gland (IP protection rating), find out which cable outer diameter the cable gland is suitable for.

Use a cable gland fitting the cable diameter.

Cable screening and grounding

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

In Ex systems, the grounding is carried out according to the installation regulations.

With the Exd version, the minus side of the signal output is galvanically connected to ground via protective diodes. When connecting the instrument to a grounded PLC, equalising currents can flow in case

of potential differences which can cause malfunctions. Make sure that there is sufficient potential equalisation from the system side or realise the connection via switching amplifier.

In electroplating and CCP systems (cathodic corrosion protection) it must be taken into account that significant potential differences exist. This can lead to unacceptably high currents in the cable screen if it is grounded at both ends.

Information:
The metallic parts of the instrument (process fitting, housing, etc.) are conductively connected to the ground terminal.

5.2 Connection procedure

Proceed as follows:

1. Unscrew the housing lid
2. Loosen compression nut of the cable entry gland
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, connect the outer ground terminal to potential equalisation
10. Tighten the compression nut of the cable entry gland. 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 lid back on

The electrical connection is finished.

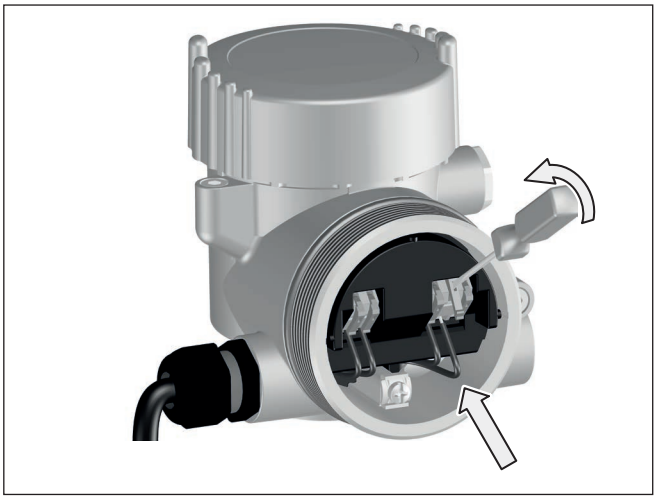


Fig. 20: Connection steps 5 and 6

5.3 Wiring plan, double chamber housing

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

Housing overview

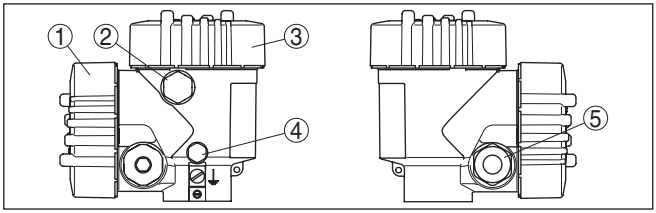


Fig. 21: Double chamber housing

1 *Housing cover, connection compartment*
2 *Blind plug or plug M12 x 1 for VEGADIS 61 (optional)*
3 *Housing cover, electronics compartment*
4 *Filter element for air pressure compensation*
5 *Cable gland*

Electronics compartment

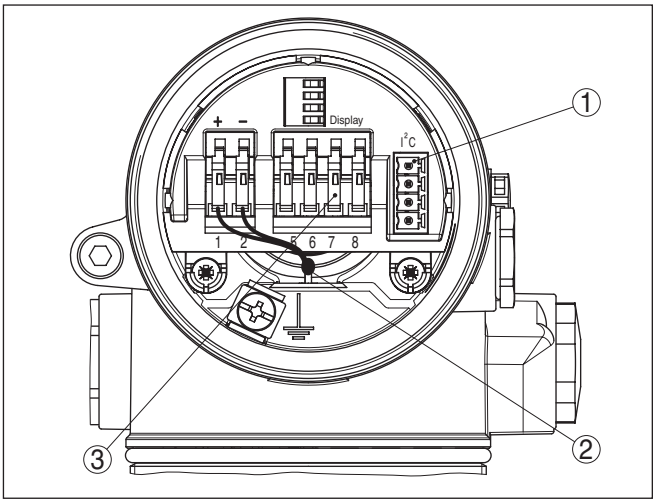


Fig. 22: Electronics compartment, double chamber housing

1 Plug connector for VEGACONNECT (I^2C interface)
2 Internal connection cable to the connection compartment
3 Terminals for VEGADIS 81

Terminal compartment

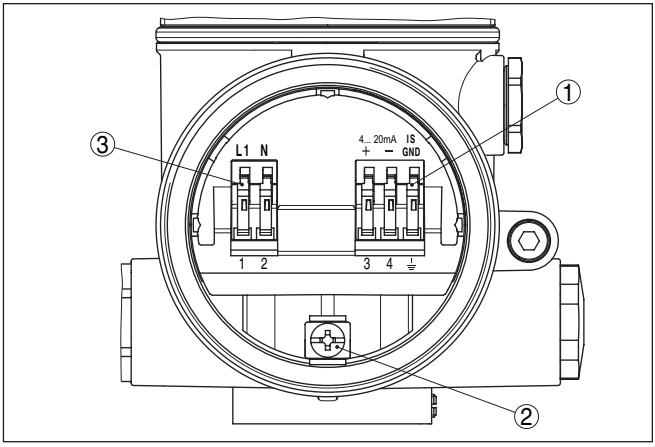


Fig. 23: Terminal compartment, double chamber housing

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

Information:
Keep in mind that the display and adjustment module must only be used in the electronics compartment.

Wiring plan

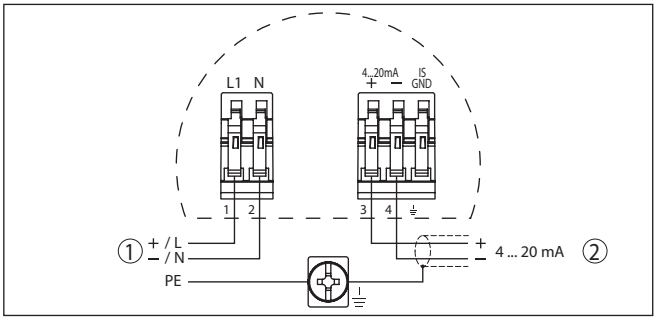


Fig. 24: Wiring plan, double chamber housing

1 Voltage supply
2 Signal output

5.4 Switch-on phase

Switch-on phase

After connecting VEGAPULS 62 to power supply or after a voltage recurrence, the instrument carries out a self-check for approx. 30 seconds:

- Internal check of the electronics
- Indication of the instrument type, the firmware as well as the sensor TAGs (sensor designation)
- Output signal jumps briefly (approx. 10 seconds) to the set fault current

Then the corresponding current is outputted to the cable (the value corresponds to the actual level as well as the settings already carried out, e.g. factory setting).

6 Set up with the display and adjustment module PLICSCOM

6.1 Short description

Function/Configuration

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

- All continuously measuring sensors in single as well as double chamber housing (optionally in the electronics or connection compartment)
- External display and adjustment unit

6.2 Insert display and adjustment module

Mount/Dismount display and adjustment module

The display 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 lid
2. Place the display 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 display and adjustment module onto the electronics and turn it to the right until it snaps in
4. Screw housing lid with inspection window tightly back on

Disassembly is carried out in reverse order.

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

Fig. 25: Insert display and adjustment module

Note:
If you intend to retrofit the instrument with a display and adjustment module for continuous measured value indication, a higher lid with an inspection glass is required.

6.3 Adjustment system

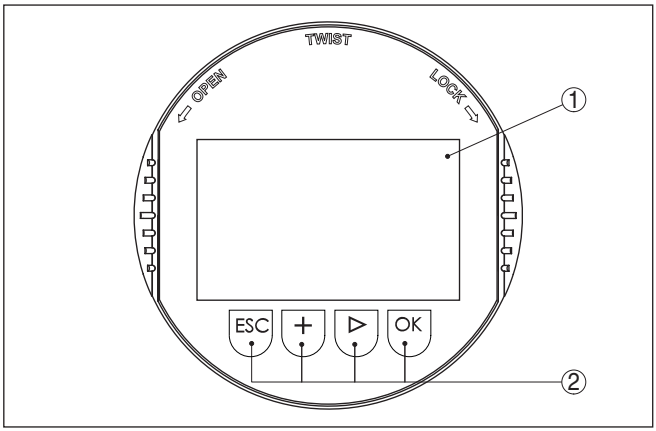


Fig. 26: Display and adjustment elements

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
  - Select list entry
  - Select editing position
- ***[+]*** key:
  - Change value of the parameter
- ***[ESC]*** key:
  - Interrupt input
  - Jump to next higher menu

Adjustment system

You adjust the instrument via the four keys of the display and adjustment module. The individual menu items are shown on the LC display. You can find the functions of the individual keys in the previous illustration.

Time functions

By pushing the ***[+]*** and ***[->]*** keys once, the edited value or the cursor changes by one position. By pushing the keys longer than 1 s the change will be continuously.

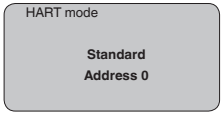
By pushing the ***[OK]*** and ***[ESC]*** keys simultaneously for more than 5 s, a return to the basic menu is caused. The menu language is then switched over to "*English*".

Approx. 60 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 steps

Address setting HART multidrop

In HART-Multidrop mode (several sensors on one input) the address must be set before continuing with the parameter adjustment. You will find a detailed description in the operating instructions manual "*Display and adjustment module*" or in the online help of PACTware or DTM.



Parameterization example

The radar sensor measures the distance from the sensor to the product surface. For indication of the real filling height, an allocation of the measured distance to the percentage height must be carried out.

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.

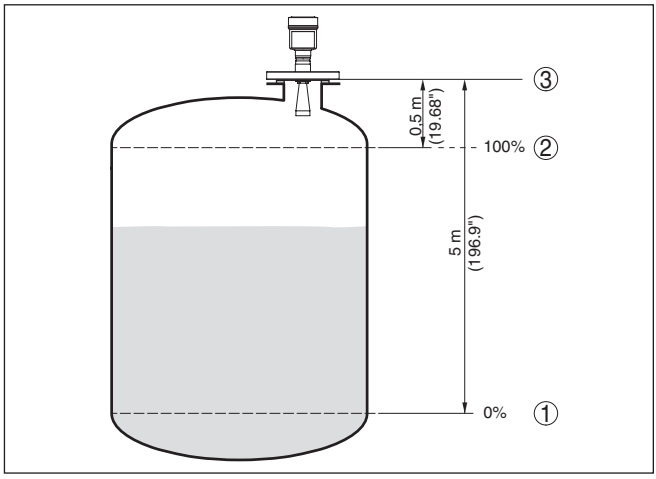


Fig. 27: Parameter adjustment example min./max. adjustment

1 Min. level = max. measuring distance
2 Max. level = min. measuring distance

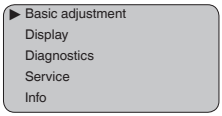
For this adjustment, the distance is entered when the vessel is full and nearly empty. If these values are not known, an adjustment with other distances, for example, 10 % and 90 % is also possible. Starting point for these distance specifications is always the seal surface of the thread or flange.

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.

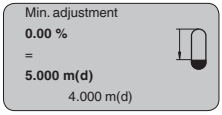
Basic adjustment - Min. adjustment

Proceed as follows:

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



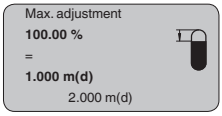
2. Select the menu item "*Basic adjustment*" with ***[->]*** and confirm with ***[OK]***. Now the menu item "*Min. adjustment*" is displayed.



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 suitable distance value in m for the empty vessel (e.g. distance from the sensor to the vessel bottom) corresponding to the percentage value.
5. Save the settings with ***[OK]*** and move to "Max. adjustment" with ***[->]***.

Basic adjustment - Max. adjustment

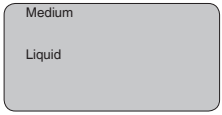
Proceed as follows:



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 ***[->]***.

Basic adjustment - 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*".



Information:
With VEGAPULS 62 with electronics version "*Increased safety*", "*Solid*" is preset as factory setting. However, the instrument should be used preferably in liquids. In such cases, the medium selection should be set to "*Liquid*" during setup.

According to the conductivity and the dielectric constant 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.

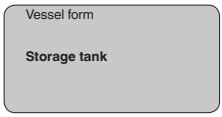
With solids, you can also choose between "*Powder/Dust*", "*Granular/Pellets*" or "*Ballast/Pebbels*".

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

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

Basic adjustment - 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 bulk solid is selected. With "*Liquids*" these are "*Storage tank*", "*Stilling tube*","*Open vessel*" or "*Stirred vessel*", with "*Solid*", "*Silo*" or "*Bunker*".



Information:
With VEGAPULS 62 with electronics version "*Increased safety*", "*Solid*" is preset as factory setting. However, the instrument should be used preferably in liquids. In such cases, the vessel form should be set to "*Storage tank*" during setup.

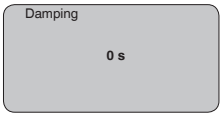
Enter the requested parameters via the appropriate keys, save your settings and jump to the next menu item with the ***[->]*** key.

Basic adjustment - Damping

To suppress fluctuations in the measured value display, e. g. caused by an agitated product surface, a damping can be set. This time can be between 0 and 999 seconds. Keep in mind that the reaction time of

28440-EN-150630

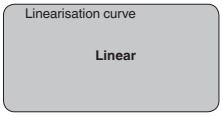
the entire measurement will then be longer and the sensor will react to measured value changes with a delay. In general, a period of a few seconds is sufficient to smooth the measured value display.



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

Basic adjustment - Linearization curve

A linearisation is necessary for all vessels in which the vessel volume does not increase linearly with the level - e.g. in a horizontal cylindrical or spherical tank - and the indication or output of the volume is required. Corresponding linearisation 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*".



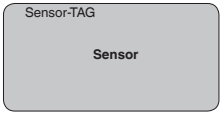
Enter the requested parameters via the appropriate keys, save your settings and jump to the next menu item with the ***[->]*** key.

Caution:
Note the following if the VEGAPULS 62 with corresponding approval is used as part of an overfill protection system according to WHG (Water Resources Act):

If a linearisation curve is selected, the measuring signal is no longer necessarily linear to the filling height. This must be considered by the user especially when adjusting the switching point on the limit signal transmitter.

Basic adjustment - Sensor TAG

In this menu item you can enter an unambiguous designation for the sensor, e.g. the measurement loop name or the tank or product designation. In digital systems and in the documentation of larger plants, a singular designation should be entered for exact identification of individual measuring points.



With this menu item, the Basic adjustment is finished and you can now jump to the main menu with the ***[ESC]*** key.

Display - Displayed value

In the menu item "*Display*" you can define how the measured value should be presented on the display.

The following indication values are available:

- Height
- Distance
- Current
- Scaled
- Percent
- Lin. percent

The selection "*scaled*" opens the menu items "*Display unit*" and "*Scaling*". In "*Display unit*" there are the following options:

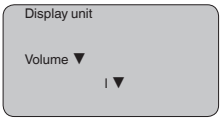
- Height
- Ground
- Flow
- Volume
- Without unit

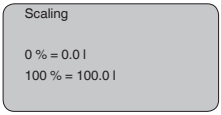
Depending on selection, the different units are in turn available.

In the menu item "*Scaling*", the requested numerical value with decimal point is entered for 0 % and 100 % of the measured value.

There is the following relationship between the indication value in the menu "*Display*" and the adjustment unit in the menu "*Device settings*":

- Indication value "*Distance*": Presentation of the measured value in the selected adjustment unit, e.g. m(d).





Display - Backlight

A background lighting integrated by default can be adjusted via the adjustment menu. The function depends on the height of the supply voltage. See "*Technical data/Voltage supply*".

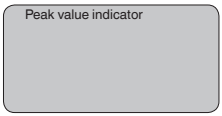
In the default setting, the lightning is switched off.

Diagnosis - Peak value

The respective min. and max. measured values are saved in the sensor. The values are displayed in the menu item "*Peak values*".

- Min. and max. distance in m(d)

- Min. and max. temperature



Diagnosis - Measurement reliability

When non-contact level sensors are used, the measurement can be influenced by the respective process conditions. In this menu item, the measurement reliability of the level echo is displayed as dB value. The measurement reliability equals signal strength minus noise. The higher the value, the more reliable the measurement. With a functioning measurement, the values are > 10 dB.

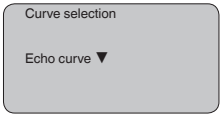
Diagnosis - Curve selection

With ultrasonic sensors, the "**Echo curve**" represents the signal strength of the echoes over the measuring range. The unit of signal strength is "dB". The signal strength enables the jusgement of the quality of the measurement.

The "**False echo curve**" displays the saved false echoes (see menu "*Service*") of the empty vessel as signal strength in "dB" over the measuring range.

Up to 3000 measured values are recorded (depending on the sensor) when starting a "**Trend curve**". Then the values can be displayed on a time axis. The oldest measured values are always deleted.

In the menu item "*Choose curve*", the respective curve is selected.



Information:
The trend recording is not activated when being shipped. It must be started by the user via the menu item "*Start trend curve*".

Diagnosis - Curve presentation

A comparison of the echo curve and the false echo curve allows a more detailled evaluation of measurement reliability. The selected curve is updated continuously. With the ***[OK]*** key, a submenu with zoom functions is opened.

The following functions are available with "**Echo and false echo curve**":

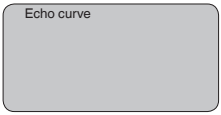
- "X-Zoom": Zoom function for the meas. distance
- "Y-Zoom": 1, 2, 5 and 10x signal magnification in "*dB*"
- "Unzoom": Reset the presentation to the nominal measuring range without magnification

In the menu item "**Trend curve**" the following are available:

- "X-Zoom": Resolution
  - 1 minute
  - 1 hour
  - 1 day

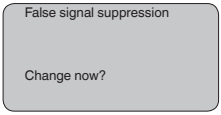
- "Stop/Start": Interrupt a recording or start a new recording
- "Unzoom": Reset the resolution to minutes

As default setting, the recording pattern has 1 minute. With the adjustment software PACTware, this pattern can be also set to 1 hour or 1 day.



Service - False signal suppression

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 low level so that all potential interfering reflections can be detected.



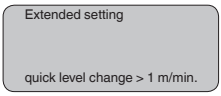
Proceed as follows:

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 a false signal. The level would then no longer be detectable in this area.

Service - Extended setting

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



Note:
Since with the function "*Quick level change > 1 m/min.*" the generation of an average value of the signal processing is considerably reduced, false reflections by agitators or vessel installations can

cause measured value fluctuations. A false echo memory is thus recommended.

Service - Current output

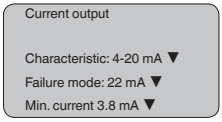
In the menu item "*Current output*" you determine the behaviour of the current output during operation and in case of failure. The following options are available:

Current output

Characteristics	**4 … 20 mA** 20 … 4 mA
Failure mode[1]	Hold value 20.5 mA 22 mA **< 3.6 mA**
Min. current[2]	**3.8 mA** 4 mA
Max. current[3]	**20 mA** 20.5 mA

The values in bold font represent the data of the factory setting.

In HART multidrop mode, the current is constantly 4 mA. This value does not change even in case of failure.



Service - Simulation

In this menu item you simulate a user-defined level or pressure value via the current output. This allows you to test the signal path, e.g. through connected indicating instruments or the input card of the control system.

The following simulation variables are available:

- Percent
- Current
- Pressure (with pressure transmitters)
- Distance (with radar and guided microwave)

With Profibus PA sensors, the selection of the simulated value is made via the "Channel" in the menu "*Basic adjustments*".

How to start the simulation:

1. Push ***[OK]***
2. Select the requested simulation variable with ***[->]*** and confirm with ***[OK]***.
3. Set the requested numerical value with ***[+]*** and ***[->]***.

[1] Value of the current output in case of failure, e.g. if no valid measured value is delivered.
[2] This value is not underrun during operation.
[3] This value is not exceeded during operation.

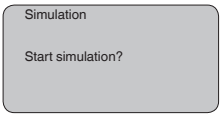
4. Push ***[OK]***

The simulation is now running, with 4 … 20 mA/HART a current is outputted and with Profibus PA or Foundation Fieldbus a digital value.

How to interrupt the simulation:

→ Push ***[ESC]***

Information:
The simulation is automatically terminated 10 minutes after the last pressing of a key.



Service - Reset

Basic adjustment
If the "*Reset*" is carried out, the sensor resets the values of the following menu items to the reset values (see chart):[4]

Menu item	**Reset value**
Max. adjustment	0 m(d)
Min. adjustment	Meas. range end in m(d)[5]
Medium	Liquid
Vessel form	not known
Damping	0 s
Linearization	Linear
Sensor-TAG	Sensor
Displayed value	Distance
Extended settings	None
Current output - characteristics	4 … 20 mA
Current output - max. current	20 mA
Current output - min. current	4 mA
Current output - failure	< 3.6 mA
Unit of measurement	m(d)

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

Menu item	**Reset value**
Backlight	No reset
Language	No reset
SIL	No reset
HART mode	No reset

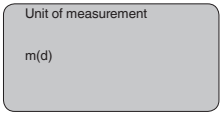
[4] Sensor-specific basic adjustment.
[5] Depending on the sensor type, see chapter "Technical data".

Default setting
Like basic adjustment, but in addition, special parameters are reset to default values.[6)]

Peak value indicator
The min. and max. distance values are reset to the actual value.

Service - Adjustment unit

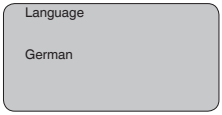
In this menu item you select the internal arithmetic unit of the sensor.



Service - Language

The sensor is already set to the ordered national language. In this menu item you can change the language. The following languages are available, e.g. in software version 3.50:

- Deutsch
- English
- Français
- Espanõl
- Pycckuu
- Italiano
- Netherlands
- Japanese
- Chinese



Service - SIL

The functional safety is already activated Ex factory for instruments with SIL qualification. For instruments Ex factory without SIL qualification, the functional safety must be activated by the user for applications according to SIL via the indicating and adjustment module. The SIL factory setting cannot be deactivated by the user.

The activation of SIL has the following impact:

- In the menu item "*Failure mode*" under "*Current output*", the parameters "*Hold value*" and "*20.5 mA*" are blocked
- In the menu item "*HART mode*", the function "*Multidrop*" is blocked

Note:
For such applications, it is absolutely necessary to take note of "*Safety Manual*".

Service - HART mode

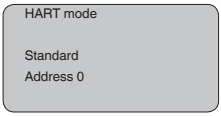
HART offers standard and multidrop mode.

The mode standard with the fixed address 0 means output of the measured value as 4 … 20 mA signal.

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

In Multidrop mode, up to 15 sensors can be operated on one two-wire cable. An address between 1 and 15 must be assigned to each sensor.[7)]

In this menu item you determine the HART mode and enter the address for multidrop.



The default setting is standard with address 0.

Copy sensor data

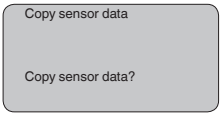
This function enables reading out parameter adjustment data as well as writing parameter adjustment data into the sensor via the display and adjustment module. A description of the function is available in the operating instructions manual "*Display and adjustment module*".

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

- Measured value presentation
- Adjustment
- Medium
- Inner diameter of the standpipe (with standpipe versions)
- Vessel form
- Damping
- Linearisation curve
- Sensor-TAG
- Displayed value
- Display unit
- Scaling
- Current output
- Unit of measurement
- Language

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

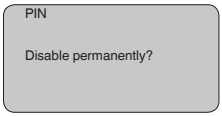
- HART mode
- PIN
- SIL



Service - PIN

In this menu item, the PIN is activated/deactivated permanently. Entering a 4-digit PIN protects the sensor data against unauthorized access and unintentional modifications. If the PIN is activated permanently, it can be deactivated temporarily (i.e. for approx. 60 min.) in any menu item. The instrument is delivered with the PIN set to 0000.

[7)] The 4 … 20 mA signal of the HART sensor is switched off. The sensor consumes a constant current of 4 mA. The measuring signal is transmitted exclusively as digital HART signal.



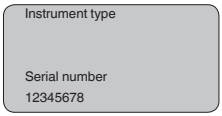
Only the following functions are permitted with activated PIN:

- Select menu items and show data
- Read data from the sensor into the display and adjustment module.

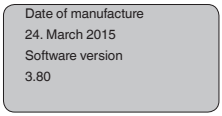
Info

In this menu item the most important sensor information can be displayed:

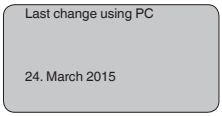
- Instrument type
- Serial number: 8-digit number, e.g. 12345678



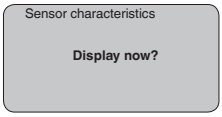
- Date of manufacture: Date of the factory calibration, e.g. 24. March 2015
- Software version: Edition of the sensor software, e.g. 3.80



- Date of last change using PC: Date of the last change of sensor parameters via PC, e.g. 24. March 2015



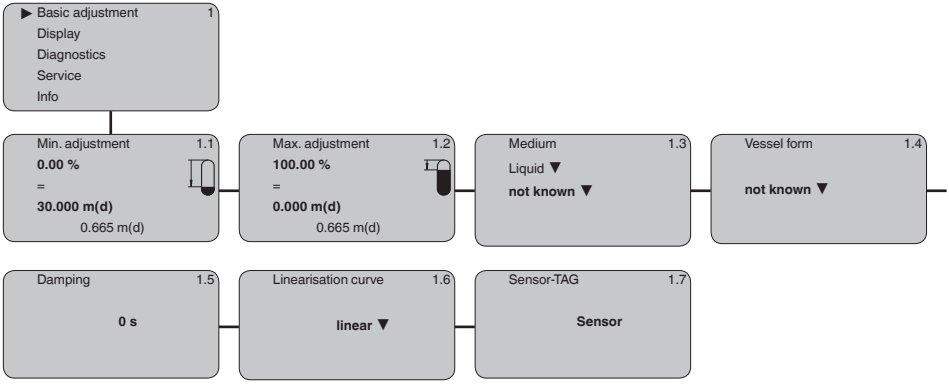
- Sensor details, e.g. approval, process fitting, seal, measuring cell, measuring range, electronics, housing, cable entry, plug, cable length etc.



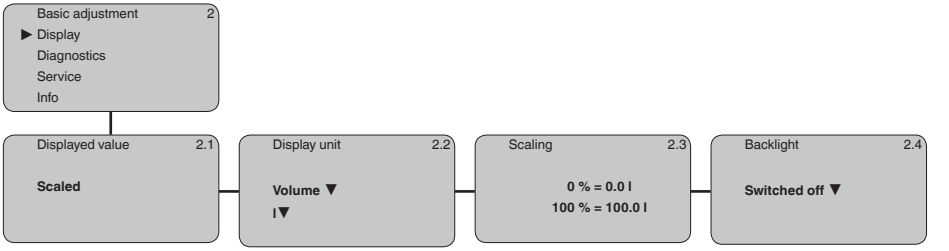
6.5 Menu schematic

Information:
Depending on the version and application, the light-coloured menu windows are not always available or offer nor selection possibility.

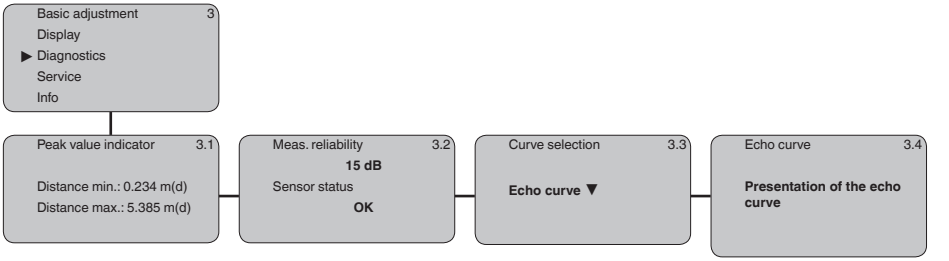
Basic adjustment



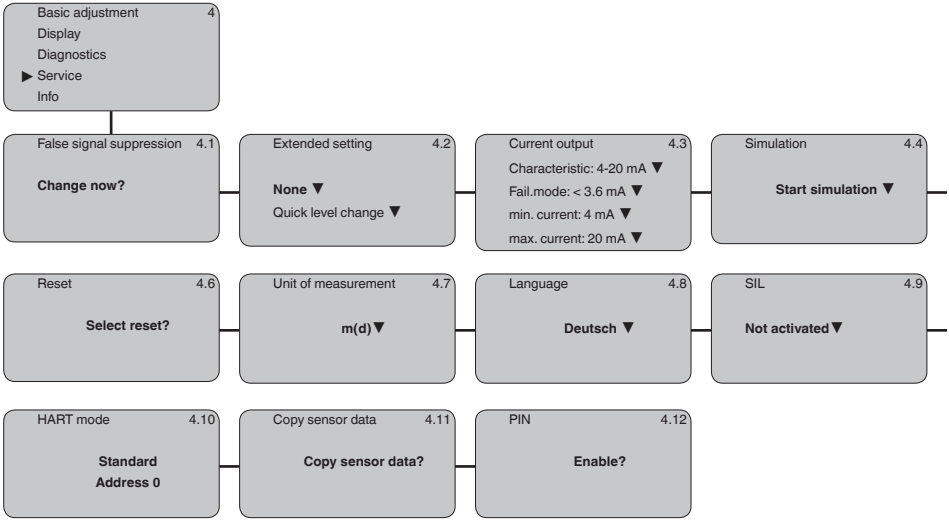
Display



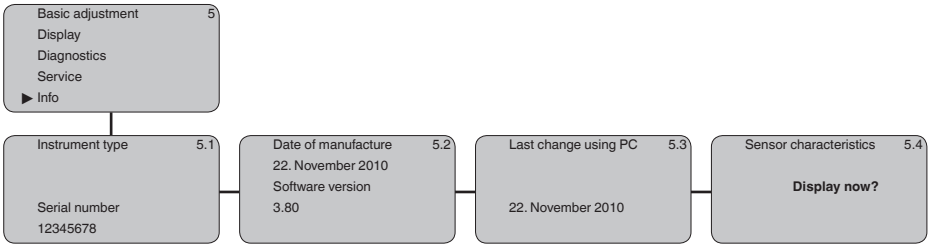
Diagnostics



Service



Info



6.10 Saving the parameter adjustment data

We recommended noting the adjusted data, e.g. in this operating instructions manual, and archiving them afterwards. They are thus available for multiple use or service purposes.

If VEGAPULS 62 is equipped with a display and adjustment module, the most important data can be read out of the sensor into the display and adjustment module. The procedure is described in the operating instructions manual "*Display 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 display 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 Set up with PACTware and other adjustment programs

7.1 Connect the PC

VEGACONNECT directly on the sensor

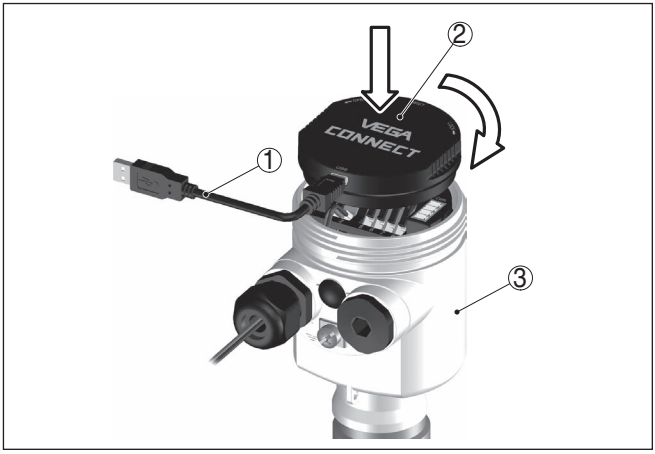


Fig. 28: Connection of the PC via VEGACONNECT directly to the sensor

1 USB cable to the PC
2 VEGACONNECT
3 Sensor

VEGACONNECT externally

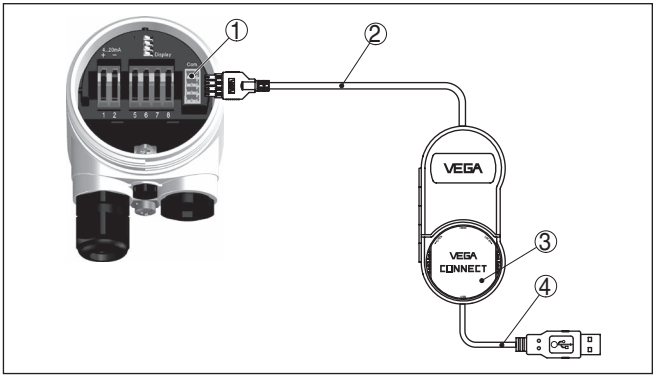


Fig. 29: Connection via VEGACONNECT externally

1 I^2C bus (com.) interface on the sensor
2 I^2C connection cable of VEGACONNECT
3 VEGACONNECT
4 USB cable to the PC

Necessary components:

- VEGAPULS 62
- PC with PACTware and suitable VEGA DTM

- VEGACONNECT
- Power supply unit or processing system

Connection via HART

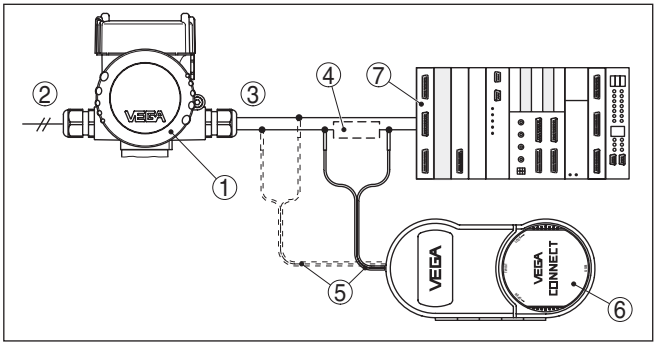


Fig. 30: Connecting the PC via HART to the signal cable

1 VEGAPULS 62
2 HART resistance 250 Ω (optional depending on processing)
3 Connection cable with 2 mm pins and terminals
4 Processing system/PLC/Voltage supply

Necessary components:

- VEGAPULS 62
- PC with PACTware and suitable VEGA DTM
- VEGACONNECT 4
- HART resistance approx. 250 Ω
- Power supply unit or processing system

Note:
With power supply units with integrated HART resistance (internal resistance approx. 250 Ω), an additional external resistance is not necessary. This applies, e. g. to the VEGA instruments VEGATRENN 149A, VEGADIS 371, VEGAMET 381. Common Ex separators are also usually equipped with a sufficient current limitation resistance. In such cases, VEGACONNECT 4 can be connected parallel to the 4 … 20 mA cable.

7.2 Parameter adjustment with PACTware

Prerequisites

For parameter adjustment of the instrument via a Windows PC, the configuration software PACTware and a suitable instrument driver (DTM) according to FDT standard are required. The latest PACTware version as well as all available DTMs are compiled in a DTM Collection. The DTMs can also be integrated into other frame applications according to FDT standard.

Note:
To ensure that all instrument functions are supported, you should always use the latest DTM Collection. Furthermore, not all described functions are included in older firmware versions. You can download the latest instrument software from our homepage. A description of the update procedure is also available in the Internet.

Further setup steps are described in the operating instructions manual "*DTM Collection/PACTware*" attached to each DTM Collection and which can also be downloaded from the Internet. Detailed descriptions are available in the online help of PACTware and the DTMs.

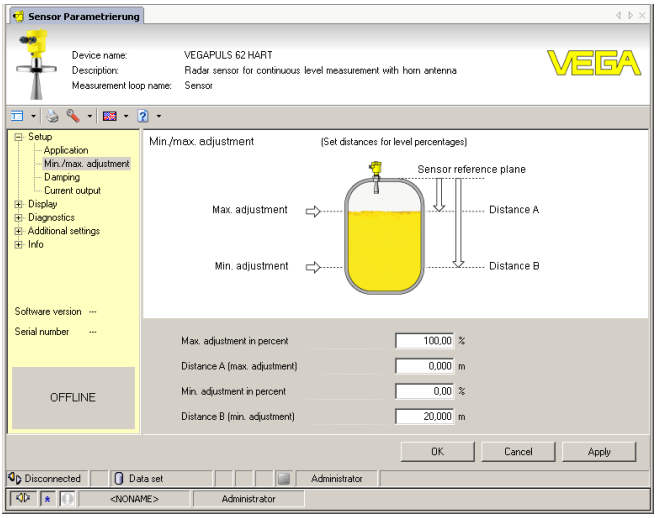


Fig. 31: Example of a DTM view

Standard/Full version

All device DTMs are available as a free-of-charge standard version and as a full version that must be purchased. In the standard version, all functions for complete setup are already included. An assistant for simple project configuration simplifies the adjustment considerably. Saving/printing the project as well as import/export functions are also part of the standard version.

In the full version there is also an extended print function for complete project documentation as well as a save function for measured value and echo curves. In addition, there is a tank calculation program as well as a multiviewer for display and analysis of the saved measured value and echo curves.

The standard version is available as a download under www.vega.com/downloads and "*Software*". The full version is available on CD from the agency serving you.

7.3 Parameter adjustment with AMS™ and PDM

For VEGA sensors, instrument descriptions for the adjustment programs AMS™ and PDM are available as DD or EDD. The instrument descriptions are already implemented in the current versions of AMS™ and PDM.

For older versions of AMS™ and PDM, a free-of-charge download is available via Internet. Move via www.vega.com and "*Downloads*" to "*Software*".

7.4 Saving the parameter adjustment data

It is recommended to document or save the parameter adjustment data. That way they are 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

If the instrument is used properly, no special maintenance is required in normal operation.

8.2 Rectify faults

Reaction when malfunction occurs

The operator of the system is responsible for taking suitable measures to rectify faults.

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
- Voltage 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 display 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 and the faults rectified this way.

24 hour service hotline

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

The hotline is manned 7 days a week round-the-clock. Since we offer this service worldwide, the support is only available in the English language. The service is free, only standard call charges are incurred.

Check the 4 … 20 mA signal

Connect a multimeter in the suitable measuring range according to the wiring plan. The following table describes possible errors in the current signal and helps to eliminate them:

Error	Cause	Rectification
4 … 20 mA signal not stable	Level fluctuations	Set damping via the display and adjustment module
4 … 20 mA signal missing	Electrical connection faulty	Check connection according to chapter "*Connection steps*" and if necessary, correct according to chapter "*Wiring plan*"
	Voltage supply missing	Check cables for breaks; repair if necessary
	Operating voltage too low or load resistance too high	Check, adapt if necessary
Current signal greater than 22 mA or less than 3.6 mA	Electronics module in the sensor defective	Exchange the instrument or send it in for repair

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

Error messages via the display and adjustment module

Error code	Cause	Rectification
E013	no measured value available	– Sensor in boot phase – Sensor does not find an echo, e.g. due to faulty installation or wrong 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 instrument for repair
E041, E042, E043	Hardware error, electronics defective	– Exchange the instrument or send it in for repair

Reaction after fault rectification

Depending on the reason for the fault and the measures taken, the steps described in chapter "*Set up*" may have to be carried out again.

8.3 Exchanging the electronics module

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

In Ex applications, only instruments and electronics modules 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 new electronics module must be loaded with the settings of the sensor. These are the options:

- 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 "*Electronics module*").

Assignment

The electronics modules are adapted to the respective sensor and distinguish also in the signal output or power supply.

8.4 Software update

The following components are required to update the instrument software:

- Instrument
- Voltage supply
- Interface adapter VEGACONNECT

- PC with PACTware
- Current instrument software as file

You can find the current instrument software as well as detailed information on the procedure under "www.vega.com/downloads" and "*Software*".

Caution:
Instruments with approvals can be bound to certain software versions. Therefore make sure that the approval is still effective after a software update is carried out.

You can find detailed information at www.vega.com/downloads and "*Approvals*".

8.5 How to proceed if a repair is necessary

You can find a repair form as well as detailed information on how to proceed at www.vega.com/downloads and "*Forms and certificates*".

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

If a repair is necessary, please proceed as follows:

- 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 contact the agency serving you to get the address for the return shipment. You can find the agency on our home page www.vega.com.

9 Dismount

9.1 Dismounting steps

Warning:
Before dismounting, be aware of dangerous process conditions such as e.g. pressure in the vessel or pipeline, 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 parts 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. 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 on humans and the environment and ensures recycling of useful raw materials.

Materials: see chapter "*Technical data*"

If you have no way to dispose of the old instrument properly, please contact us concerning return and disposal.

10 Supplement

10.1 Technical data

General data	
316L corresponds to 1.4404 or 1.4435	
Materials, non-wetted parts	
– Housing	Aluminium die-casting powder coated, 316L
– Seal between housing and housing cover	NBR (stainless steel housing), silicone (Aluminium housing)
– Inspection window in housing lid for display and adjustment module	Polycarbonate (UL-746-C listed)
– Ground terminal	316Ti/316L
Ohmic contact	Zwischen Erdungsklemme, Prozessanschluss und Antenne
Materials, wetted parts	
– Process fitting	316L, 316L electropolished, 316L Safecoat coated, Alloy C22 (2.4602), stainless steel precision casting (1.4848)
– Seal process fitting - threaded version	Klingersil C-4400
– Antenna	316L, Alloy C22 (2.4602), Alloy 400 (2.4360)
– Antenna cone	PTFE (TFM 1600 PTFE), PP
– seal, antenna system	FKM (SHS FPM 70C3 GLT), FFKM (Kalrez 2035, 6230 (FDA), 6375)
Weight with horn antenna	
– Process fitting - thread, depending on thread size and housing	2 … 2.8 kg (4.409 … 6.173 lbs)
– Process fitting - flange	4.2 … 15.4 kg (9.259 … 33.95 lbs)
– Antenna extension	1.6 kg/m (1.1 lbs/ft)
Length antenna extension max.	5.85 m (19.19 ft)
Weight with parabolic antenna	
– Process fitting - thread, depending on thread size and housing	33 … 4.1 kg (7.275 … 9.7 lbs)
– Process fitting - flange, depending on flange size and housing	5.5 … 16.7 kg (12.13 … 36.82 lbs)

Output variable	
Output signal	4 … 20 mA/HART (active)
Cycle time	min. 1 s (dependent on the parameter setting)
Signal resolution	1.6 µA
Failure signal current output (adjustable)	mA value unchanged 20.5 mA, 22 mA, < 3.6 mA (adjustable)
Max. output current	22 mA
Load	< 500 Ω[8)]

[8)] With inductive load ohmic share min. 25 Ω/mH.

Damping (63 % of the input variable)	0 … 999 s, adjustable
Met NAMUR recommendation	NE 43
HART output values	
– 1. HART value (Primary Value)	Distance to the level
– 2. HART value (Secondary Value)	Distance to the level - scaled (for example hl, %)
Resolution, digital	> 1 mm (0.039 in)

Input variable

Measured variable	distance between process fitting and product surface
Min. distance from antenna end	50 mm (1.969 in)
Recommended meas. range depending on the antenna diameter	
– ø 40 mm (1.575 in)	up to 10 m (32.81 ft)
– ø 48 mm (1.89 in)	up to 15 m (49.21 ft)
– ø 75 mm (2.953 in), ø 95 mm (3.74 in), parabolic antenna	up to 30 m (98.43 ft)
Max. measuring range	up to 35 m (114.83 ft)

Reference conditions to measuring accuracy (according 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 psig)
Other reference conditions	
– Reflector	ideal reflector, e.g. metal plate 2 x 2 m
– False reflections	Biggest false signal, 20 dB smaller than the useful signal

Characteristics and performance data

Measuring frequency	K-band (26 GHz technology)
Meas. interval approx.	1 s
Beam angle -3 dB[9] with horn antenna, depending on the antenna diameter	
– ø 40 mm (1.575 in)	22°
– ø 48 mm (1.89 in)	18°
– ø 75 mm (2.953 in)	10°
– ø 95 mm (3.74 in)	8°
Beam angle -3 dB with parabolic antenna	4°
Step response or adjustment time[10]	> 1 s (dependent on the parameter setting)
Max. level change	Adjustable up to 1 m/min. (dependent on the parameter settings)
Max. emitted HF power of the antenna system	
– Pulse peak power	< 2 mW

[9] Corresponds to the range with 50 % of the emitted power
[10] Time to output the correct level (with max. 10 % deviation) after a sudden level change.

– Pulse duration	< 2 ns
– Average power	< 5 µW
– Average power with 1 m distance	< 200 nW/cm²

Max. emitted HF power of the antenna system - Version with increased sensitivity

– Pulse peak power	< 10 mW
– Pulse duration	< 2 ns
– Average power	< 25 µW
– Average power with 1 m distance	< 1 µW/cm²

Measuring accuracy

Resolution, general	< 1 mm (0.039 in)
Deviation[11]	see diagrams

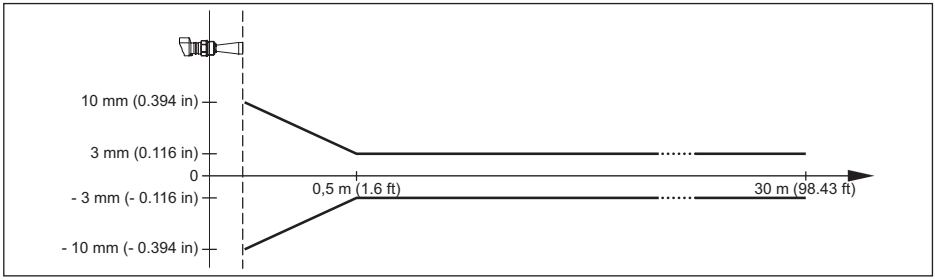


Fig. 32: Deviation VEGAPULS 62 with horn antenna

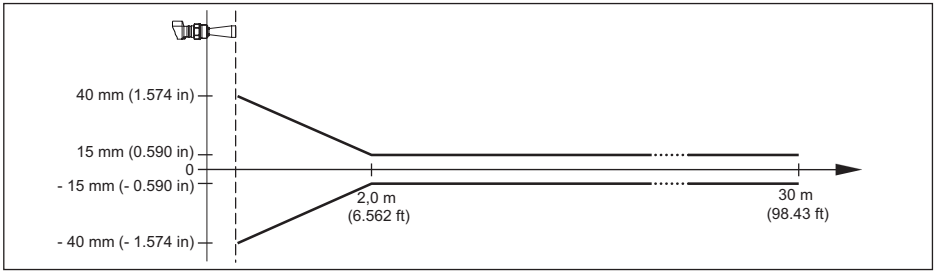


Fig. 33: Deviation VEGAPULS 62 with horn antenna and increased sensitivity

[11] Incl. non-linearity, hysteresis and non-repeatability.

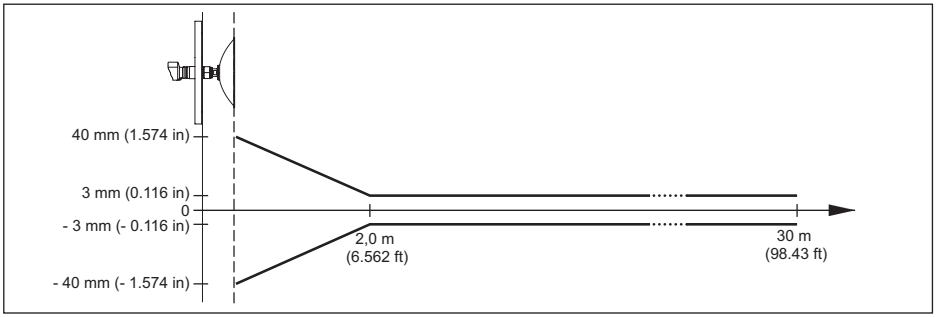


Fig. 34: Deviation VEGAPULS 62 with parabolic antenna

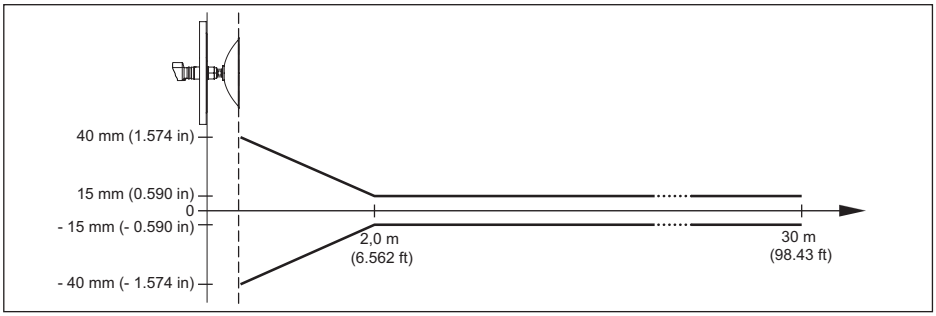


Fig. 35: Deviation VEGAPULS 62 with parabolic antenna and increased sensitivity

Influence of the ambient temperature to the sensor electronics[12)]

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

Influence of the superimposed gas and pressure to the accuracy

The spreading speed of the radar impulses in gas or vapour above the product is reduced by high pressures. This effect depends on the superimposed gas or vapour and increases with low temperatures. The following chart shows the deviation caused by some typical gases or vapours. The stated values refer 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 psig	10 bar/145 psig	50 bar/725 psig
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 %	-	-

[12)] Relating to the nominal measuring range, in the temperature range -40 … +80 °C .

Gas phase	Temperature	1 bar/14.5 psig	10 bar/145 psig	50 bar/725 psig
Water (saturated steam)	180 °C/356 °F	-	2.1 %	-

Ambient conditions

Ambient, storage and transport temperature	-40 … +70 °C (-40 … +158 °F)

Process conditions

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

– FKM (SHS FPM 70C3 GLT)	-40 … +130 °C (-40 … +266 °F)
– FFKM (Kalrez 6375)	-20 … +130 °C (-4 … +266 °F)
– FKM (SHS FPM 70C3 GLT) with temperature adapter	-40 … +200 °C (-40 … +392 °F)
– FFKM (Kalrez 6375) with temperature adapter	-20 … +200 °C (-4 … +392 °F)
– FFKM (Kalrez 2035, 6230) (FDA)	-15 … +130 °C (+5 … +266 °F)
– FFKM (Kalrez 2035, 6230) (FDA) with temperature adapter	-15 … +200 °C (+5 … +392 °F)
– FKM (SHS FPM 70C3 GLT) with impedance cone PP	-40 … +80 °C (-40 … +176 °F)
– FFKM (Kalrez 6375) with impedance cone PP	-15 … +80 °C (+5 … +176 °F)

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

Vessel pressure - horn antenna	-1 … 40 bar/-100 … 4000 kPa (-14.5 … 580 psi)
Vessel pressure - parabolic antenna	-1 … 6 bar/-100 … 6000 kPa (-14.5 … 870 psi)
Vessel pressure relating to the flange nominal pressure stage	see supplementary instructions manual "*Flanges according to DIN-EN-ASME-JIS*"
Vibration resistance[13)]	
– Horn antenna	mechanical vibrations with 4 g and 5 … 100 Hz
– Parabolic antenna	mechanical vibrations with 1 g and 5 … 100 Hz

Data on rinsing air connection

Pressure	< 6 bar (87.02 psi)
Air quantity see diagram	

[13)] Tested according to the guidelines of German Lloyd, GL directive 2.

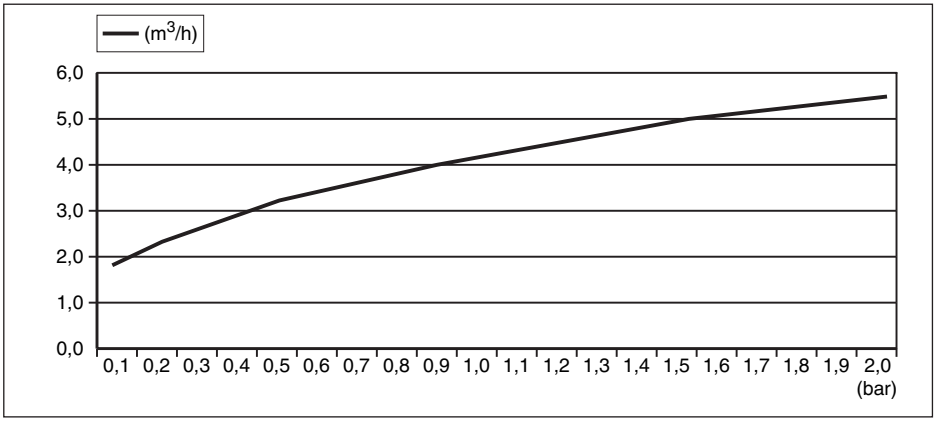


Fig. 36: Air quantity diagram

Thread	G⅛ A
Closure	
– with non-Ex	Dust protection cover of PE
– with Ex	Threaded plug of 316Ti

Reflux valve - unmounted (as option with non-Ex version, included in the scope of delivery with Ex version)

– Material	316Ti
– Seal	FKM, FFKM (Kalrez 6375)
– for tube diameter	6 mm
– opening pressure	0.5 bar (7.252 psi)
– Nominal pressure stage	PN 250

Electromechanical data - version IP 66/IP 67

Cable entry	
– Double chamber housing	– 1 x cable gland M20 x 1.5 (cable: ø 5 … 9 mm), 1 x blind plug M20 x 1.5; plug M12 x 1 for VEGADIS 61 (optional) or: – 1 x closing cap ½ NPT, 1 x blind plug ½ NPT, plug M12 x 1 for VEGADIS 61 (optional) or: – 1 x plug (depending on the version), 1 x blind plug M20 x 1.5; plug M12 x 1 for VEGADIS 61 (optional)
Spring-loaded terminals for wire cross-section	< 2.5 mm² (AWG 14)

Display and adjustment module

Voltage supply and data transmission	through the sensor
Indication	LC display in dot matrix

Adjustment elements	4 keys
Protection rating	
– unassembled	IP 20
– mounted into the sensor without cover	IP 40
Material	
– Housing	ABS
– Inspection window	Polyester foil

Voltage supply

Operating voltage	
– Non-Ex and Ex-d instrument	20 … 72 V DC, 20 … 253 V AC, 50/60 Hz
Max. power consumption	4 VA; 2.1 W

Electrical protective measures

Protection rating	IP 66/IP 67 (NEMA 4X)
Overvoltage category (IEC 61010-1)	
– up to 2000 m (6562 ft) above sea level	III
– up to 5000 m (16404 ft) above sea level	III - Only with connected overvoltage protection
– up to 5000 m (16404 ft) above sea level	II
Protection rating (IEC 61010-1)	I

Functional safety (SIL)

Functional safety is already activated on instruments with SIL qualification ex factory. On instruments without SIL qualification ex factory, the functional safety must be activated by the user via the display and adjustment module or via PACTware for applications according to SIL.

Functional safety according to IEC 61508-4

– Single channel architecture (1oo1D)	up to SIL2
– double channel diversitary redundant architecture (1oo2D)	up to SIL3

You can find detailed information in the supplied Safety Manual of the instrument series or under "www.vega.com", "*Downloads*", "*Approvals*".

Approvals

Instruments with approvals can have different technical specifications depending on the version.

For that reason the associated approval documents of these instruments have to be carefully noted. They are part of the delivery or can be downloaded under www.vega.com via "*VEGA Tools*" and "*Instrument search*" as well as via "*Downloads*" and "*Approvals*".

10.2 Dimensions

Housing

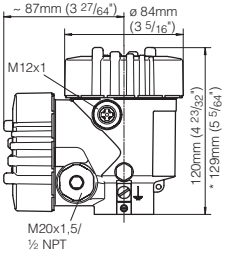
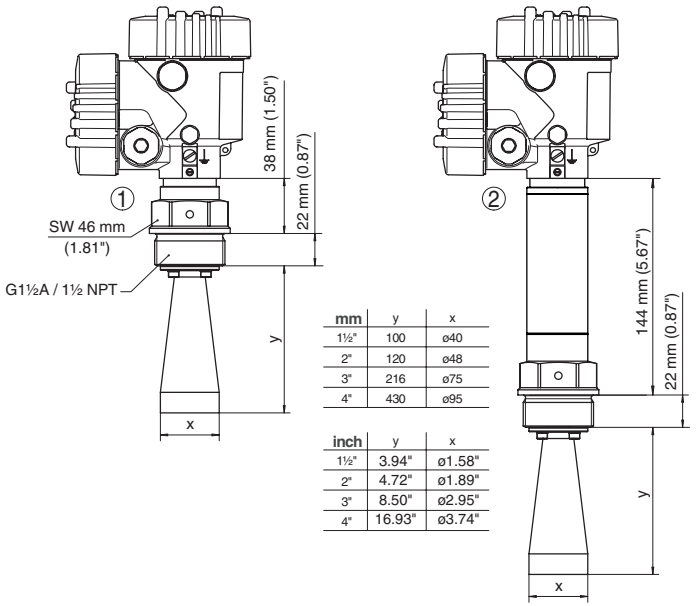


Fig. 37: Double chamber housing (with integrated display and adjustment module the housing is 9 mm/0.35 in higher)

VEGAPULS 62, horn antenna in threaded version



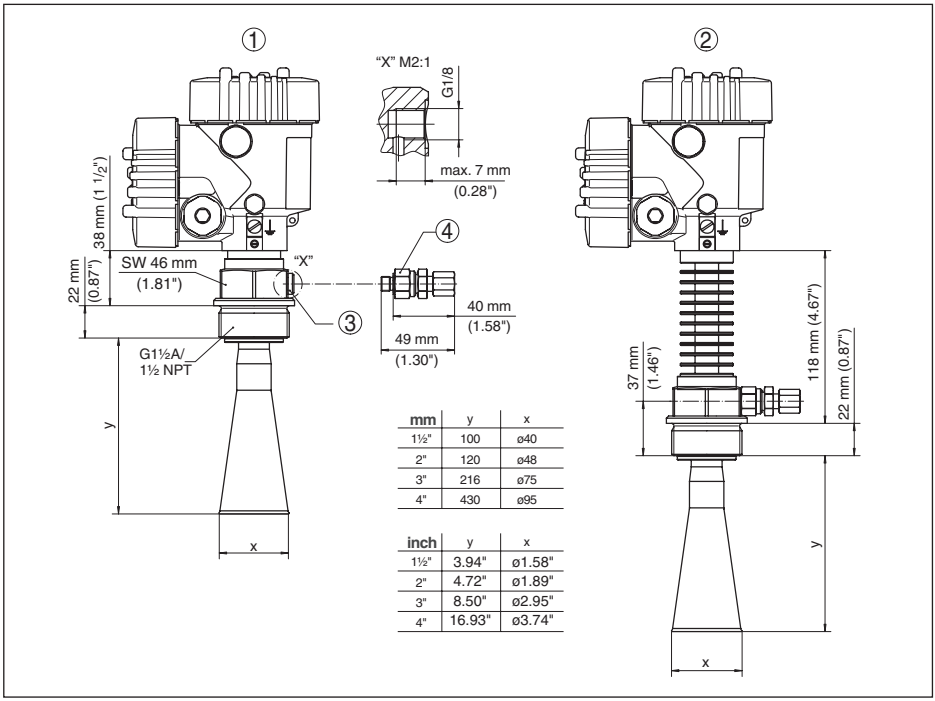
mm	y	x
1½"	100	ø40
2"	120	ø48
3"	216	ø75
4"	430	ø95

inch	y	x
1½"	3.94"	ø1.58"
2"	4.72"	ø1.89"
3"	8.50"	ø2.95"
4"	16.93"	ø3.74"

Fig. 38: VEGAPULS 62, horn antenna in threaded version

1 Standard
2 with temperature adapter

VEGAPULS 62, horn antenna in threaded version with purging air connection



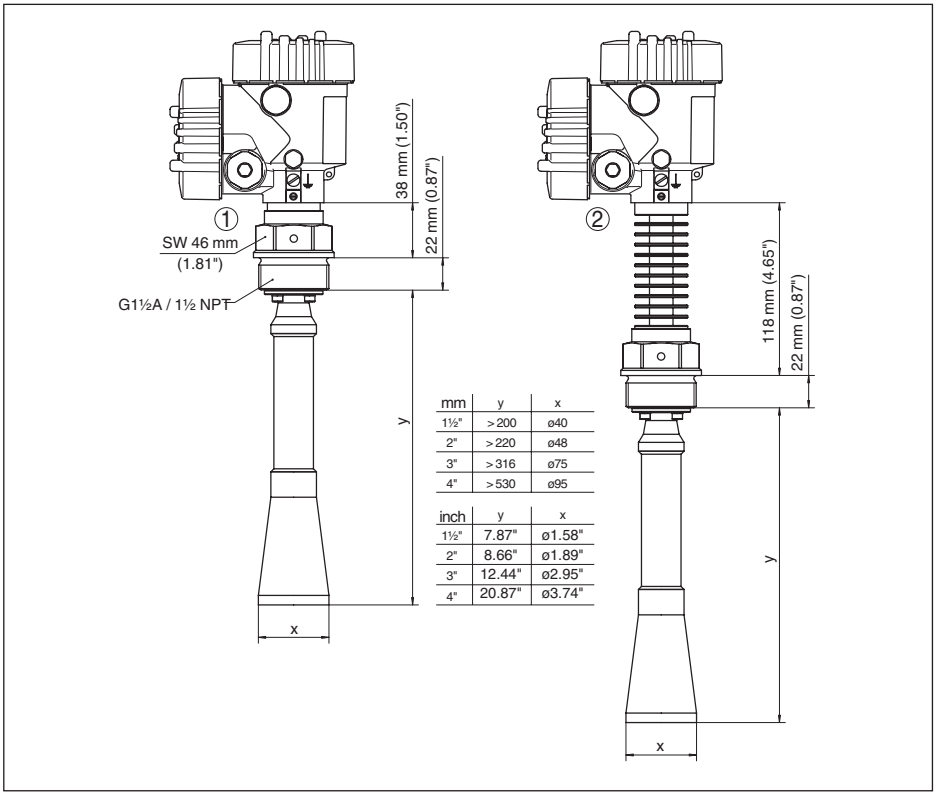
mm	y	x
1½"	100	ø40
2"	120	ø48
3"	216	ø75
4"	430	ø95

inch	y	x
1½"	3.94"	ø1.58"
2"	4.72"	ø1.89"
3"	8.50"	ø2.95"
4"	16.93"	ø3.74"

Fig. 39: VEGAPULS 62, horn antenna in threaded version with purging air connection and reflux valve (option)

1 *Standard*
2 *with temperature adapter*
3 *Purging air connection G⅛ A for mounting of a suitable adapter*
4 *Reflux valve - unmounted (with non-Ex optionally available, with Ex in the scope of delivery), for tube diameters 6 mm*

VEGAPULS 62, horn antenna in threaded version with antenna extension



mm	y	x
1½"	> 200	ø40
2"	> 220	ø48
3"	> 316	ø75
4"	> 530	ø95

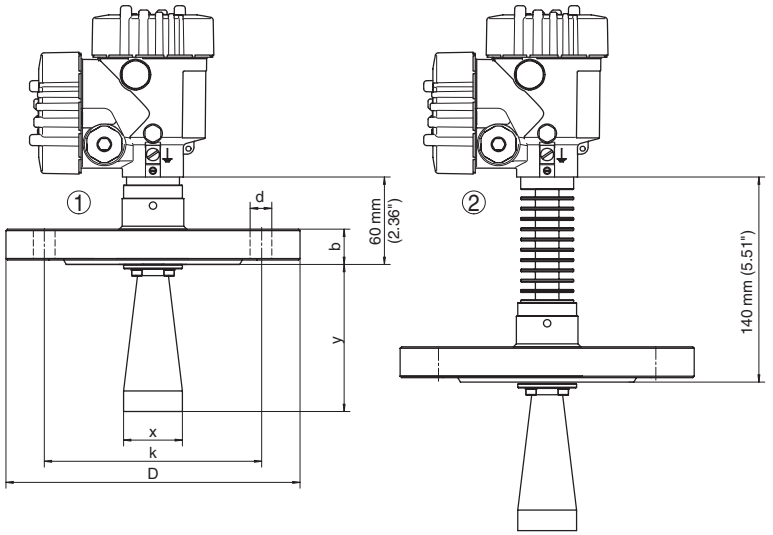
inch	y	x
1½"	7.87"	ø1.58"
2"	8.66"	ø1.89"
3"	12.44"	ø2.95"
4"	20.87"	ø3.74"

Fig. 40: VEGAPULS 62, horn antenna in threaded version with rinsing air connection, antenna extension and reflux valve (option)[14)]

1 Standard
2 with temperature adapter

[14)] An antenna extension causes a reduction of sensitivity at close range in dependence on product properties. A suitable support for the antenna extension must be provided as required by its length.

VEGAPULS 62, horn antenna in flange version



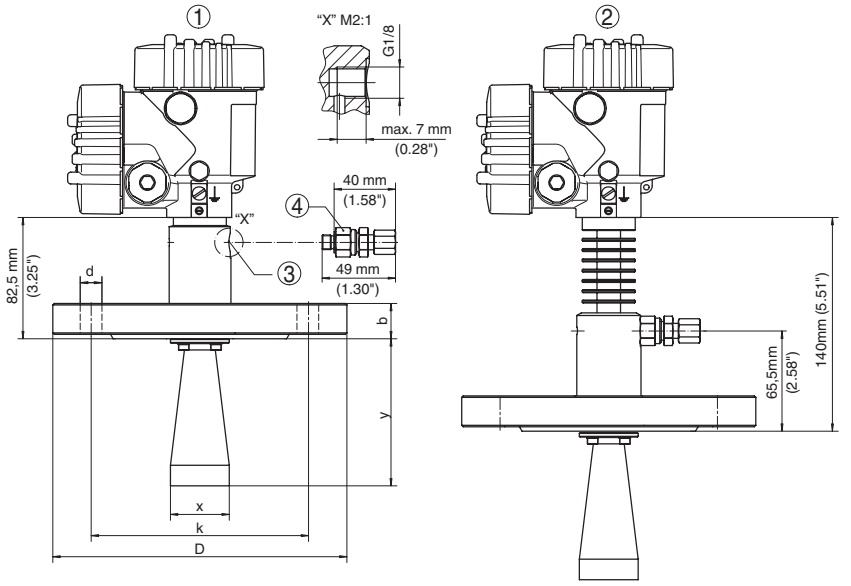
mm	D	b	k	d	x	y
DN 40 PN 40	150	18	110	4xø18	40	100
DN 50 PN 40	165	20	125	4xø18	48	120
DN 80 PN 40	200	24	160	8xø18	75	216
DN 100 PN 16	220	20	180	8xø18	95	430
DN 150 PN 16	285	22	240	8xø22	95	430
2" 150 lb	152,4	19,1	120,7	4xø19,1	48	120
3" 150 lb	190,5	23,9	152,4	4xø19,1	75	216
4" 150 lb	228,6	23,9	190,5	8xø19,1	95	430
6" 150 lb	279,4	25,4	241,3	8xø22,4	95	430

inch	D	b	k	d	x	y
DN 40PN 40	5.91"	0.71"	4.33"	4xø0.71"	1.58"	3.94"
DN 50 PN 40	6.50"	0.79"	4.92"	4xø0.71"	1.89"	4.72"
DN 80 PN 40	7.87"	0.95"	6.30"	8xø0.71"	2.95"	8.50"
DN 100 PN 16	8.66"	0.79"	7.09"	8xø0.71"	3.74"	16.93"
DN 150 PN 16	11.22"	0.87"	9.45"	8xø0.87"	3.74"	16.93"
2" 150 lb	6.00"	0.75"	4.75"	4xø0.75"	1.89"	4.72"
3" 150 lb	7.50"	0.94"	6.00"	4xø0.75"	2.95"	8.50"
4" 150 lb	9.00"	0.94"	7.50"	8xø0.75"	3.74"	16.93"
6" 150 lb	11.00"	1.00"	9.50"	8xø0.88"	3.74"	16.93"

Fig. 41: VEGAPULS 62, horn antenna in flange version

1 Standard
2 with temperature adapter

VEGAPULS 62, horn antenna in flange version with purging air connection



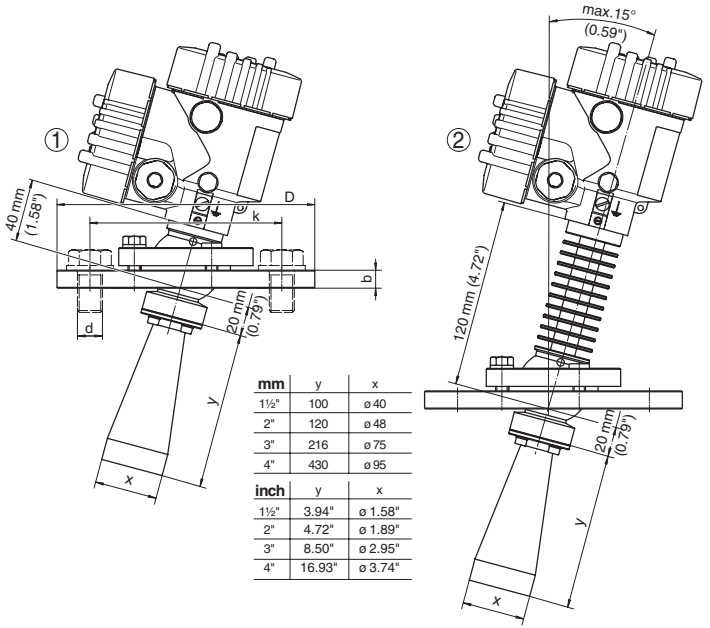
mm	D	b	k	d	x	y
DN 40 PN 40	150	18	110	4xø18	40	100
DN 50 PN 40	165	20	125	4xø18	48	120
DN 80 PN 40	200	24	160	8xø18	75	216
DN 100 PN 16	220	20	180	8xø18	95	430
DN 150 PN 16	285	22	240	8xø22	95	430
2" 150 lb	152,4	19,1	120,7	4xø19,1	48	120
3" 150 lb	190,5	23,9	152,4	4xø19,1	75	216
4" 150 lb	228,6	23,9	190,5	8xø19,1	95	430
6" 150 lb	279,4	25,4	241,3	8xø22,4	95	430

inch	D	b	k	d	x	y
DN 40 PN 40	5.91"	0.71"	4.33"	4xø0.71"	1.58"	3.94"
DN 50 PN 40	6.50"	0.79"	4.92"	4xø0.71"	1.89"	4.72"
DN 80 PN 40	7.87"	0.95"	6.30"	8xø0.71"	2.95"	8.50"
DN 100 PN 16	8.66"	0.79"	7.09"	8xø0.71"	3.74"	16.93"
DN 150 PN 16	11.22"	0.87"	9.45"	8xø0.87"	3.74"	16.93"
2" 150 lb	6.00"	0.75"	4.75"	4xø0.75"	1.89"	4.72"
3" 150 lb	7.50"	0.94"	6.00"	4xø0.75"	2.95"	8.50"
4" 150 lb	9.00"	0.94"	7.50"	8xø0.75"	3.74"	16.93"
6" 150 lb	11.00"	1.00"	9.50"	8xø0.88"	3.74"	16.93"

Fig. 42: VEGAPULS 62, horn antenna in flange version with purging air connection

1 *Standard*
2 *with temperature adapter*
3 *Purging air connection G⅛ A for mounting of a suitable adapter*
4 *Reflux valve - unmounted (with non-Ex optionally available, with Ex in the scope of delivery), for tube diameters 6 mm*

VEGAPULS 62, horn antenna and swivelling holder



mm	y	x
1½"	100	ø 40
2"	120	ø 48
3"	216	ø 75
4"	430	ø 95

inch	y	x
1½"	3.94"	ø 1.58"
2"	4.72"	ø 1.89"
3"	8.50"	ø 2.95"
4"	16.93"	ø 3.74"

DIN

mm	D	b	k	d
DN 50	165	11,5	125	4x ø 18
DN 80	200	11,5	160	8x ø 18
DN 100	220	11,5	180	8x ø 18

inch	D	b	k	d
DN 50 / 2"	6.50"	0.45"	4.92"	4x ø 0.71"
DN 80 / 3"	7.87"	0.45"	6.3"	8x ø 0.71"
DN 100 / 4"	8.66"	0.45"	7.09"	8x ø 0.71"

ASME

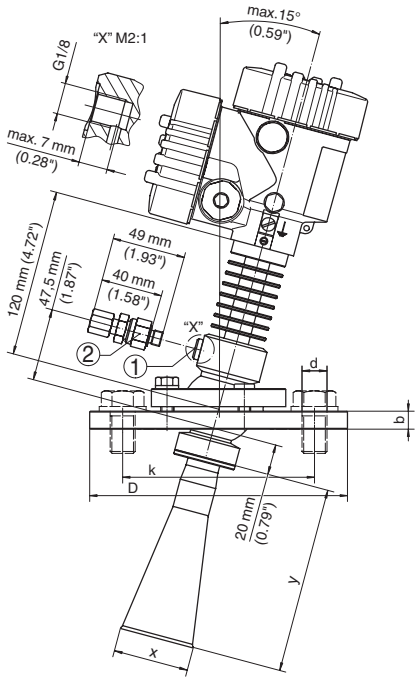
mm	D	b	k	d
2"	152,4	11,5	120,7	4x ø 19,1
3"	190,5	11,5	152,4	4x ø 19,1
4"	228,6	11,5	190,5	8x ø 19,1

inch	D	b	k	d
2"	6"	0.45"	4.75"	4x ø 0.75"
3"	7.5"	0.45"	6"	4x ø 0.75"
4"	9"	0.45"	7.5"	8x ø 0.75"

Fig. 43: VEGAPULS 62, horn antenna and swivelling holder

1 Standard
2 with temperature adapter

VEGAPULS 62, horn antenna, swivelling holder and purging air connection



mm	y	x
1½"	100	ø 40
2"	120	ø 48
3"	216	ø 75
4"	430	ø 95

inch	y	x
1½"	3.94"	ø 1.58"
2"	4.72"	ø 1.89"
3"	8.50"	ø 2.95"
4"	16.93"	ø 3.74"

DIN

mm	D	b	k	d
DN 50	165	11,5	125	4x ø 18
DN 80	200	11,5	160	8x ø 18
DN 100	220	11,5	180	8x ø 18

inch	D	b	k	d
DN 50 / 2"	6.50"	0.45"	4.92"	4x ø 0.71"
DN 80 / 3"	7.87"	0.45"	6.3"	8x ø 0.71"
DN 100 / 4"	8.66"	0.45"	7.09"	8x ø 0.71"

ASME

mm	D	b	k	d
2"	152,4	11,5	120,7	4x ø 19,1
3"	190,5	11,5	152,4	4x ø 19,1
4"	228,6	11,5	190,5	8x ø 19,1

inch	D	b	k	d
2"	6"	0.45"	4.75"	4x ø 0.75"
3"	7.5"	0.45"	6"	4x ø 0.75"
4"	9"	0.45"	7.5"	8x ø 0.75"

Fig. 44: VEGAPULS 62, horn antenna, swivelling holder and rinsing air connection and reflux valve

1 *Standard*
2 *with temperature adapter*
3 *Purging air connection G⅛ A for mounting of a suitable adapter*
4 *Reflux valve - unmounted (with non-Ex optionally available, with Ex in the scope of delivery), for tube diameters 6 mm*

VEGAPULS 62, parabolic antenna in threaded version

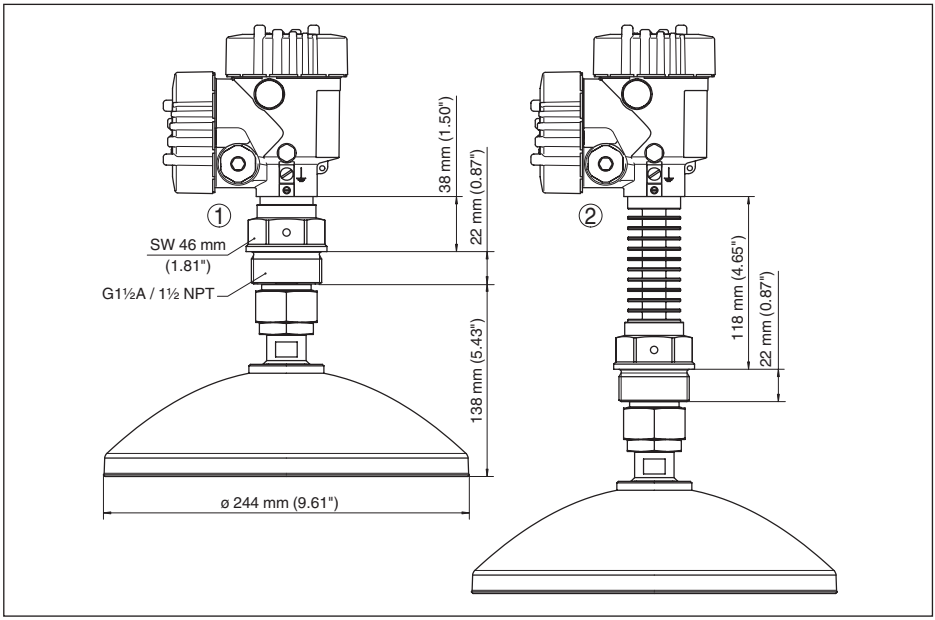
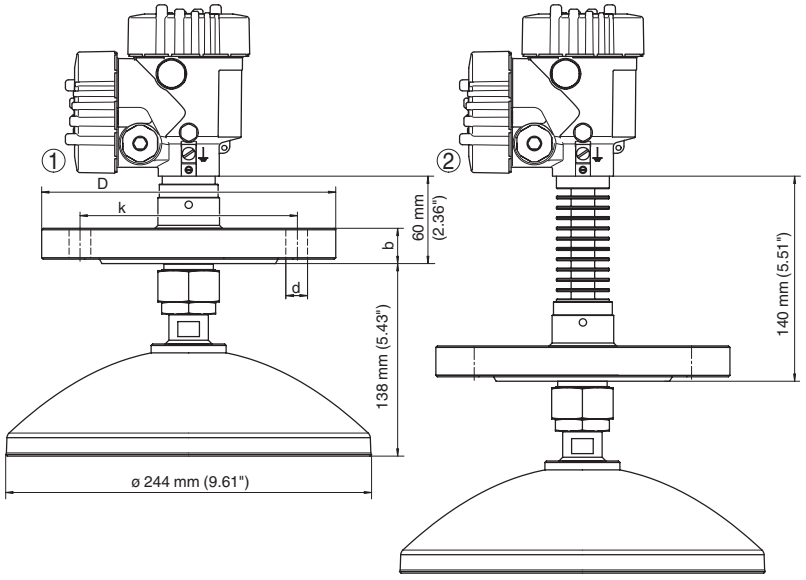


Fig. 45: VEGAPULS 62, parabolic antenna in threaded version

1 Standard
2 with temperature adapter

VEGAPULS 62, parabolic antenna in flange version



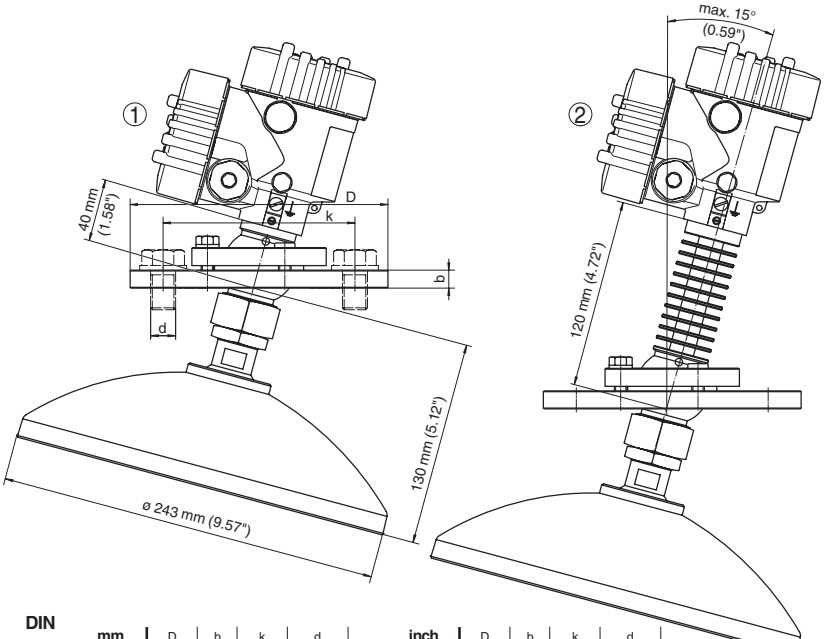
mm	D	b	k	d
DN 40 PN 40	150	18	110	4xø18
DN 50 PN 40	165	20	125	4xø18
DN 80 PN 40	200	24	160	8xø18
DN 100 PN 16	220	20	180	8xø18
DN 150 PN 16	285	22	240	8xø22
2" 150 lb	152,4	19,1	120,7	4xø19,1
3" 150 lb	190,5	23,9	152,4	4xø19,1
4" 150 lb	228,6	23,9	190,5	8xø19,1
6" 150 lb	279,4	25,4	241,3	8xø22,4

inch	D	b	k	d
DN 40PN 40	5.91"	0.71"	4.33"	4xø0.71"
DN 50 PN 40	6.50"	0.79"	4.92"	4xø0.71"
DN 80 PN 40	7.87"	0.95"	6.30"	8xø0.71"
DN 100 PN 16	8.66"	0.79"	7.09"	8xø0.71"
DN 150 PN 16	11.22"	0.87"	9.45"	8xø0.87"
2" 150 lb	6.00"	0.75"	4.75"	4xø0.75"
3" 150 lb	7.50"	0.94"	6.00"	4xø0.75"
4" 150 lb	9.00"	0.94"	7.50"	8xø0.75"
6" 150 lb	11.00"	1.00"	9.50"	8xø0.88"

Fig. 46: VEGAPULS 62, parabolic antenna in flange version

1 Standard
2 with temperature adapter

VEGAPULS 62, parabolic antenna and swivelling holder



DIN

mm	D	b	k	d
DN 50	165	11,5	125	4x ø 18
DN 80	200	11,5	160	8x ø 18
DN 100	220	11,5	180	8x ø 18

inch	D	b	k	d
DN 50 / 2"	6.50"	0.45"	4.92"	4x ø 0.71"
DN 80 / 3"	7.87"	0.45"	6.3"	8x ø 0.71"
DN 100 / 4"	8.66"	0.45"	7.09"	8x ø 0.71"

ASME

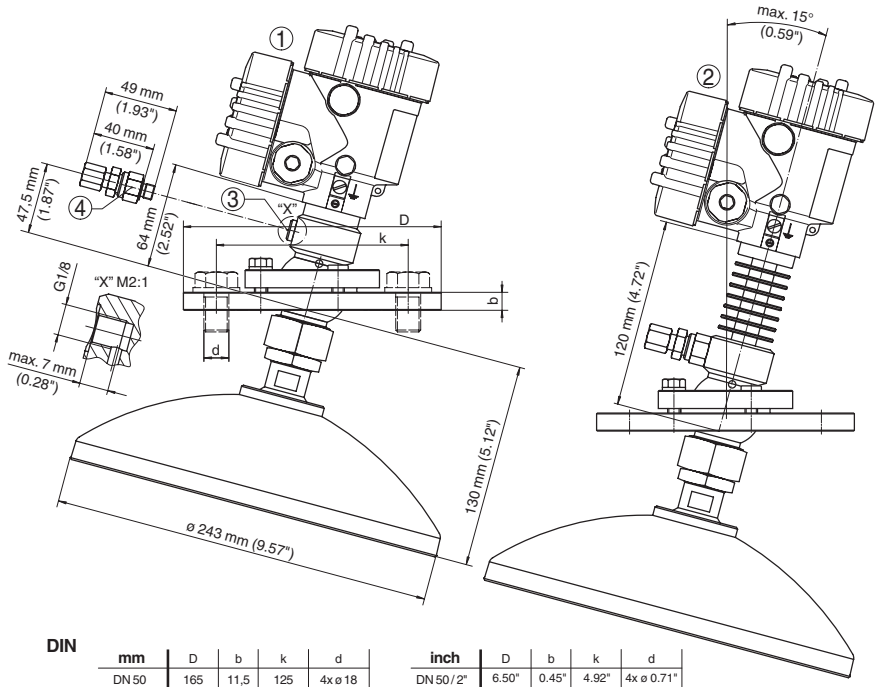
mm	D	b	k	d
2"	152,4	11,5	120,7	4x ø 19,1
3"	190,5	11,5	152,4	4x ø 19,1
4"	228,6	11,5	190,5	8x ø 19,1

inch	D	b	k	d
2"	6"	0.45"	4.75"	4x ø 0.75"
3"	7.5"	0.45"	6"	4x ø 0.75"
4"	9"	0.45"	7.5"	8x ø 0.75"

Fig. 47: VEGAPULS 62, parabolic antenna and swivelling holder

1 Standard
2 with temperature adapter

VEGAPULS 62, parabolic antenna and swivelling holder with purging air connection



DIN

mm	D	b	k	d
DN 50	165	11,5	125	4x ø 18
DN 80	200	11,5	160	8x ø 18
DN 100	220	11,5	180	8x ø 18

inch	D	b	k	d
DN 50 / 2"	6.50"	0.45"	4.92"	4x ø 0.71"
DN 80 / 3"	7.87"	0.45"	6.3"	8x ø 0.71"
DN 100 / 4"	8.66"	0.45"	7.09"	8x ø 0.71"

ASME

mm	D	b	k	d
2"	152,4	11,5	120,7	4x ø 19,1
3"	190,5	11,5	152,4	4x ø 19,1
4"	228,6	11,5	190,5	8x ø 19,1

inch	D	b	k	d
2"	6"	0.45"	4.75"	4x ø 0.75"
3"	7.5"	0.45"	6"	4x ø 0.75"
4"	9"	0.45"	7.5"	8x ø 0.75"

Fig. 48: VEGAPULS 62, parabolic antenna and swivelling holder

1 *Standard*
2 *with temperature adapter*
3 *Purging air connection G⅛ A for mounting of a suitable adapter*
4 *Reflux valve - unmounted (with non-Ex optionally available, with Ex in the scope of delivery), for tube diameters 6 mm*

10.3 Industrial property rights

VEGA product lines are global protected by industrial property rights. Further information see www.vega.com.

Only in U.S.A.: Further information see patent label at the sensor housing.

VEGA Produktfamilien sind weltweit geschützt durch gewerbliche Schutzrechte.

Nähere Informationen unter www.vega.com.

Les lignes de produits VEGA sont globalement protégées par des droits de propriété intellectuelle. Pour plus d'informations, on pourra se référer au site www.vega.com.

VEGA lineas de productos están protegidas por los derechos en el campo de la propiedad industrial. Para mayor información revise la pagina web www.vega.com.

Линии продукции фирмы ВЕГА защищаются по всему миру правами на интеллектуальную собственность. Дальнейшую информацию смотрите на сайте www.vega.com.

VEGA系列产品在全球享有知识产权保护。

进一步信息请参见网站<www.vega.com。

10.4 Trademark

All the brands as well as trade and company names used are property of their lawful proprietor/ originator.

Printing date:

VEGA

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.
Subject to change without prior notice

CE

28440-EN-150630