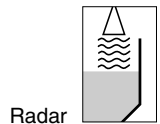


Mounting instructions

Antenna extension for VEGAPULS 62 and 68



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1 For your safety

1.1 Authorised personnel

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

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

1.2 Appropriate use

The antenna extension is an accessory or retrofit component for VEGAPULS radar sensors.

1.3 Warning about misuse

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

1.4 General safety instructions

The safety information in the operating instructions manual of the respective sensor must be noted.

1.5 Safety instructions for Ex areas

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

2 Product description

2.1 Configuration

Scope of delivery

The scope of delivery encompasses:

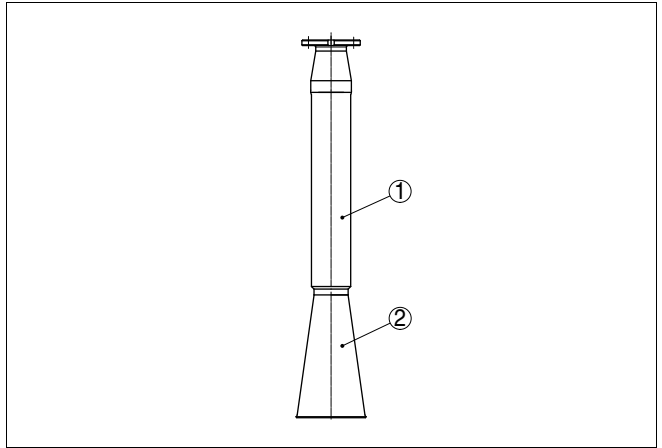
- Antenna extension
- Hexagon screws M4 x 20 mm with washer and spring ring
- Documentation
 - this operating instructions manual

Components

Depending on the version, the antenna extension consists of the following components:

- Extension single-section, with welded horn antenna

This version can be straight, single angled or double angled.



Extension single-section straight, with welded

1 Extension
2 Horn antenna

- Extension multi-sectional, with unassembled horn antenna

With this version, upper as well as middle part can be straight or bent.

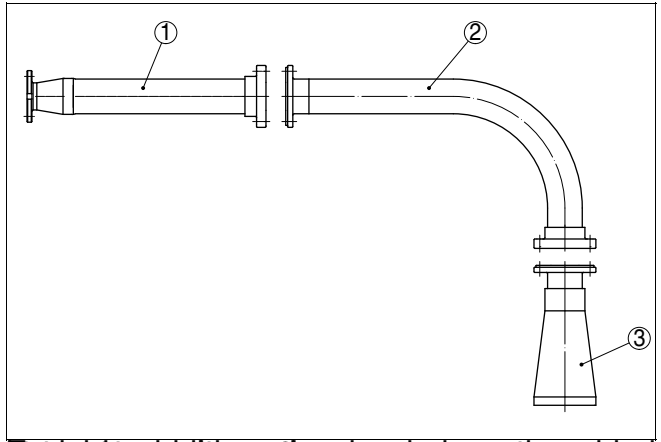


Figure 1: Three-sectional angled, sections assembled

- 1 Upper section
- 2 Middle section
- 2 Horn antenna

2.2 Principle of operation

Area of application

The antenna extension is used as accessory or retrofit component for the following radar sensors:

- VEGAPULS 62
- VEGAPULS 68

Functional principle

The function of the antenna extension is to bring the radar signal into a favourable position for radiating to the product surface, i.e. to prevent false reflections from installations or very long sockets.

3 Mounting

3.1 Mounting preparations

Assignment

When the radar sensor is factory calibrated, it is already adapted to the antenna extension. Correct assignment is important for proper functioning of the measurement. For this reason the antenna parts are marked with the serial number of the sensor.



Note:

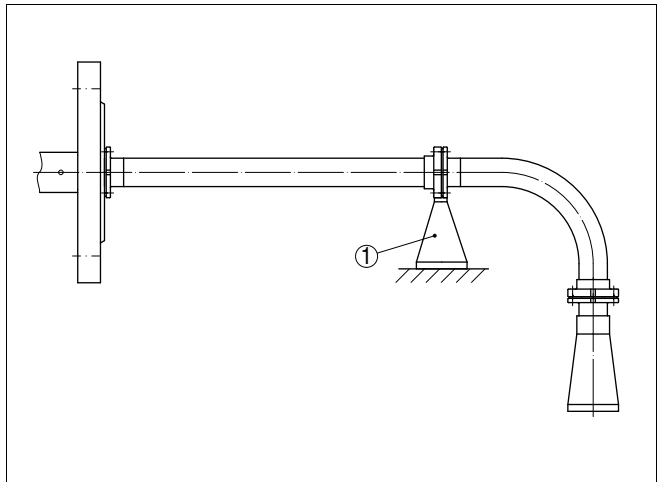
A wrong combination influences the accuracy. Make sure that sensor and antenna extension belong together.

Polarisation plane

The electromagnetic radar signals are polarised, i.e. oriented in a certain plane. With angled antenna extensions, this polarisation plane must be aligned with respect to the angle. By means of the markings on the sensor and the antenna parts, this alignment can be easily carried out.

Support

In case of very long antenna extensions or strong mechanical loads, a mechanical relief for the antenna system is necessary.



Absorption of mechanical loads by supports₁
Support

Tools

The following tools are required for mounting:

- Hexagon spanner size 4

Gap-free mounting

Mounting of antenna extensions must not only be carried out according to mechanical but also microwave technical considerations. For a reliable function of the sensors, the gap-free arrangement of the parts of the antenna extension in the correct position is necessary.

**Note:**

Gaps, additional seals or holes can cause an abundance of false reflections. For that reason the mechanical configuration of the antenna extension must not be modified.

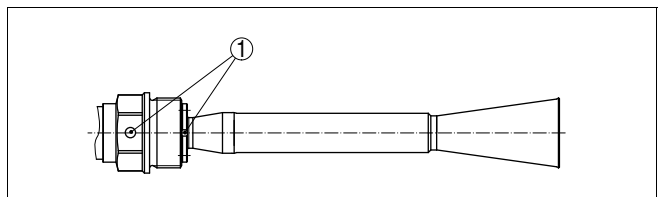
3.3 Mounting steps, single-component antenna extension

Single-section antenna extensions up to a total length of 800 mm (31.5 in) are mounted as a unit and supplied with the radar sensor.

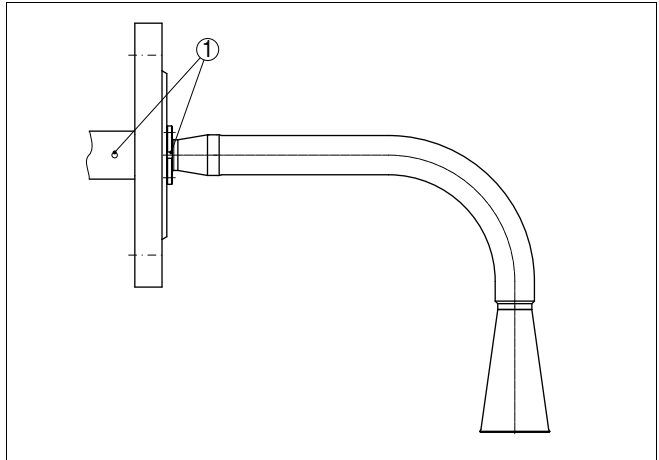
In longer lengths, antenna extension and radar sensor are shipped disassembled for transport-technical reasons and must be reassembled on site.

Proceed as follows:

- 1 Remove conical protective cover from radar sensor
- 2 Assemble radar sensor and antenna extension in such a way that the markings for the polarisation plane are aligned with each other.

**Position of the polarisation markings with threaded version₁**

Markings for the polarisation plane



Position of the polarisation markings with flange version¹

Markings for the polarisation plane

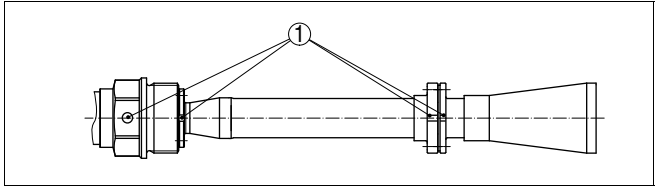
- 3 Fasten antenna extension with screws on the radar sensor
 - 4 Make sure that antenna extension and radar sensor are assembled gap free
 - 5 Tighten screws crosswise, torque max. 2.5 Nm (1.844 lbf ft)
- Mounting is finished.

3.4 Mounting steps, multi-sectional antenna extension

With multi-sectional antenna extensions, the antenna system consists of upper part, middle part and antenna. The parts are shipped disassembled and must be reassembled on site.

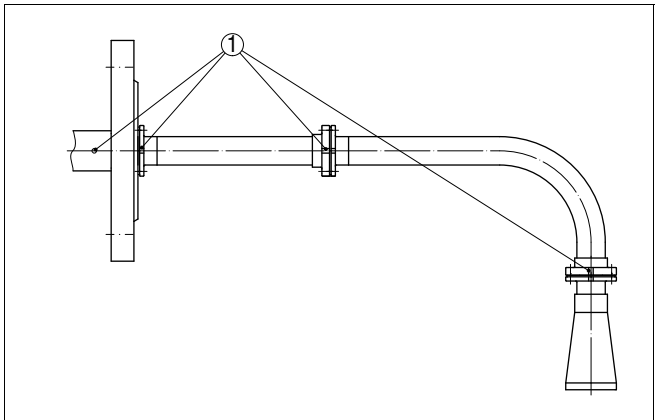
Proceed as follows:

- 1 Remove conical protective cover from radar sensor
- 2 Assemble radar sensor and individual parts of the antenna extension in such a way that the respective markings for the polarisation plane are aligned with each other.



Position of the polarisation markings with threaded version₁

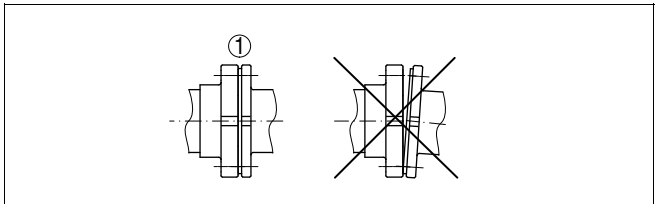
Markings for the polarisation plane



Position of the polarisation markings with flange version₁

Markings for the polarisation plane

- 3 Fasten the individual parts with the supplied screws, starting with the antenna and ending with the upper part
- 4 Make sure that all parts are assembled gap free
- 5 Tighten screws crosswise, torque max. 2.5 Nm (1.844 lbf ft)



Connection after tightening the screws₁

Correct, gap-free mounting

Mounting is finished.

3.5 Mounting control

False echoes due to antenna extensions

Particularly angled, multi-sectional or incorrectly mounted antenna extensions can cause false echoes at close range. These false echoes can influence the function of the measurement. When retrofitting an antenna extension, we recommend making sure all components are correctly mounted before setting up the measurement. The first step is a visual check for gaps and non-aligned polarisation markings.

Supplied antenna extension

When the antenna extension is delivered with the radar sensor, a false echo fade-out has already been carried out at the factory. False echoes caused by the antenna extension are thus eliminated for the signal processing.

Retrofitted antenna extension

After the visual check, the false echo curve is opened and checked via a PC with PACTware™. If everything is mounted correctly, the red echo curve will be above the blue false echo curve. It is generally recommended that the user carry out a false echo fade-out on site.

4 Set up

When using an antenna extension, the position of the reference plane for the radar measurement is partially changed. This should be taken into account for the min./max. adjustment. In chapter "*Dimensions*" of this mounting instructions manual you can find specifications regarding the reference plane in the dimensional drawings.

Setup is carried out according to the operating instructions manual of the respective sensor.

5 Supplement

5.1 Technical data

Materials

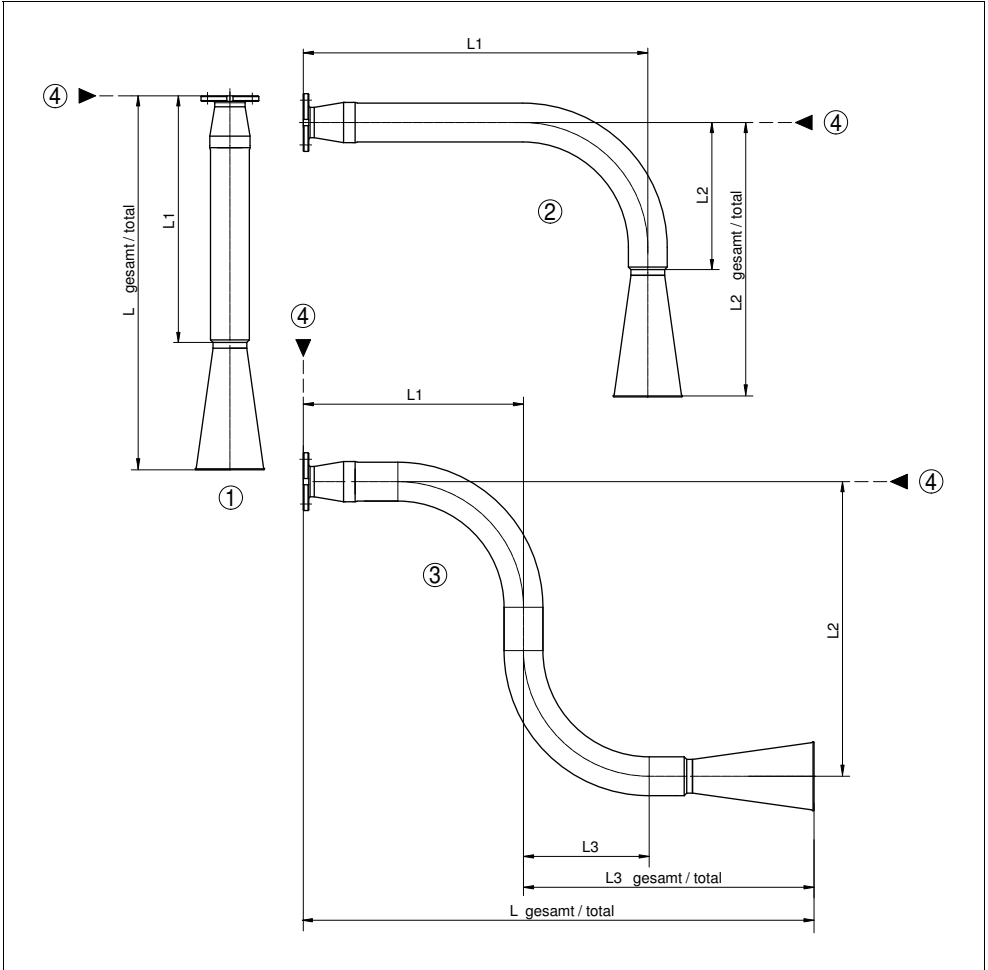
Antenna extension	316L, Hastelloy C22
Screws	316L
Antenna	316L, Hastelloy C22, Safecoat coated

Process conditions

Vessel pressure max.	see operating instructions manual of the respective sensor
Process temperature max.	see operating instructions manual of the respective sensor

5.2 Dimensions

Antenna extension, single-sectional



Extension single-sectional, welded horn antenna, dimensions depending on the order specification₁

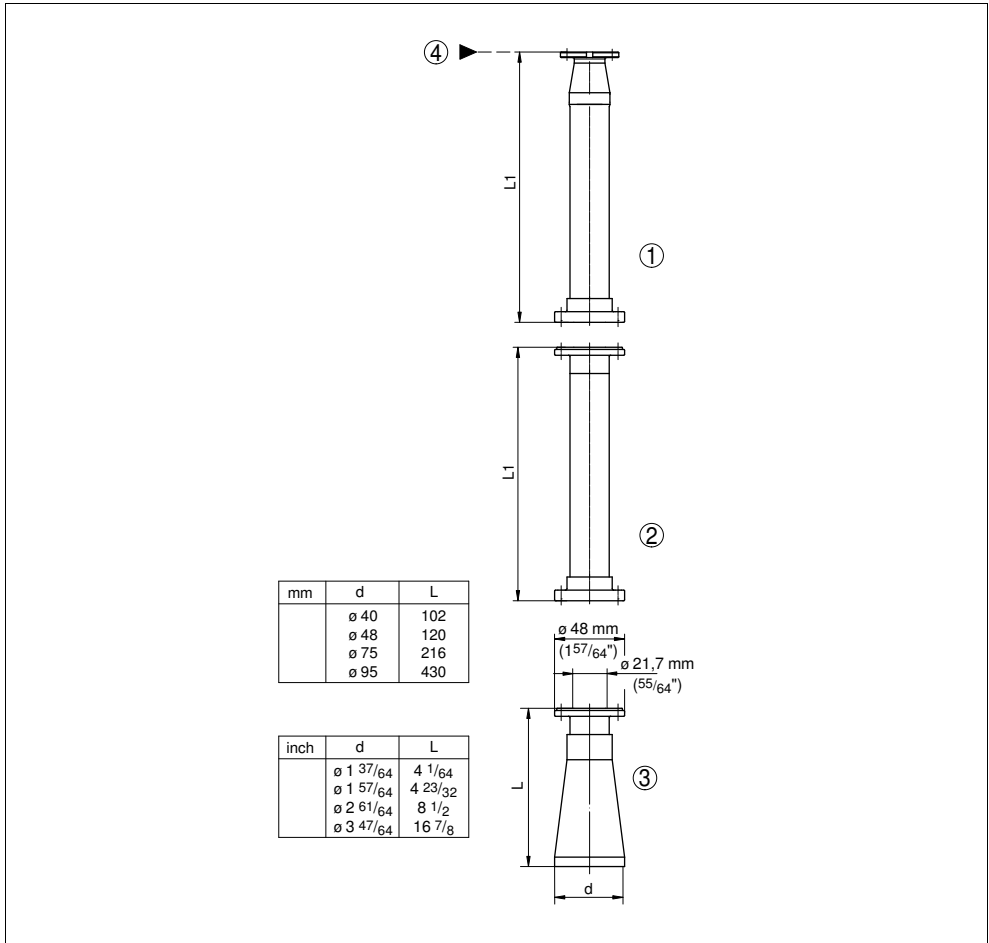
Straight

2 Single angle

3 Double angle

4 Reference plane

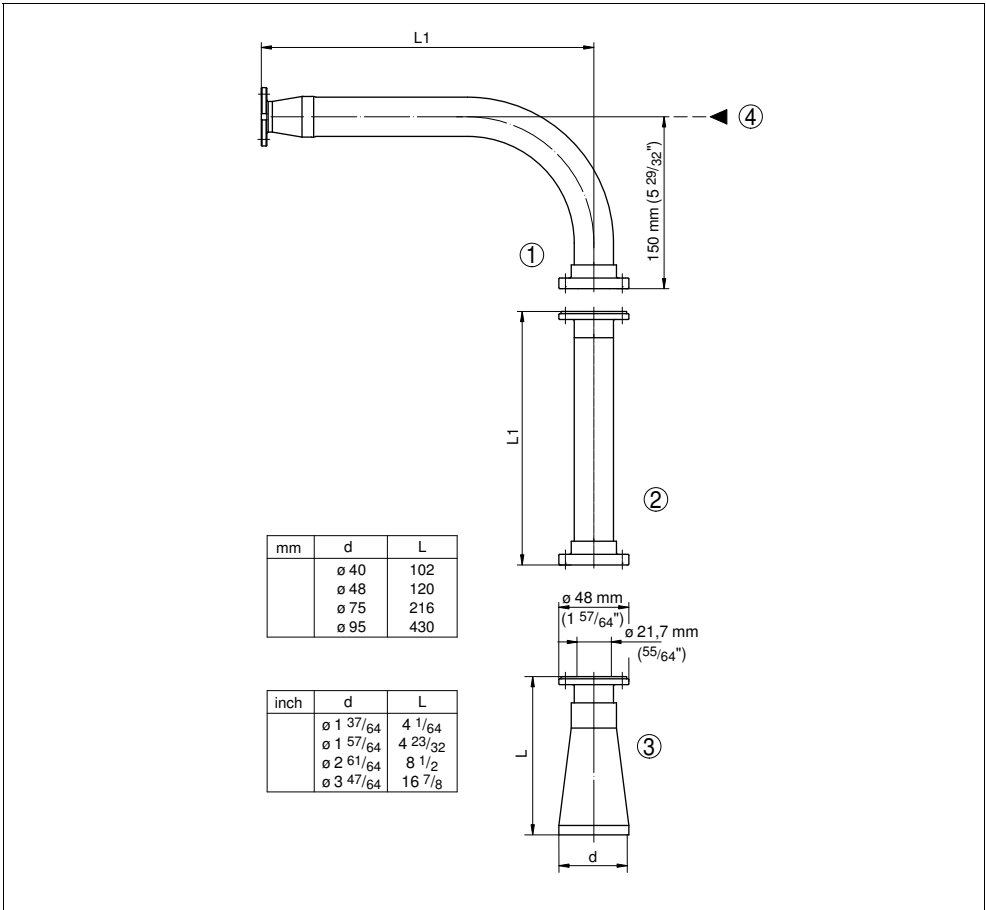
Antenna extension multi-sectional, straight



Extension multi-sectional, straight, unassembled horn antenna, dimensions depending on the order specification₁

- 1 Upper section
- 2 Middle section
- 3 Antenna
- 4 Reference plane

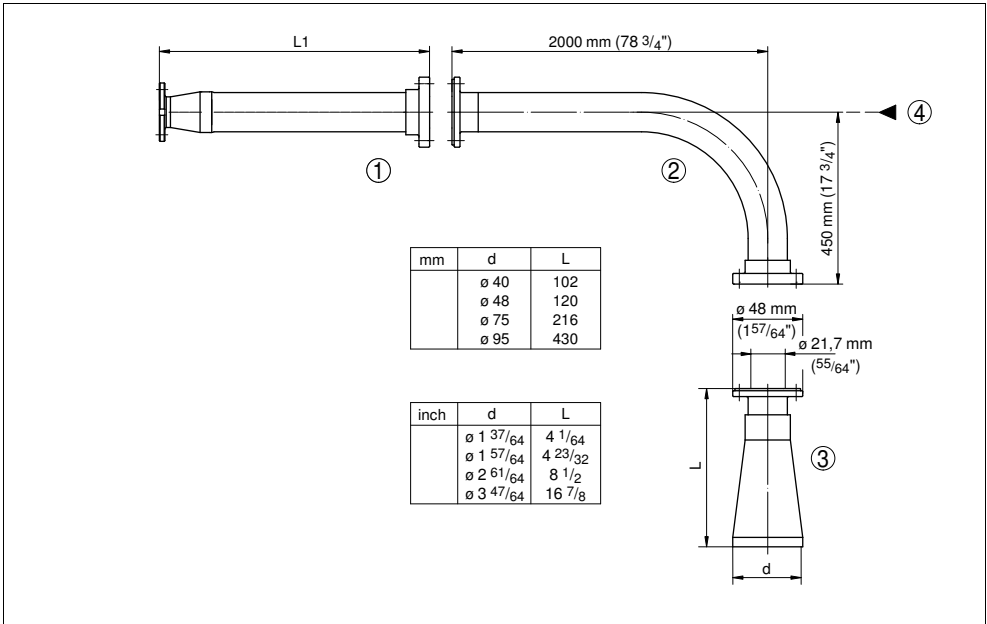
Antenna extension multi-sectional, upper section angled



Extension multi-sectional, upper section angled, unassembled horn antenna, dimensions depending on the order specification¹

- 1 Upper section
- 2 Middle section
- 3 Antenna
- 4 Reference plane

Antenna extension multi-sectional, middle section angled



Extension multi-sectional, middle section angled, unassembled horn antenna

- 1 Upper section
- 2 Middle section
- 3 Antenna
- 4 Reference plane



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