

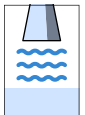
Mounting instructions

Antenna extension

for VEGAPULS 62 and 68



Document ID:
34082



Radar

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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 plant operator.

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

1.2 Appropriate use

The antenna extension is an accessory or retrofit component for VEGAPULS 62 and 68 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.

Using the antenna extension together with rinsing air connection is not permitted in Ex areas.

2 Product description

2.1 Structure

Scope of delivery

The scope of delivery encompasses:

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

Antenna extension, one-piece

This version can be straight, singly angled or doubly angled. It consists of the following components:

- Antenna extension with welded horn antenna
- Rinsing air connection (optional)

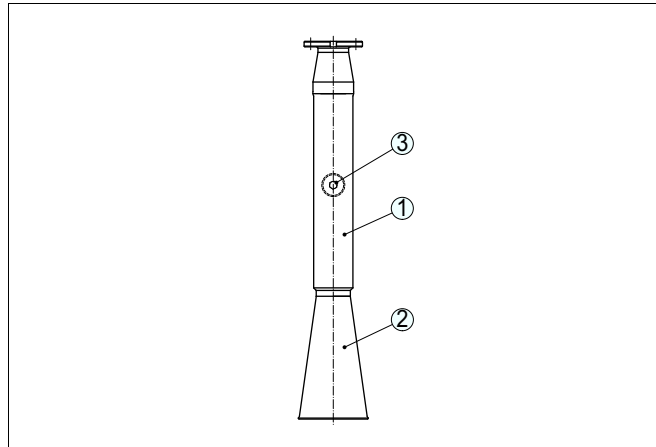


Fig. 1: One-piece extension, straight, with welded horn antenna

- 1 Extension
- 2 Horn antenna
- 3 Rinsing air connection

Antenna extension, multi-sectional

With this version, the upper and middle part can be straight or angled. It consists of the following components:

- Extension multi-sectional, with unassembled horn antenna
- Rinsing air connection (optional)

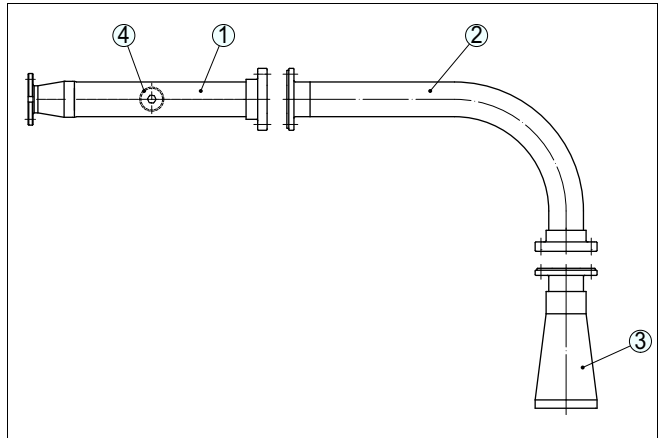


Fig. 2: Extension multi-sectional, upper section straight, middle section angled, unassembled horn antenna

- 1 Upper section
- 2 Middle section
- 3 Horn antenna
- 4 Rinsing air connection

2.2 Principle of operation

Application area

The antenna extension is an accessory or retrofit part for the following radar sensors:

- VEGAPULS 62
- VEGAPULS 68

Typical application areas are vessels with long sockets or installations in the vessel wall.

Functional principle

The antenna extension guides the radar signal to a suitable position for radiating to the product surface. Interfering reflections caused by installations or long sockets are thus avoided.

3 Mounting

3.1 Mounting preparations

Assignment

When the antenna extension is shipped with the radar sensor, calibration is carried out beforehand in the factory. The radar sensor is thus adapted to the antenna extension. To ensure the functioning of the measurement, a correct assignment of the antenna extension to the radar sensor is necessary. For this purpose the antenna parts are marked with the serial number of the sensor.



Note:

An incorrect combination will compromise the accuracy. Make sure that sensor and antenna extension belong together.

Polarisation plane

Electromagnetic radar signals are polarised, i.e. aligned with a certain plane. With angled antenna extensions as well as versions with rinsing air connection, the bending axis must be directed to this polarisation plane. Using the markings on the sensor and the antenna parts, this orientation is easy to carry out. These markings are listed in chapter "Mounting steps".

Support

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

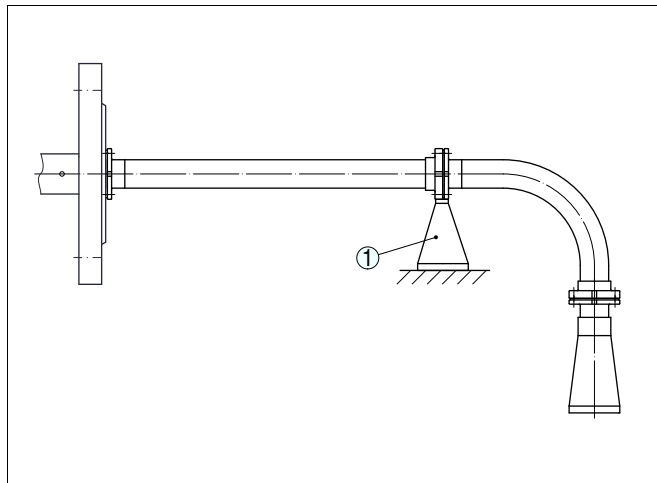


Fig. 3: Absorption of mechanical loads by supports

1 Support

Tools

The following tools are required for mounting:

- Hexagon socket wrench size 4

3.2 Mounting instructions**Gap-free mounting**

Antenna extensions must be mounted not only with mechanical but also microwave-specific considerations in mind. To ensure reliable functioning of the sensors, gap-free mounting of the antenna extension sections in the correct position is necessary.

**Note:**

Gaps, additional seals or holes can cause a great many interfering reflections. Therefore, the mechanical construction of the antenna extension must not be changed. Extending or shortening is not possible.

Orientation

The antenna extension can be rotated at the connection points during assembly. For that reason fasten the parts together with the screws. Tighten the screws only after final orientation.

3.3 Assembly steps, one-part 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 as well as the optional rinsing air connection match

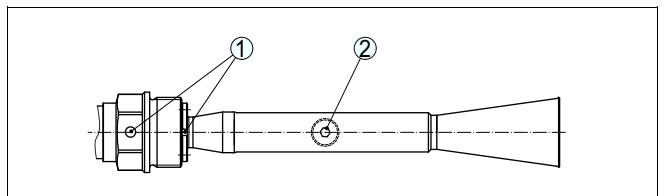


Fig. 4: Position of the polarisation markings with threaded version

- 1 Markings for the polarisation plane
- 2 Rinsing air connection

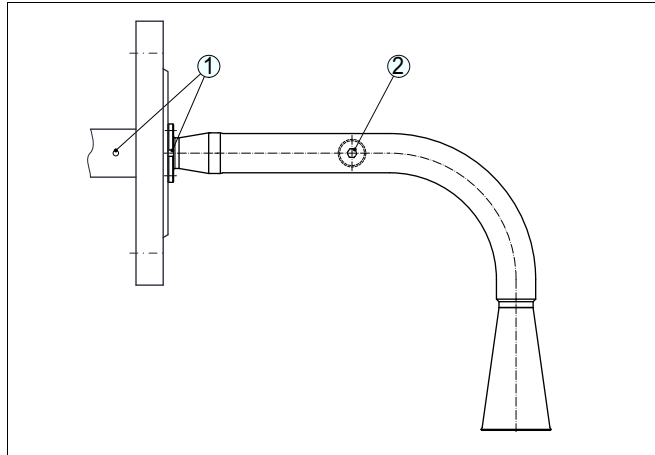


Fig. 5: Position of the polarisation markings with flange version

- 1 Markings for the polarisation plane
 - 2 Rinsing air connection
 - 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)
- Assembly 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 dismantled 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 as well as the optional rinsing air connection are aligned with each other

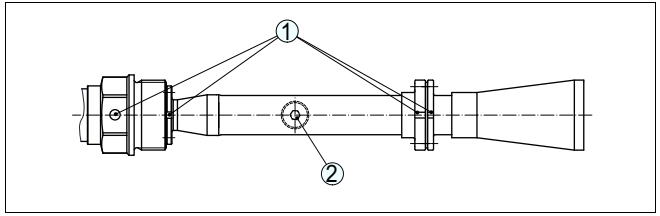


Fig. 6: Position of the polarisation markings with threaded version

- 1 Markings for the polarisation plane
- 2 Rinsing air connection

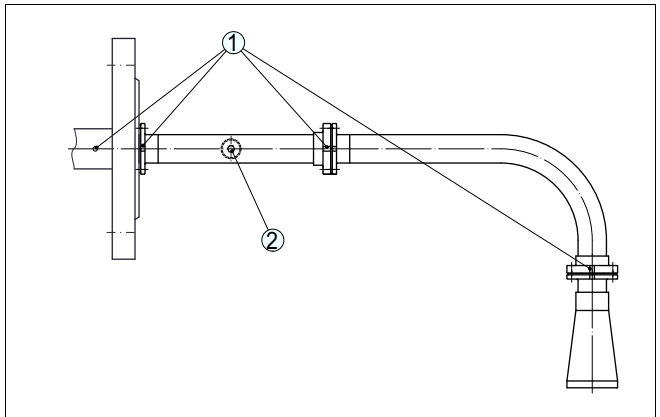


Fig. 7: Position of the polarisation markings with flange version

- 1 Markings for the polarisation plane
- 2 Rinsing air connection
- 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)

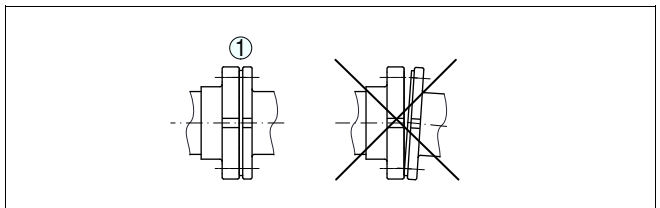


Fig. 8: Connection after tightening the screws

- 1 Correct, gap-free mounting

Assembly is finished.

3.5 Checking the assembly

Angled, multi-sectional or incorrectly mounted antenna extensions in particular 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. Therefore, check sensor and antenna extension for gaps and non-aligned polarisation markings and correct if necessary.

4 Set up

False signal suppression

When the antenna extension is delivered with the radar sensor, a false signal fade-out is carried out beforehand at the factory. False echoes caused by the antenna extension are thus eliminated in the signal processing system.

The false echo curve of a retrofitted antenna extension must be called up and checked via a PC with PACTware. If assembly is correct, the red echo curve will lie directly on top of the blue false echo curve. It is generally recommended that the user carry out a false signal suppression before setup.

Reference plane

When using an antenna extension, the position of the reference plane for the radar measurement changes in some cases. 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
Connection 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

Rinsing air connection

Material, rinsing air connection	316L, Hastelloy C22
Material blind stopper	316Ti
Seal	FKM (Viton)

5.2 Dimensions

Antenna extension, one-piece

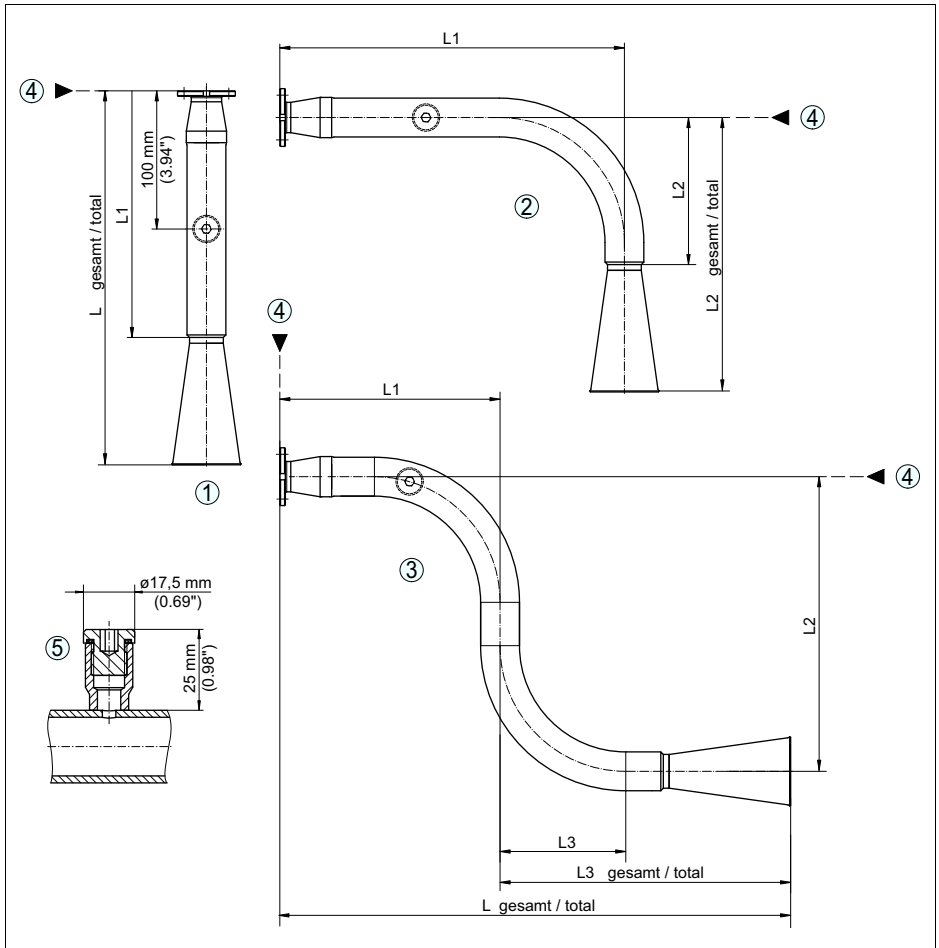


Fig. 9: Extension single-sectional, welded horn antenna, dimensions depending on the order specification

- 1 Straight
- 2 Singly angled
- 3 Doubly angled
- 4 Reference plane
- 5 Rinsing air connection

Antenna extension multi-sectional, straight

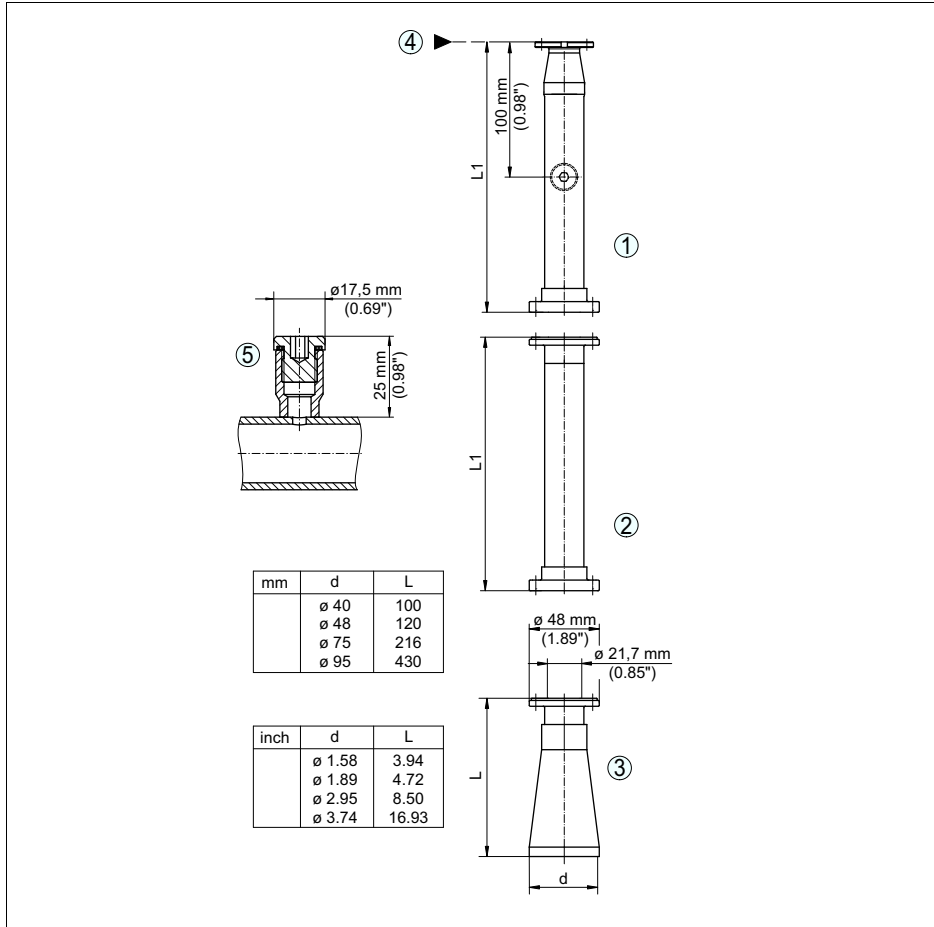


Fig. 10: Extension multi-sectional, straight, unassembled horn antenna, dimensions depending on the order specification

- 1 Upper section
- 2 Middle section
- 3 Antenna
- 4 Reference plane
- 5 Rinsing air connection

Antenna extension multi-sectional, upper section angled

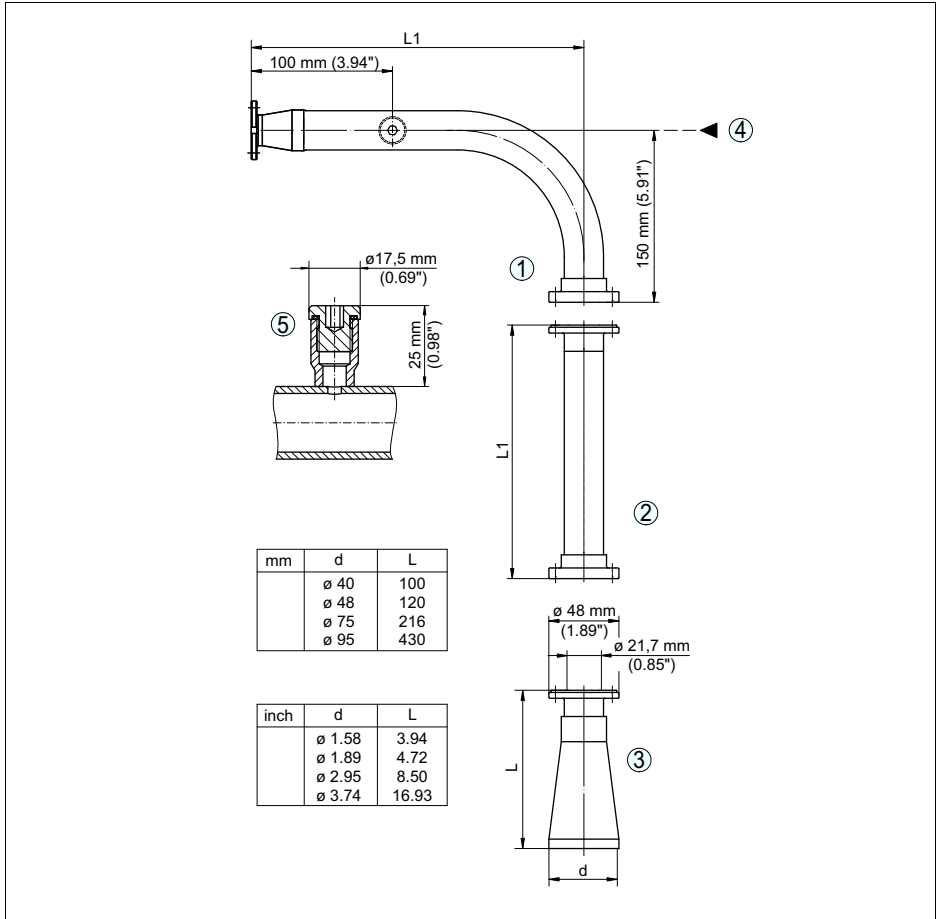


Fig. 11: Extension multi-sectional, upper section angled, unassembled horn antenna, dimensions depending on the order specification

- 1 Upper section
- 2 Middle section
- 3 Antenna
- 4 Reference plane
- 5 Rinsing air connection

Antenna extension multi-sectional, middle section angled

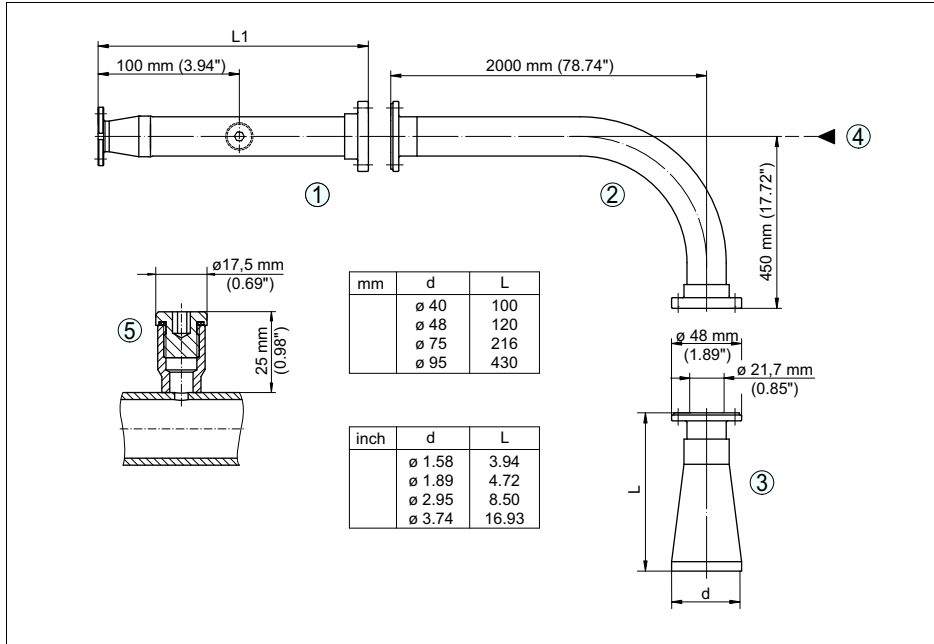


Fig. 12: Extension multi-sectional, middle section angled, unassembled horn antenna

- 1 Upper section
- 2 Middle section
- 3 Antenna
- 4 Reference plane
- 5 Rinsing air connection



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VEGA Grieshaber KG
Am Hohenstein 113
77761 Schiltach
Germany
Phone +49 7836 50-0
Fax +49 7836 50-201
E-mail: info@de.vega.com
www.vega.com



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