Flow indicator for bulk solids FTR20

- The FTR20 flow indicator for bulk solids is a non-contact device based on microwave technology. It is ideally suited for monitoring pneumatic and mechanical transport processes for bulk solids.
- The compact device can be used wherever the cost-effective monitoring of bulk solids movement is required.
- Typical areas of application or bulk solids are:
  • Building materials industry: Cement, plaster, wood chips etc.
  • Chemical industry: Fertilizers, plastic powder, granules etc.
  • Food industry: Coffee, tea, tobacco, cereals, malt etc.
  • Energy production: Coal, carbon dust, fly-ash, coke etc.
- Individual adjustments to the application are carried out by means of configurable functions (including automatic calibration). In addition, changes in the mass flow can be analyzed by the optional 4 - 20 mA current output.
- Detection range up to 20 m depending on the bulk solids
- Process temperatures up to +70°C (+158°F) or +450°C (+842°F) with optional high temperature adapter
- Process pressure up to 680 kPa (6.8 bar) absolute or 2000 kPa (20 bar) absolute with optional high pressure adapter
- For use in hazardous areas (dust 1/2D): ATEX, CSA, EAC and IECEx
- Compact device: Sensor, transmitter and power unit are mounted in a housing, which means less effort is required for installation and mounting.
- The device can be used wherever cost-effective monitoring of a mass flow (present or not present) is required.
- Flush-mounted installation, non-contact installation possible
- Easy mounting using R 1½, 1½ NPT or G 1½ thread or a suitable mounting bracket
- Electronics housing can be rotated by 360°, allowing orientation into optimum position after installation
- Easy electrical connection using the connectors (optional with suitable mating connectors or prefabricated connection cables)

Table of contents

Function and system design

Measuring principle

The FTR20 flow indicator for bulk solids works using microwave technology. A signal is transmitted, and this signal is reflected by the moving bulk solids. The FTR20 measures the strength of the reflected, frequency-shifted (Doppler effect) energy, this is analyzed and put out via the display or the signal output.

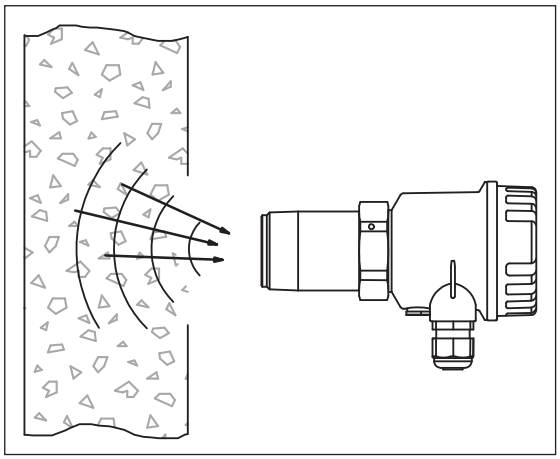


Figure 1: Measuring principle

The range of the FTR20 depends on the reflection characteristics of the bulk solids.

Example of volumetric dosing

The FTR20 monitors the outflow of a screw conveyor. If the flow of material slows down (for example due to clogging of the pipe leading downwards or if there is no material being conveyed due to a failure in the screw conveyor), the device generates a message to this effect. This can then be processed further in the system.

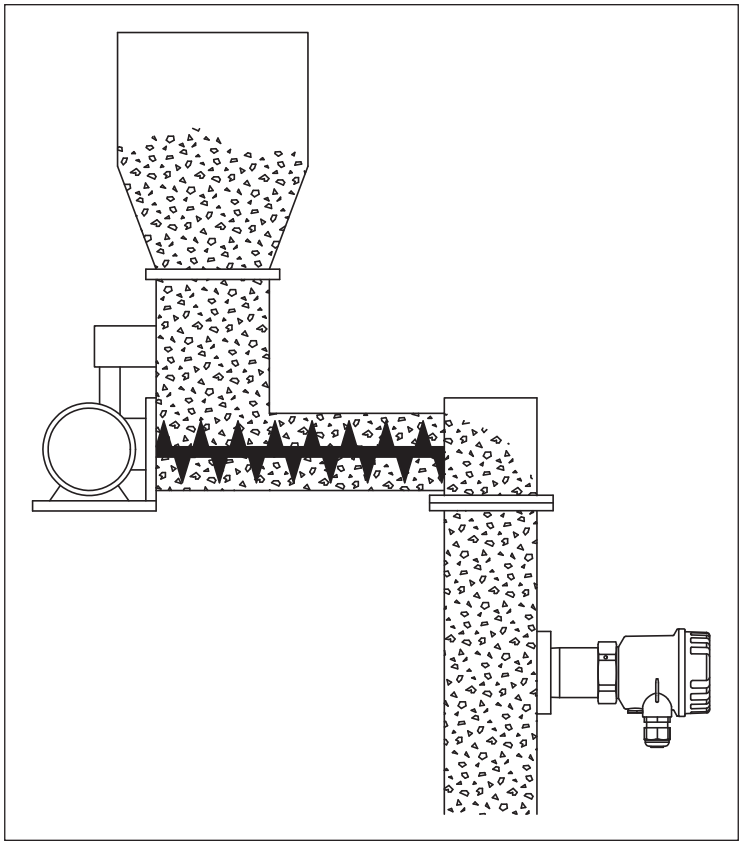


Figure 2: Example of volumetric dosing

Example of a conveyor belt

The FTR20 monitors the continuous mass flow at a transition point, a break in the flow is detected and put out at the signal output.

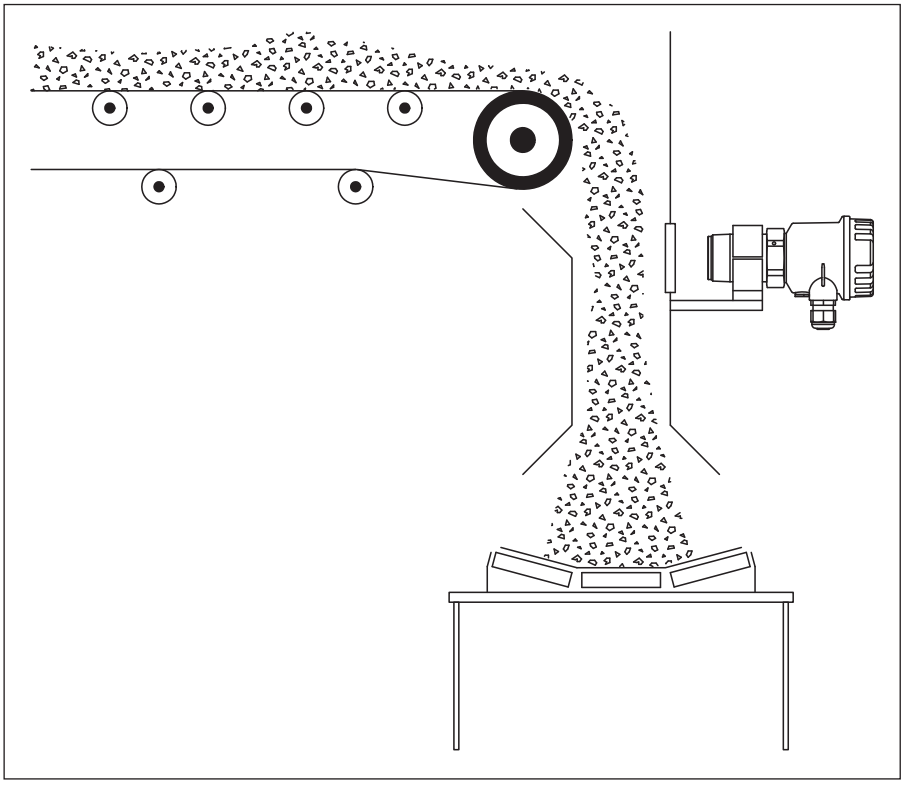


Figure 3: Example transition point monitoring

The FTR20 monitors if there is material on the conveyor belt.

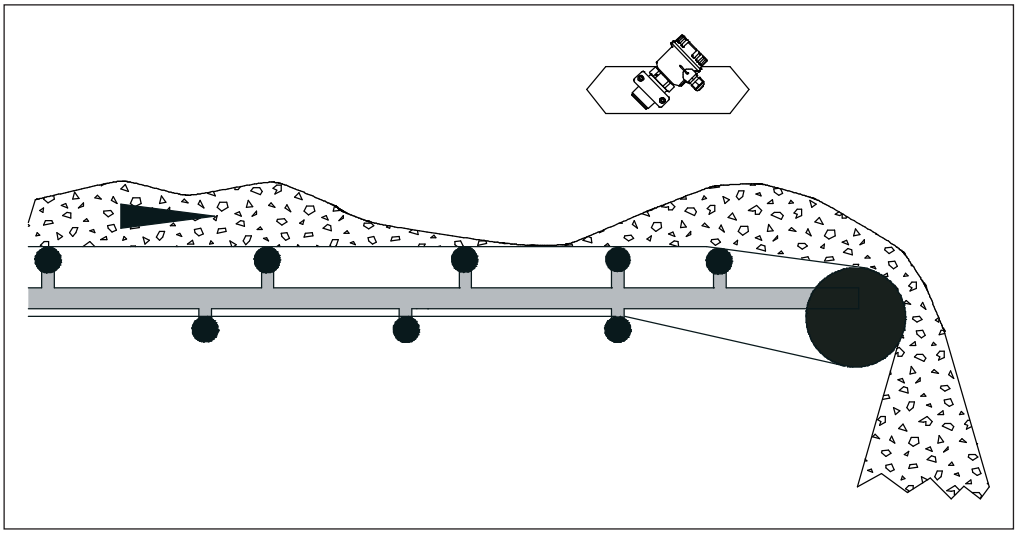


Figure 4: Example conveyor belt monitoring

Notice!
For optimal installation in the process, the FTR20 devices can be extended with corresponding accessories such as weld-in nozzles, sight glasses or high temperature adapters for process separation (→ page 33).

Safety

We shall only grant a guarantee if the device is installed and operated in accordance with the Operating Instructions. Safety measures in accordance with the user's safety standard, which provide additional protection for the device and its signal transfer, are to be implemented by the user.

Safety instructions: General

- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
  - Be suitably qualified for their role and the tasks they perform
  - Be trained in explosion protection
  - Be familiar with national regulations (e.g. EN 60079-14)
- Install the device according to the manufacturer's instructions and any other valid standards and regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.
- Only install the devices in media for which the wetted materials have sufficient durability.
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Kirchgaesser.

Safety instructions: Special conditions

Permitted ambient temperature range at the electronics housing:
-40°C (-40°F) ≤ Ta ≤ +70°C (+158°F)

Safety instructions: Installation

- Comply with the installation and safety instructions in the Operating Instructions.
- Install the device according to the manufacturer's instructions and any other valid standards and regulations (e.g. EN 60079-14).
- Pay attention to the maximum process conditions according to the manufacturer's Operating Instructions.
- To maintain the ingress protection of the housing IP66, install the housing cover and cable glands correctly.
- Seal unused entry glands with approved sealing plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation.
- Only rigidly laid lines and cables may be inserted. The operator must ensure corresponding strain relief.
- The maximum thermal load of the inserted lines and cables is to be observed.
- Signal output for connection to uncertified circuits with the following maximum values:
  - Potential-free relay contact:
    U~ max. 250 VAC, I~ max. 4 A or
    U= max. 125 VDC, I= max. 0.4 A or
    U= max. 30 VDC, I= max. 4 A
  - Current output:
    I = 4 - 20 mA, RL ≤ 600 Ω
  - Solid-state relay:
    U~ max. 30 VAC, I~ max. 0.4 A or
    U= max. 40 VDC, I= max. 0.4 A
- During operation, the cover must be screwed all the way in and the cover's safety catch must be fastened.

Safety instructions: Zone 20

- Only operate devices in potentially explosive vapour/air mixtures under atmospheric conditions:
  - Temperature: -40°C (-40°F) to +70°C (+158°F)
  - Pressure: 50 kPA (0.5 bar) to 680 kPA (6.8 bar)
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, according to EN 1127-1, the transmitters may be operated under other atmospheric conditions in accordance with the manufacturer's specifications.
- Only install the devices in media for which the wetted materials have sufficient durability (e.g. process connection seal).

Safety instructions: Valid documentation

Available certifications → page 31

Input

Measured variable	Doppler frequency
Measuring range (detection range)	With an unobstructed radiation path to the surface of the bulk solids, the maximum range is 20 m depending on bulk solids (reflection characteristics). This is reduced if container walls, sight glasses or similar need to be penetrated.
Operating frequency	24.15 GHz ± 80 MHz
Transmitting power	The power produced by the FTR20 is maximum 100 mW e.i.r.p. (equivalent isotrope radiation performance). • Power density directly in front of the device: Approx. 1 mW/cm^2 • Power density at a distance of 1 m: Approx. 0.3 µW/cm^2 Notice! The power density is clearly below the recommended limit values of the ICNIRP guidelines "*Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz)*" and thus is completely harmless for humans.
Switching frequency	max. 2 Hz
Antenna opening angle (3 dB)	approx. ± 11°
Detectable speed	0.09 ... 62 m/s

Output

Terminal and connector assignment

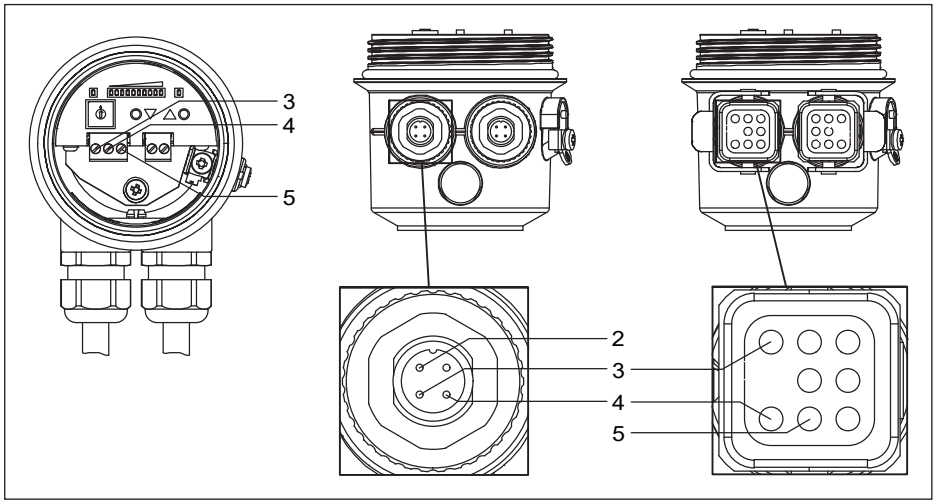
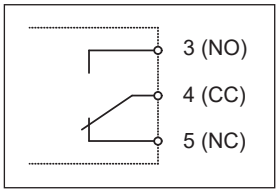


Figure 5: Terminal and connector assignment of the signal output

Relay

- Potential-free change-over contact
- Switching capacity:
  250 VAC / 4 A (Harting connector type HAN8D max. 50 VAC), 125 VDC / 0.4 A or 30 VDC / 4 A
- Contact material: AgCdO (gold-flashed)
- Switching frequency: max. 2 Hz

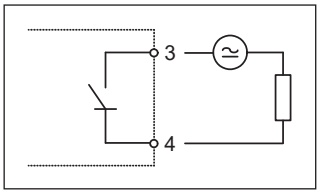


Electrical connection	Relay		
Connection terminals	Terminal 3 (NO)	Terminal 4 (CC)	Terminal 5 (NC)
M12 connector (Binder series 713/763)	Connector 2		
	Contact 2 (NO)	Contact 3 (CC)	Contact 4 (NC)
Harting connector type HAN8D	Connector 2		
	Contact 3 (NO)	Contact 4 (CC)	Contact 5 (NC)

Notice!
- The contact material is also suitable for switching small signal circuits. However, this is possible only if no inductive loads or higher currents have been switched previously.
- The solid-state relay can be used to evaluate higher switching frequencies.

Solid-state relay

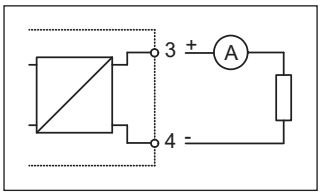
- Switching contact of a semiconductor relay
- Switching capacity:
  30 VAC / 0.4 A or 40 VDC / 0.4 A
- Switching frequency: max. 2 Hz



Electrical connection	Solid-state relay
Connection terminals	Terminal 3 − 4
M12 connector (Binder series 713/763)	Connector 2, contact 3 − 4
Harting connector type HAN8D	Connector 2, contact 3 − 4

Current

- Current output 4 ... 20 mA
- Active
- Max. load: 600 Ω



Electrical connection	Stromausgang
Connection terminals	Terminal 3 (+) − 4 (−)
M12 connector (Binder series 713/763)	Connector 2, contact 3 (+) − 4 (−)
Harting connector type HAN8D	Connector 2, contact 3 (+) − 4 (−)

Notice!
The value of the current output corresponds to the signal strength.

Power supply

Terminal and connector assignment

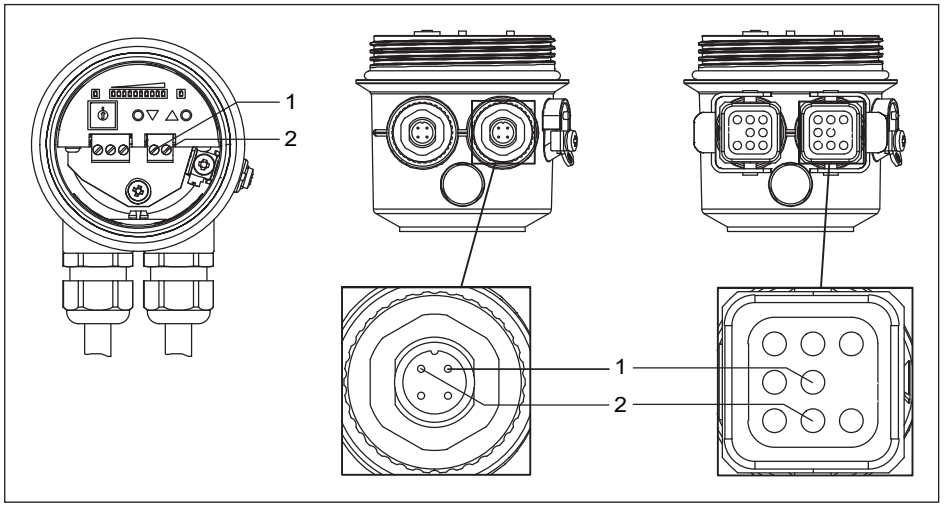


Figure 6: Terminal and connector assignment of the power supply

Electrical connection	Power supply
Connection terminals	Terminal 1 − 2
M12 connector (Binder series 713/763)	Connector 1, contact 1 − 2
Harting connector type HAN8D	Connector 1, contact 1 − 2

A suitable wire (→ page 10) is used to connect the FTR20 to the power supply.

Supply voltage

- 85 ... 253 VAC, 50/60 Hz
- 20 ... 60 VDC or 20 ... 30 VAC, 50/60 Hz

Notice!
- The polarity of the supply voltage can be set as required.
- When using the public powers supply, install an easily accessible power switch in the proximity of the instrument. Mark the power switch as a disconnector for the instrument (EN/IEC 61010).
- You should use a fuse to protect the power supply against short-circuit.
- The electrical connection with Harting connector type HAN8D is only available for the power supply with 20 ... 60 VDC or 20 ... 30 VAC, 50/60 Hz.

Power consumption

- max. 4.8 VA (85 ... 253 VAC, 50/60 Hz)
- max. 2.2 W (20 ... 60 VDC) or 3 VA (20 ... 30 VAC, 50/60 Hz)

Potential equalization

Requirements:
- The potential equalization should be connected to the outer ground terminal.
- For optimum electromagnetic compatibility, the potential matching line should be as short as possible.
- The recommended minimum cable cross-section is 2.5 mm^2.
- Potential equalization of the FTR20 should be incorporated in the local potential equalization.

Notice!
For devices intended for use in hazardous locations, please observe the safety instructions (→ page 5).

Terminals

Max. 1.5 mm^2

Cable entries

- Cable gland M20 x 1.5 or cable entry ½ NPT
- Degree of protection: Min. IP66
- Cable gland for non-hazardous areas:
  - Material: Plastic
  - Color: Gray
  - Clamping range: 5 to 10 mm (EN 61444) or 7 to 10 mm (UL-514 B)
- Cable gland for hazardous areas:
  - Material: Nickel-plated brass
  - Color: Silver
  - Clamping range: 7 to 10.5 mm
- Quantity: 2 pieces per device

Notice!
The cable gland is only admissible for the connection of fixed-installation lines and cables. The operator must ensure corresponding strain relief.

Device connector

- M12 connector (Binder series 713/763)
- Harting connector type HAN8D

Notice!
- Suitable mating connectors are available as an order variant (→ page 30).
- Suitable mating connectors and prefabricated connection cables are available as accessories (→ page 33).

Cable specification

- Normal installation cable is sufficient
- Conductor cross-section: max. 1.5 mm^2

Performance characteristics

Reference operating conditions

Every application is different in terms of its shape (such as influential reflexion edges), medium as well as the properties of the medium (such as attenuation and moisture levels) and therefore always requires an individual basic setup of the flow indicator.

Influence of ambient temperature

The ambient temperature has no direct influence on the measuring system (FTR20 is temperature-compensated internally).

Influences on bulk flow detection

Distance of FTR20 from the medium

The measuring signal is influenced by the distance between the device and the medium. With significantly deviating distances, the device should be installed, if possible, such that the distance is as constant as possible. If this is not possible, the flow indicator must be adjusted under the least favourable conditions in this case too.

Vibration effects

Vibration resistance – continuous load with sliding frequency in accordance with EN 60068-2-6:
- -40 to +80°C (-40 to +176°F)
- Excitation: Sine
- Frequency range: 10 to 55 Hz
- Amplitude: 0.75 mm
- Throughput speed: 1 octave per minute
- Test axes: Three directions (X, Y, Z)
- Number of frequency cycles: 20 per axis
- Test duration: Approx. 1 h 38 min per axis
- Test temperature: Room temperature

Installation

Mounting location

The mounting location must be selected such that application-specific influences are minimized (→ page 11).

Notice!
- Mechanical protection of the devices (such as protection against larger falling product pieces) should be taken into account.
- Depending on the installation locations, different process adapters are available as accessories (→ page 33).
- For devices intended for use in hazardous locations, please observe the safety notes.

Orientation

Any orientation is possible for the FTR20 flow indicator. However, a small angle **α** may increase the signal quality. We recommend an angle of 45° for material detection on conveyor belts (→ page 4).

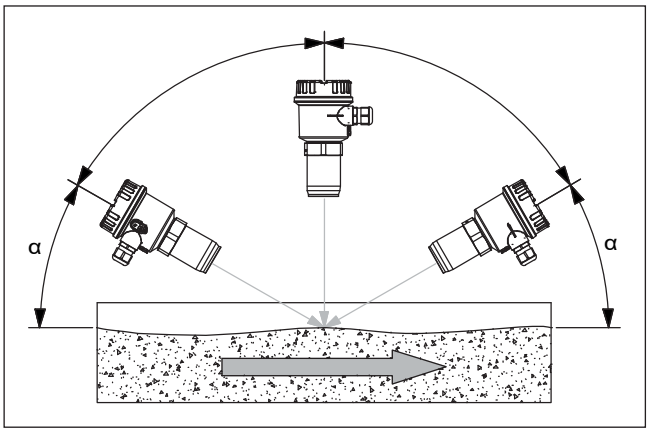


Figure 7: Orientation

Installation instructions

The FTR20 flow indicator comes with a standard thread (R 1½ as per EN 10226, 1½ NPT as per ANSI/ASME B1.20.1 or G 1½ as per ISO 228-1) as a process connection. This enables easy installation in existing container couplings or nozzles. For optimal orientation after installation in the process, the electronics housing can be rotated as desired (by 360°).

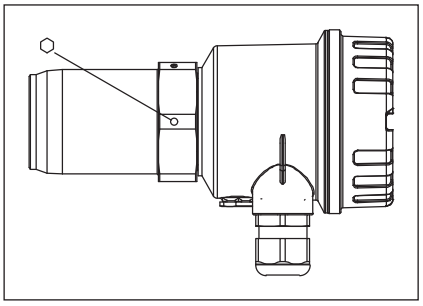


Figure 8: Fixing the electronic housing

Following installation, the housing must be secured using the Allen head screw (2.5 AF).

Installation with self-sealing connection thread (R 1½ and 1½ NPT)

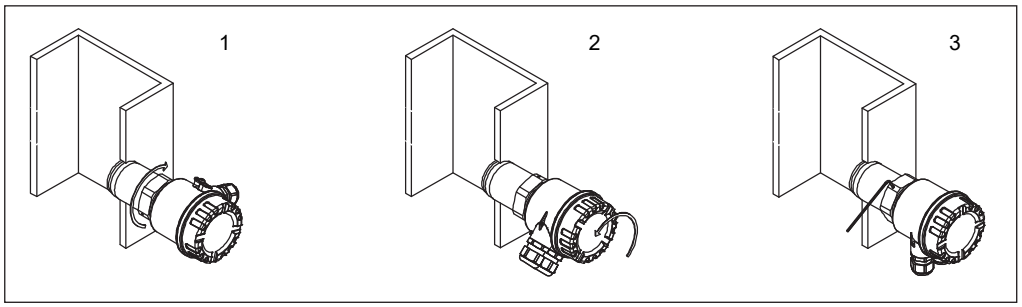


Figure 9: Installation with self-sealing connection thread

1. Turn self-sealing connection thread R 1½ or 1½ NPT into the process (SW55 hexagon).
2. Align electronic housing.
3. Secure the housing (2.5 mm hex socket).

Installation with non-self-sealing connection thread (G 1½)

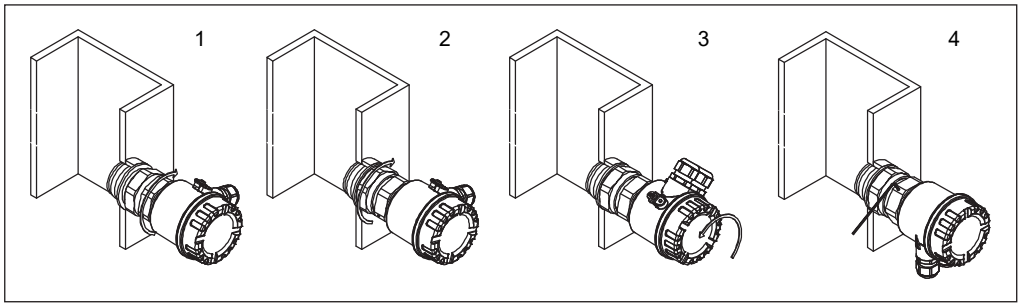


Figure 10: Installation with non-self-sealing connection thread

1. Screw non-self-sealing connection thread G 1½ with the enclosed process seal into the process (hexagon 55 AF).
2. Tighten the counter nut of the thread (also hexagon 55 AF).
3. Align electronic housing.
4. Secure the housing (2.5 mm hex socket).

Notice!
- If the process connection is not screwed far enough into the process wall, there is a risk that material will accumulate in front of the FTR20 and cause attenuation of the microwave signal.
- If, on the other hand, the process connection is screwed too far into the process, there is a risk of damage due to large falling product pieces.

Direct mounting with threaded connection

The simplest mounting method is by screwing into the process wall. To do this, a corresponding internal thread (Rp 1½, 1½ NPT or G 1½) must be available in the process.

Notice!
- Weld-in adapters of type FAR52-A*, with corresponding internal thread, are available as accessories.
- If the internal threads available in the process wall are different (R 2 to R 4 or 2 NPT to 4 NPT), additional screw-in adapters of type FAR52-B* are available as accessories.
- Accessories → page 35

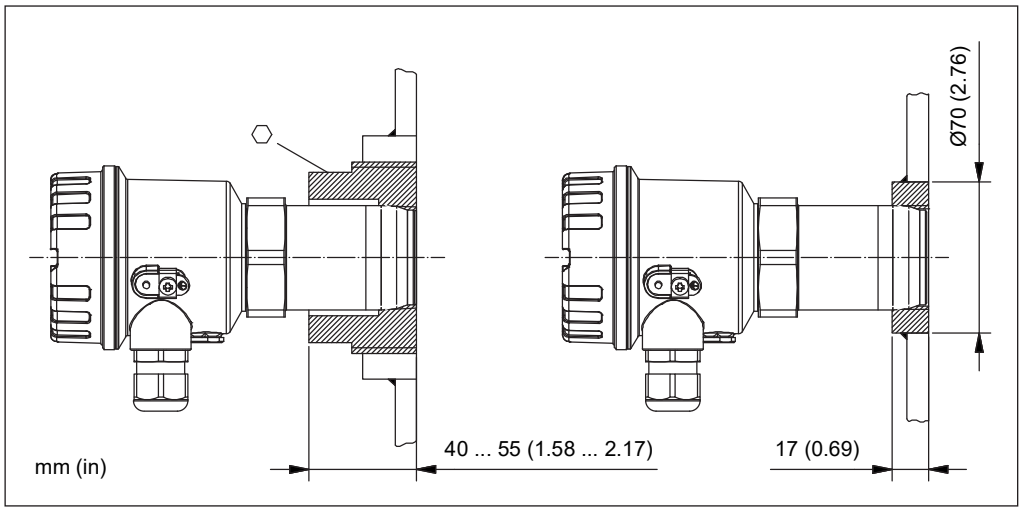


Figure 11: FAR52 weld-in or screw-in adapter

With direct mounting in the process wall, it must be ensured that the front edge of the process connection is flush with the internal edge.

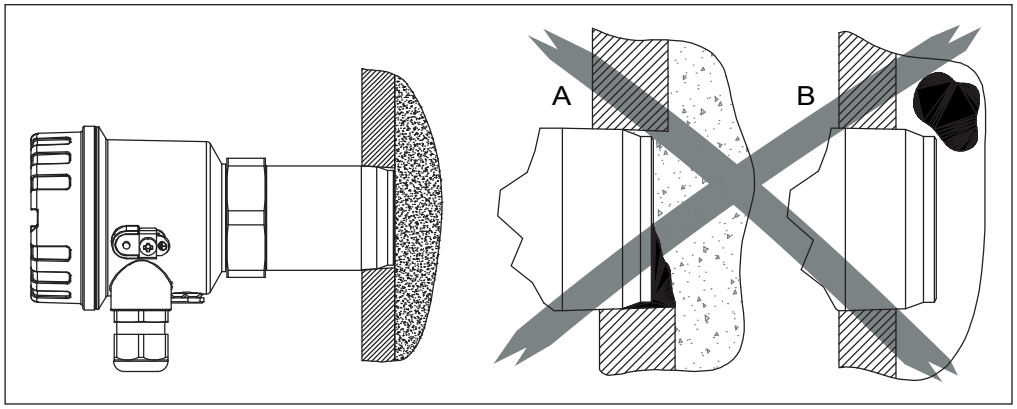


Figure 12: Direct mounting with threaded connection

Notice!
- If the process connection is not screwed far enough into the process wall (**A**), there is a risk that material will collect in front of the FTR20 and cause attenuation of the microwave signal.
- If, on the other hand, the process connection is screwed too far into the process (**B**), there is a risk of damage due to large falling product pieces.
- When using the G 1½ -process connection (standard thread to ISO 228-1, hexagon 55 AF) with integrated counter nut, the devices can be flush mounted especially easily, as a parallel thread is used.

For applications with a high process pressure up to 2 MPa (20 bar) absolute, we recommend the following high pressure adapter (accessories → page 36).

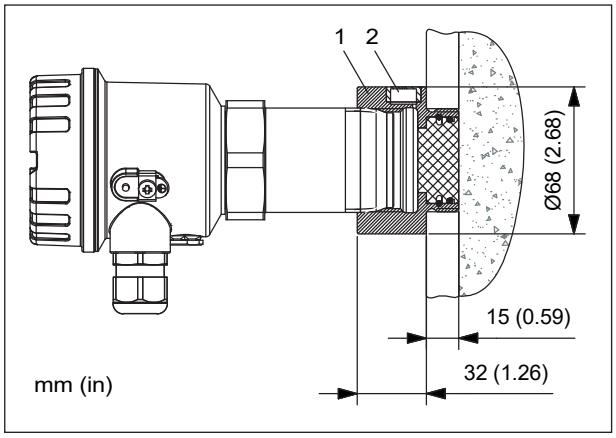


Figure 13: Mounting with high-pressure adapter

Notice!
The maximum temperature at the FTR20 must be observed.

Mounting in front of microwave-impermeable process wall

If, due to the process conditions (such as high temperatures, high pressures or hazardous nature of the material), no direct installation in the microwave-impermeable process wall is possible, the flow indicator can emit its signal through an additionally installed plug.

The following materials have been tested and are suitable for radiation:
- Plastics (virginal, unfilled) such as polytetrafluorethylene (PTFE), polyethylene (PE) or polypropylene (PP)
- Aluminum oxide ceramic (purity min. 99.5 %, uncolored)
- Borosilicate glass (uncolored)

Notice!
Colorations or added (colored) substances can cause a potentially high signal attenuation, depending on the material, and are therefore not suitable for this purpose.

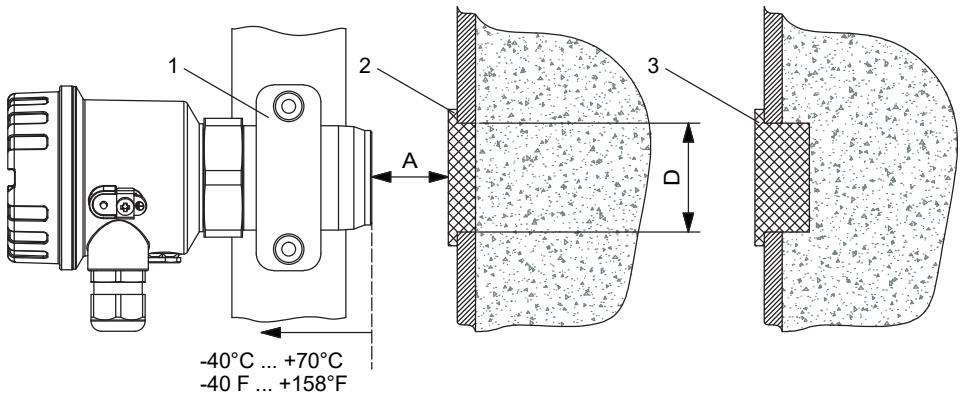


Figure 14: Bracket mounting in front of a microwave-impermeable process wall

1 Bracket
2 Microwave-permeable plug
3 Microwave-permeable plug on formation of condensate on the inner wall

Notice!
- With bracket mounting in front of a microwave-permeable plug and the risk of the formation of condensate on the inner wall of the container, we recommend a plug protruding into the process.
- The maximum temperature at the FTR20 must be observed.
- Distance **A** is based on the free transition area **D**. To prevent possible signal attenuation, we recommend keeping the distance as short as possible (e.g. max. 40 mm at DN50).
- Suitable mounting brackets made of plastic or aluminum are available as accessories (→ page 33).
- Suitable plugs made of PTFE or aluminum oxide ceramic of type FAR54 are available as accessories in different lengths and diameters (→ page 36).

Mounting in front of microwave-permeable sight glass fitting

If the process wall is not permeable, it is possible to have the flow indicator emit its signal from outside through a suitable sight glass fitting. The sight glass in this fitting is made of uncolored borosilicate glass.

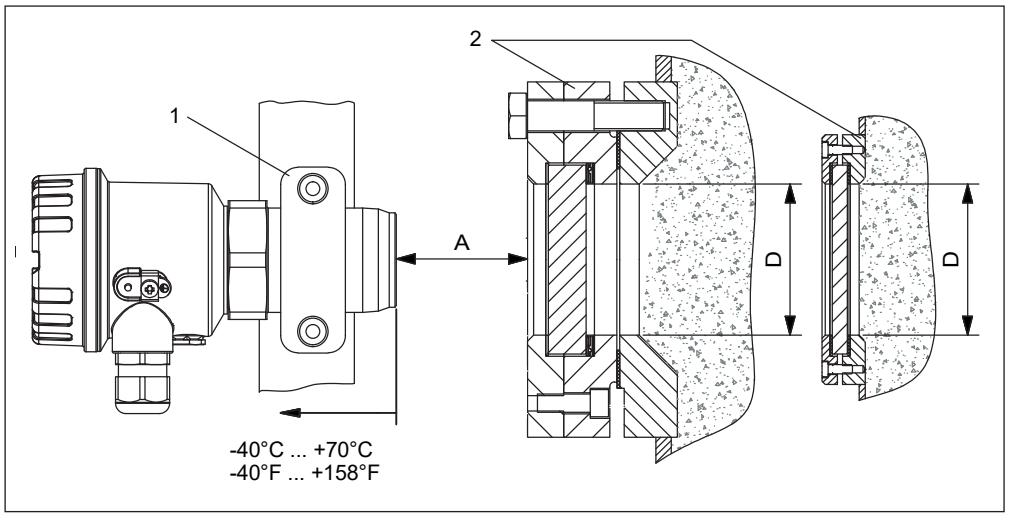


Figure 15: Bracket mounting in front of microwave-permeable sight glass fitting

1 Mounting bracket
2 Sight glass

Notice!
- Distance **A** is based on the free transition area **D** and the temperature in this area. To prevent possible signal attenuation, we recommend keeping the distance as short as possible (e.g. max. 40 mm at DN50).
- Sight glass fittings should in principle only be installed at places where no material can collect on the process side (danger of faulty measurements).

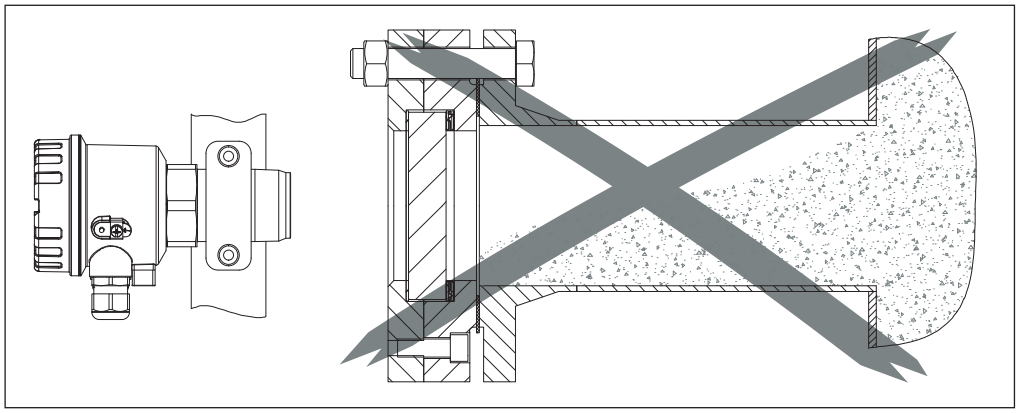


Figure 16: Impermissible mounting with the risk of material collection

Notice!
- Suitable mounting brackets made of plastic or aluminum are available as accessories.
- Suitable sight glass fittings made of stainless steel with borosilicate glass are available as accessories
- Accessories → page 33

Mounting on process nozzles

Mounting on a process nozzle offers the following advantages:
- By using available nozzles, no modifications of the process are required.
- The use of suitable plugs can prevent material from collecting in the nozzle.
- At the same time, the plug acts as wear protection for the flow indicator and can be replaced easily in the event of significant wear.
- Mounting or disassembly of the FTR20 devices can be carried out during ongoing operation, which significantly simplifies the service process.

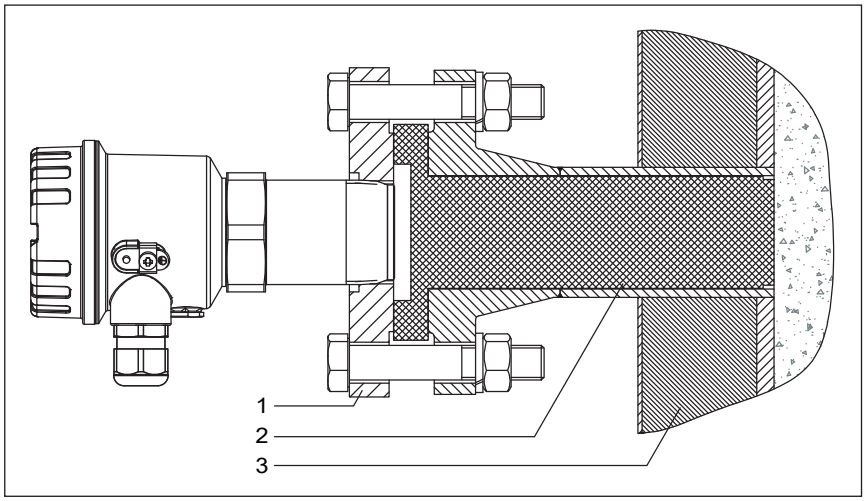


Figure 17: Mounting on available process nozzles

1 Mounting flange
2 Plug
3 Process insulation

Notice!
- Suitable mounting flanges with corresponding connection threads made of stainless steel and plugs made of PTFE or aluminum oxide ceramic of type FAR54 for the available process nozzles are available as accessories.
- Process nozzles of type FAR50, consisting of connection nozzle, plug and mounting flange, are available as accessories in different sizes and materials.
- For non-vertical process walls, we recommend mounting the process nozzle far enough into the process that no material can collect in front of it (**A**) (→ page 18).
- For process nozzle mounting and when there is a risk of material building up on the inner wall of the container, we recommend a nozzle that protrudes into the process (**B**).
- The maximum plug length is dependent on the attenuation and water absorption of the material. Please note the manufacturer's instructions in this regard.

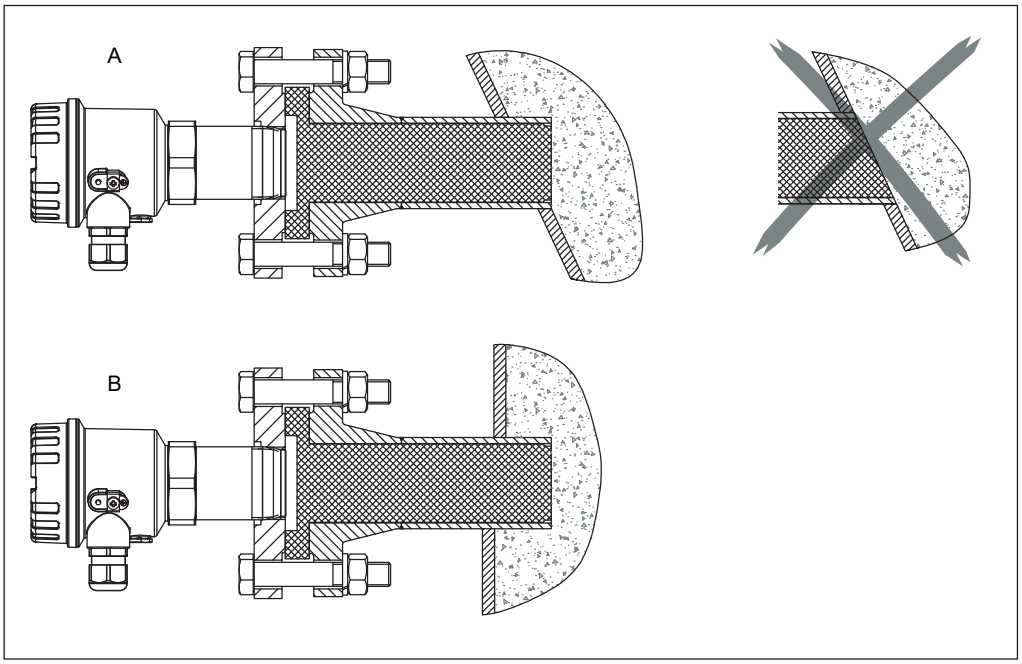


Figure 18: Mounting with the risk of accumulations

Notice!
When there is a risk of condensate forming between the process connection of the FTR20 and the plug, we recommend using the process nozzle type FAR50 (→ page 40), which is equipped with a mounting flange with a pressure equalization element.

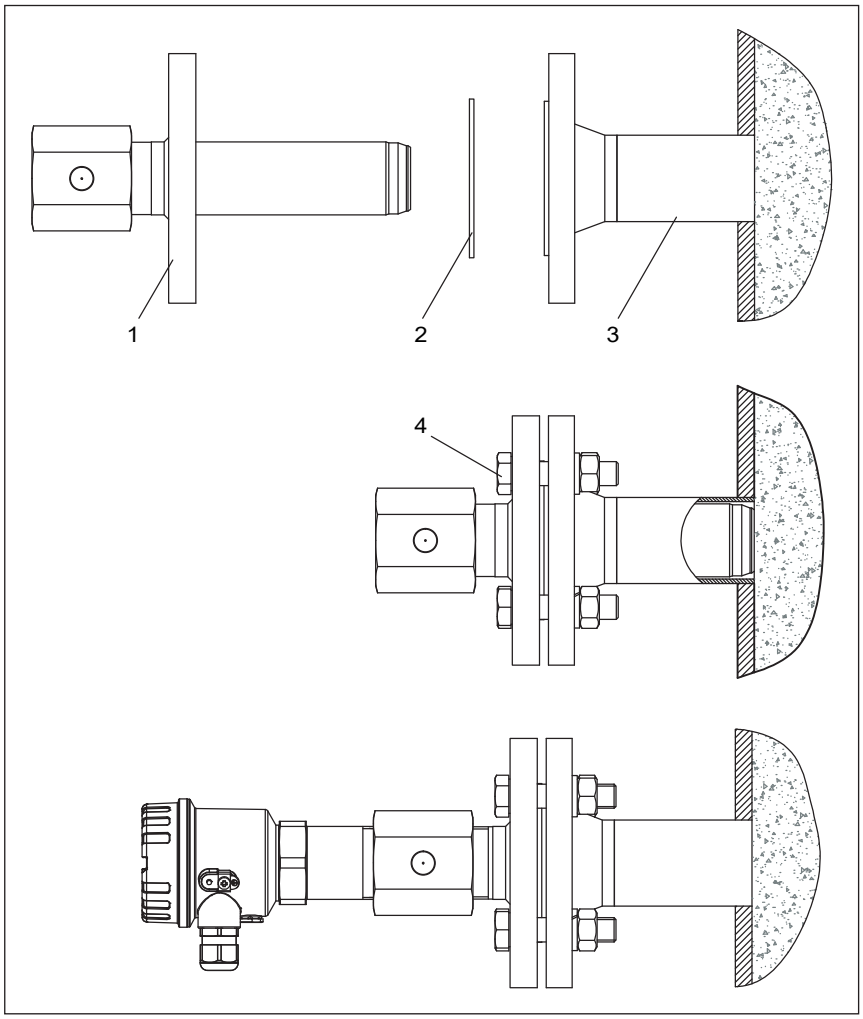


Figure 19: Mounting with FAR51 insertion adapter

1 Insertion adapter
2 Customer-supplied gasket
3 Process nozzle
4 Customer-supplied installation material

Notice!
For process temperatures of +70 to +450°C (+158 to +842°F), plug-in adapters for stainless steel flange nozzles of type FAR51 are available as accessories (→ page 40).

Mounting with spacer tube (wave guide)

For many processes, mounting with a spacer tube is a simple and cost-effective way of separating the devices of the FTR20 flow indicator from the high process temperatures of +70 to +450°C (+158 to +842°F). The spacer tube can be secured in place in various ways, depending on the application conditions (e.g. screwed into the process wall, bolted-on mounting brackets, welded or clamped to available cross beams).

We also recommend this mounting method for processes that are lined with clay or similar materials on the inside. The spacer tube can be glued into place, for example.

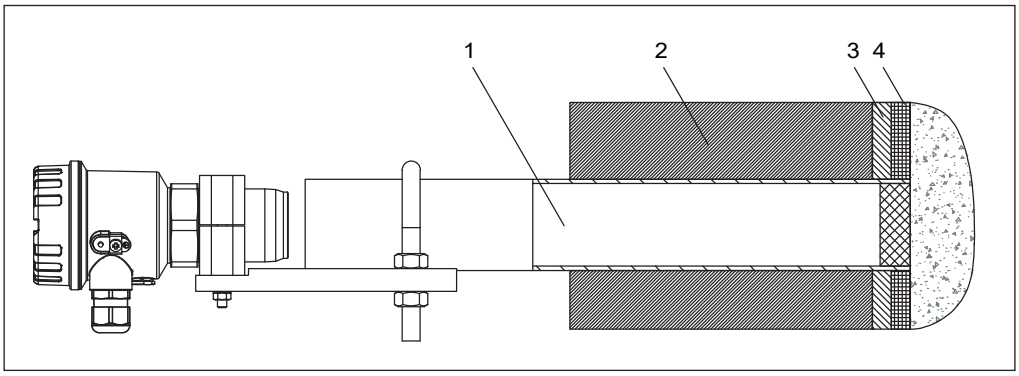


Figure 20: Mounting with spacer tube

1 Spacer tube
2 Process insulation
3 Container wall
4 Inner lining

Notice!
- Suitable spacer tubes of type FAR53, made of steel or stainless steel, are available as accessories in different versions (→ page 41).
- When there is a risk of condensate forming in the spacer tube, we recommend using process nozzle type FAR50 (→ page 40), which is equipped with a mounting flange with a pressure equalization element.

For structural or space reasons, it may be necessary to mount the FTR20 devices at an angle to the planned mounting location. In this case, a spacer tube can be used as a wave guide, meaning that no additional signal attenuation occurs due to the wave guide effect.

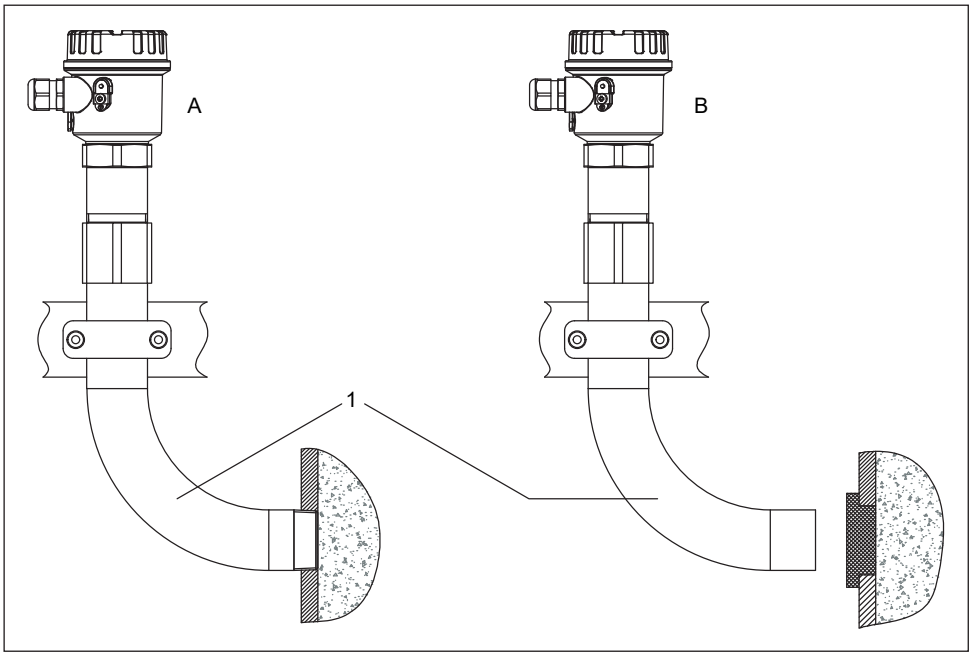


Figure 21: Mounting with wave guide

A Mounting directly in the process with connection thread
B Mounting in front of the process plug without connection thread
1 Wave guide

Notice!
- The pipe can be made of any desired metallic material.
- Edges inside the pipe (for example at transitions) can cause signal attenuation and thus should be avoided wherever possible.
- Suitable stainless steel wave guides of type FAR55 are available as accessories in different versions (→ page 41).

Mounting with high temperature adapter and length extensions

For simple and easily accessible high temperature applications in the range from +70 to +450°C (+158 to +842°F) there is a simple adapter with flush-mounted aluminum oxide ceramic, which can be extended with length extensions.

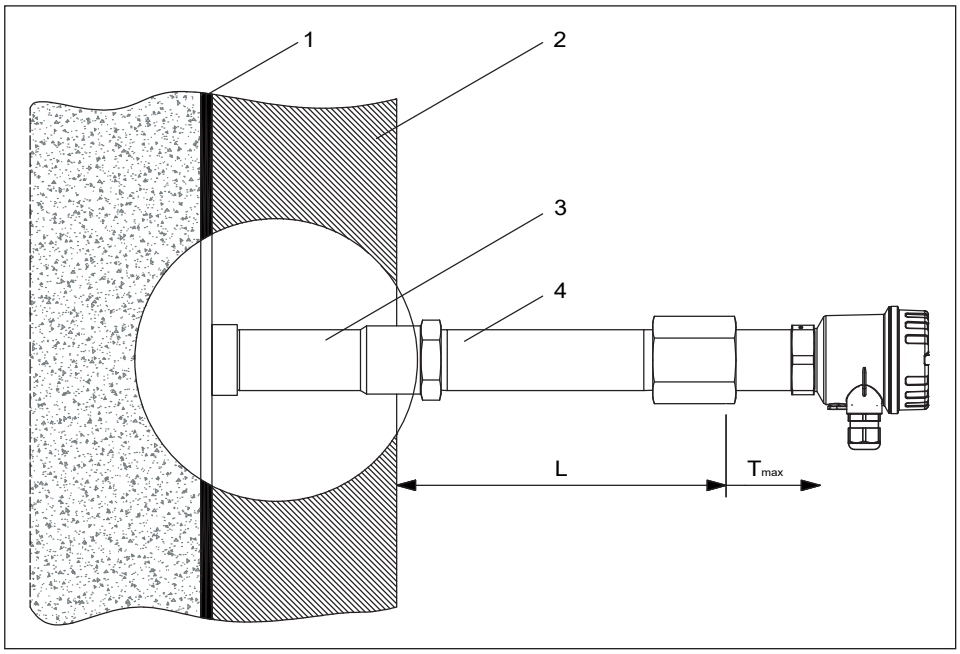


Figure 22: Mounting with high temperature adapter and length extensions

1 Wall
2 Insulation
3 High temperature adapter
4 Extension

Notice!
- The maximum process pressure of 80 to 510 kPa (0.8 to 5.1 bar) abs. at the high temperature adapter must be observed.
- The maximum temperature **Tmax** of +70°C (+158°F) at the process connection of FTR20 devices must be observed (**L** is to be selected according to the process and ambient temperatures), exceeding this temperature will cause destruction.
- Suitable high temperature adapters and length extensions made of stainless steel are available as accessories (→ page 42).

Environment

Ambient temperature range	-40 to +70°C (-40 to +158°F)
Storage temperature	-40 to +80°C (-40 to +176°F)
Degree of protection	• IP 66 (with closed housing) • IP 20 (with open housing)
Vibration resistance	see vibration influence (→ page 11)
Electromagnetic compatibility (EMC)	• Interference emission to EN 61326, Electrical Equipment Class B • Interference immunity to EN 61326, Appendix A (Industrial) • Normal installation cable is sufficient for the wiring.

Process

Process temperature range	• Without optional process adapter: -40 to +70°C (-40 to +158°F) • With optional high temperature adapter (→ page 42): -40 to +450°C (-40 to +842°F) • Note deviating temperature ranges with the accessories offered!
Process pressure range	• 50 to 680 kPa (0.5 to 6.8 bar) absolute, only to be observed with FTR20 installed directly in the process • 80 to 510 kPa (0.8 to 5.1 bar) absolute, with use of the optional high temperature adapter • 50 to 2000 kPa (0.5 to 20 bar) absolute, with use of the optional high pressure adapter • Note deviating pressure ranges with the accessories offered.
Vibration	see vibration influence (→ page 11)

Mechanical construction

Dimensions

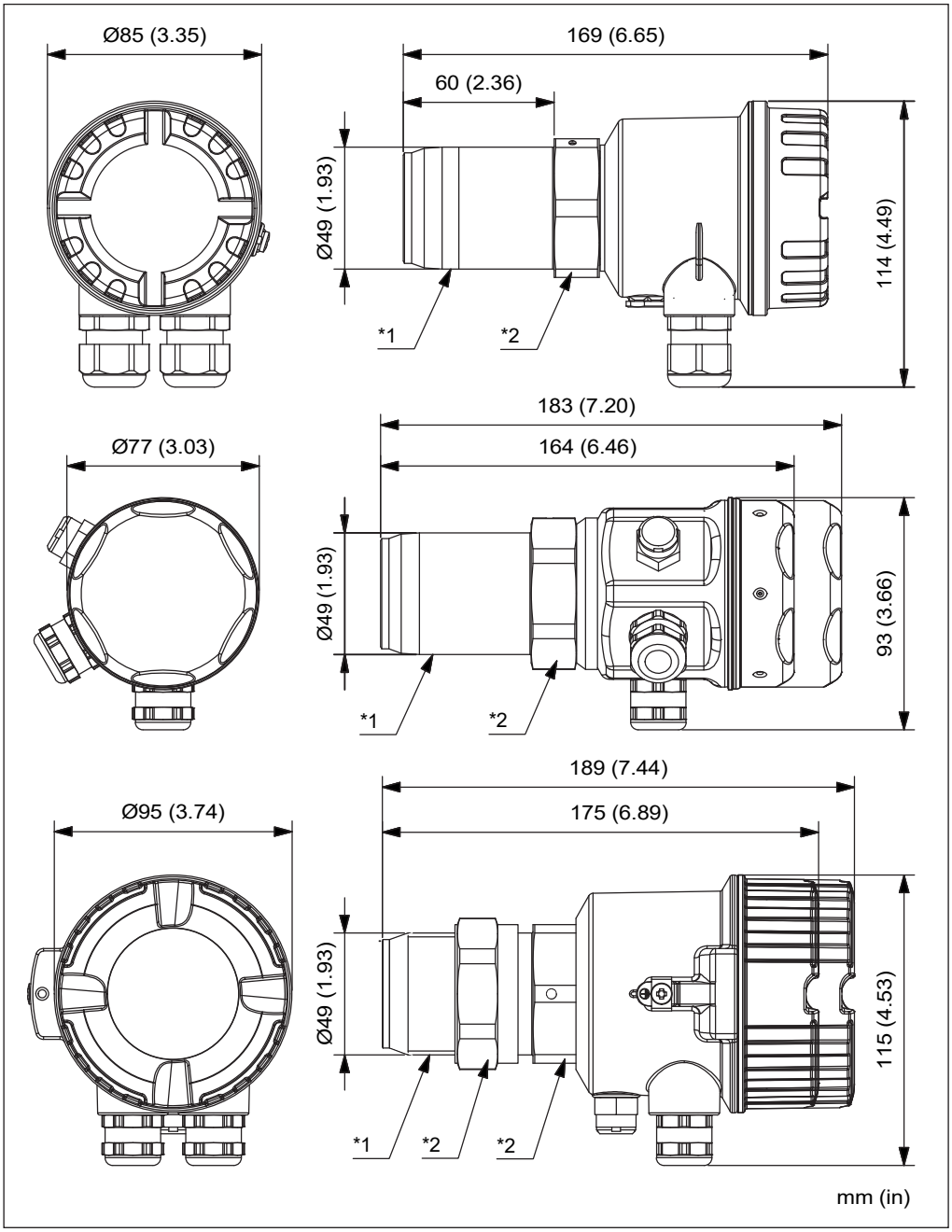


Figure 23: Dimensions

1 Connection thread R 1½, 1½ NPT or G 1½
2 Hexagon SW55

Weight

0.7 to 1.7 kg (1.54 to 3.75 lbs), depending on the selected housing and process connection

Notice!
On device variants with connector and extended ordering option “Electronics, encapsulated” (→ page 30) the weight increases by 0.2 kg (0.44 lbs).

Materials

- Stainless steel 316Ti (1.4571):
  - Process connection
  - Pressure equalization element (housing made of stainless steel and aluminum)
- Stainless steel 316L (1.4435):
  - Housing
  - Adapter ½ NPT (F15/F34 housing)
- Aluminum:
  - Housing
- Plastic:
  - Housing
  - M20 cable gland, adapter ½ NPT and pressure equalization element (housing made of plastic)
- Die-cast zinc:
  - M12 connector, nickel-plated
  - Harting connector, powder-coated
- Brass, nickel-plated:
  - M20 cable gland (housing made of stainless steel and aluminum)

Process connections

Connection thread:
- R 1½ in accordance with EN 10226
- 1½ NPT in accordance with ANSI/ASME
- G 1½ in accordance with ISO 228-1

Operability

By using frequencies in the 24 GHz range, the material flow of products with low attenuation can be detected, even if the product quantities are low. The calibration options for the FTR20 flow indicator offer the necessary flexibility to ensure that the device can be easily adapted to the application:

- Adjustable sensitivity
- Switchable limit signal function:
  - Switch point exceeded = max. safety or
  - Switch point not reached = min. safety
- Adjustable switching hysteresis (not for current output)
- Switching delay (not at current output):
  - 100 ms to 20 s
  - Response and drop-out delay, can be selected separately
- LED field strength indicator as an adjustment and positioning aid

Operating concept

The FTR20 is configured using the function selection and the two operating keys. By doing so, calibration to a sensitivity necessary for clear and unambiguous material flow identification of the products is carried out. If the movement of the bulk solids is sufficient, the FTR20 responds with an output signal to this effect.

The parameter configuration is stored internally and is retained even after the supply voltage is disconnected. No other operator intervention is necessary during operation. The adaptation to the application is required during initial installation only. However, subsequent changes can be made and stored at any time.

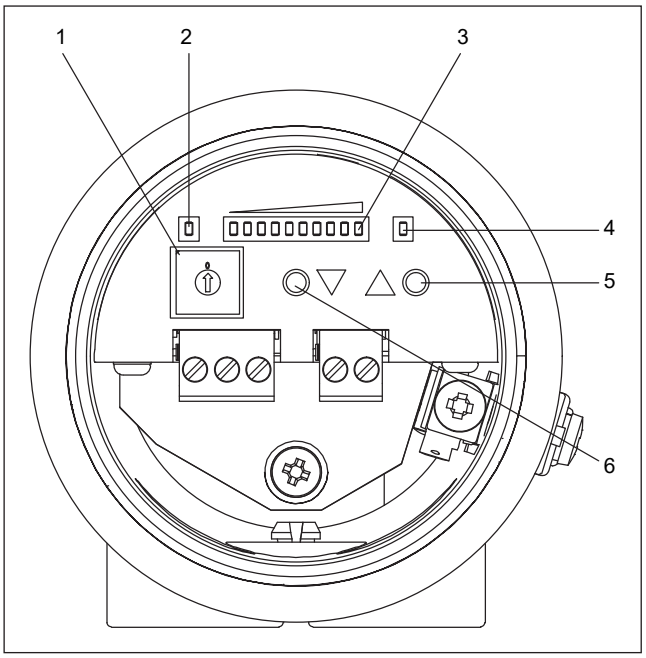


Figure 24: Display and control elements

1 Rotary coding switch function selection
2 LED operate (green)
3 Bar graph
4 LED switch output (yellow)
5 Operation key (+)
6 Operation key (-)

Display

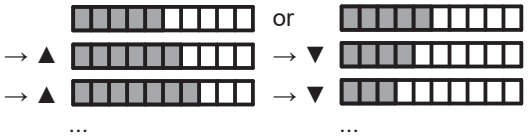
The signal strength as well as the configured values (in the function selection) are displayed locally using a bar graph display. In addition, a green LED indicates that the device is ready to operate (supply voltage is present) and a yellow LED displays the status of the switch output (LED off: relay in rest position, solid-state relay high-impedance).

Notice!
- Toggling the encoding switch position unequal “0” (function selection) puts the FTR20 into parameter configuration mode. The bulk solids motion detector continues to work in the background, changed settings are taken into account directly.
- Remember to set the encoding switch to position “0” (= operation) when you have finished configuring settings.
- For current output, the yellow LED (4) has no function and remains off.

Local operation

Parameter configuration is performed as follows:

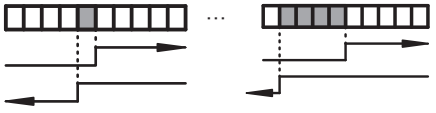
1. Select any function (see “Programming functions”)
   → Encoding switch (1) = 1 to F
   → The display shows the selected function for two seconds.
   Example function 3: 
2. Setting the selected function
   Example: Function 3 (manual calibration with movement of bulk solids)
   → Using the (6)▼ and (5)▲ keys, the sensitivity can be increased or reduced in 10% increments.

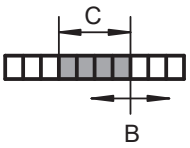


3. The configured value is stored as soon as the function is switched. The value can be displayed again at any time by selecting the corresponding programming function and changed if necessary.
4. Once parameter configuration is complete (i.e. once the motion detector has been adapted to the bulk solids in question), the encoding switch must be returned to the “0” position. The FTR20 is now ready for operation.

Notice!
When a calibration is carried out, it can be read out and, for example in the case of a device change, transferred directly to the new FTR20 (→ page 32). If the new device is installed in the same position, this means that the device is correctly calibrated.

Parameterisation functions

Function / meaning	Value range
1 =  Automatic calibration with movement of bulk solids	—
2 =  Automatic calibration with no movement of bulk solids	—
3 =  Manual calibration with movement of bulk solids	Upper limit from function 1:  minimum ...  maximum
4 =  Manual calibration with no movement of bulk solids	Lower limit from function 1:  minimum ...  maximum
5 =  Hysteresis setting	

Function / meaning	Value range
6 =  Selection of the limit signal function (Min./Max. safety, relay output only)	 Relay switches with movement of bulk solids  Relay switches with slow or no movement of bulk solids
7 =  Switching delay setting (response delay)	 off (no delay)  100 ms … (200/300/500 ms, 1/2/3/5/10 s)  20 s
8 =  Switching delay setting (drop-out delay)	
9 =  Enable simulation mode	 Low level of bulk solids movement …  High level of bulk solids movement
A =  Attenuation setting	 off (no attenuation)  100 ms … (200/300/500 ms, 1/2/3/5/10 s)  20 s
B =  Configuring the amplification	 Display and, if necessary, adjustment of settings made in function 1 to 4
C =  Setting of detection range (window width)	
D = 	without function
E = 	
F =  Reset to factory settings	—

Notice!
Further information on settings and parameter configuration can be found in the Operating Instructions (→ page 31).

Certificates and approvals

CE mark

The FTR20 flow indicator meets the legal requirements of the applicable EU guidelines. These are listed in the corresponding EU Declaration of Conformity, together with the applied standards.
By applying the CE mark, Kirchgaesser confirms that the device has passed the necessary tests.

Ex approval

The measuring device is certified for use in hazardous areas and the safety instructions are to be observed (→ page 5).

Notice!
Certificates → page 31

Telecommunications

- EN 300440
  Short range radio devices (SRD) – radio devices for operation in a frequency range of 1 GHz to 40 GHz
- FCC Rule Parts 15C
- IC according to RSS-210 Issue 8, RSS-GEN Issue 3 and RSS-102 Issue 4

Other standards and guidelines

- EN 60529
  Degrees of protection provided by enclosures (IP code)
- EN 61010-1
  Protection measures for electrical equipment for measurement, control, regulation and laboratory use
- EN 61326-X
  EMC product family standard for electrical equipment for measurement, control and laboratory use

Ordering information

Order code

10	**Approval:**						
	AA	Non-hazardous area					
	BA	ATEX II 1/2D Ex ta/tb IIIC T102°C Da/Db IP66 / ATEX II 2D Ex tb IIIC T102°C Db IP66					
	CA	CSA C/US General Purpose					
	CB	CSA C/US Class II, Div. 1, Group E-G					
	GA	EAC Ex ta/tb IIIC T102°C Da/Db / EAC Ex tb IIIC T102°C Db					
	GR	Non-hazardous area + EAC					
	IA	IECEx Ex ta/tb IIIC T102°C Da/Db IP66 / IECEx Ex tb IIIC T102°C Db IP66					
	99	Special version, to be specified					
20		**Output:**					
		1	Relay SPDT				
		2	Current 4 - 20 mA				
		3	Solid-state relay				
		9	Special version, to be specified				
30			**Power supply:**				
			A	85 - 253 VAC, 50/60 Hz			
			E	20 - 60 VDC			
				20 - 30 VAC, 50/60 Hz			
			Y	Special version, to be specified			
40				**Housing:**			
				A	Polyester, IP66		
				B	Stainless steel, IP66		
				C	Stainless steel, IP66 + sight glass		
				D	Aluminum, IP66		
				E	Aluminum, IP66 + sight glass		
				Y	Special version, to be specified		
50					**Electrical connection:**		
					A	Cable gland M20	
					D	Thread ½ NPT	
					E	2x plug M12 Binder series 713/763	
					F	2x plug M12 Binder series 713/763	
						+ suitable mating connectors	
					H	2x Harting connector HAN8D	
					J	2x Harting connector HAN8D	
						+ suitable mating connectors	
					Y	Special version, to be specified	
60						**Process connection:**	
						GG2	Thread ISO 228 G 1½, 316Ti
						XFA	Thread EN 10226 R 1½, Alu
						VEA	Thread ANSI 1½ NPT, Alu
						XF2	Thread EN 10226 R 1½, 316Ti
						VE2	Thread ANSI 1½ NPT, 316Ti
						YYY	Special version, to be specified

70							**Window transmission:**	
							1	PTFE
							2	Ceramic
							9	Special version, to be specified

FTR20 -								

Extended order code

The following order code is optional:

80								**Services: *1**				
								IM	User-specific settings			

90								**Test, report, declaration: *1**				
								JA	Inspection certificate EN10204-3.1, wetted metallic parts			
								KH	Final inspection report			

100									**Accessory mounted: *1**			
									NA	Electronics encapsulated		

110										**Accessory enclosed: *1**		
										R9	Special version, to be specified	

120											**Tag: *1**	
											Z1	Stainless steel
											Z2	Paper
											Z3	Additionally provided

FTR20 -												

*1 Multiple selection possible

Comments regarding the product structure

For devices with certification options **BA**, **GA** and **IA**, the following restrictions apply:
- **Housing (40)**: only (**B**) to (**E**)
- **Electrical connection (50)**: only (**A**) and (**D**)
- **Window transmission (70)**: only (**1**)

For devices with certification option **CA**, the following restrictions apply:
- **Housing (40)**: only (**A**) to (**C**)
- **Electrical connection (50)**: only (**A**) and (**D**)

For devices with certification option **CB**, the following restrictions apply:
- **Housing (40)**: only (**B**) and (**C**)
- **Electrical connection (50)**: only (**A**) and (**D**)
- **Window transmission (70)**: only (**1**)

For the optional ordering options, the following restrictions apply:
- **Accessory mounted (100), electronics encapsulated (NA)**: only with electrical connection (**E**) to (**J**)

Documentation

The following documents can be downloaded from *www.kirchgaesser.com*:
- Operating Instructions FTR20, German (ba059000en)
- EU-Type Examination Certificate BVS 11 ATEX E 032 (bp059000a1)
- EAC Certificate of Conformity TC RU C-DE.AA87.B.01096 (tr059001ru)
- IECEx Certificate of Conformity IECEx BVS 11.0016 (ec059000en)
- CSA Certificate of Compliance 2609701 (cs059000en)

Scope of delivery

The scope of delivery includes the FTR20 in a box with operating instructions included.

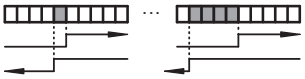
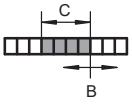
User-specific settings

Ordering a device with the extended option “**User-specific settings**”, it will be programmed according to the customers specification during assembly, in this case the following form must be completed and added.

User-specific settings FTR20

Kirchgaesser Industrieelektronik GmbH

Order code: **FTR20 -**	
Device no.:	

Function / Meaning	Value range	Setting
1 = Automatic adjustment with bulk solids in motion		—
2 = Automatic adjustment with bulk solids standing still		—
3 = Manual adjustment with bulk solids in motion		—
4 = Manual adjustment with bulk solids standing still		—
5 = Hysteresis setting		
6 = Selection of the limit signal function (min./max. safety, relay output only)	Relay switches with: movement of bulk solids no movement of bulk solids	
7 = Switching delay setting (switch-on delay) 8 = Switching delay setting (switch-off delay)	off (no delay) 100 ms 200 ms ... (300 ms, 500 ms, 1 s, 2 s, 3 s, 5 s, 10 s) 20 s	
9 = Enable simulation mode		—
A = Damping setting	See function 7/8	
B = Amplification setting		
C = Detection range setting		

Example (Adjustment by specifiying of B+C not necessary):

- Hysteresis (5) □□□□X□□□□□ = minimum
- Limit signal function (6) XXXXX□□□□□ = Relay switches with movement of bulk solids
- Switch-on delay (7) □□□□□□□□□□ = off
- Switch-off delay (8) XXX□□□□□□□ = 300 ms
- Damping (A) X□□□□□□□□□ = 100 ms
- Amplification (B) □□□XXXX□□□
- Detection range (C) XXXX□□□□□□

Notice!
The blank form can be used for documentation of the FTR20 device settings.

Accessories

Various accessories are available for the device, and can be ordered with the device or at a later stage from Kirchgaesser.

Mating connectors

For the device variants with connectors the following mating connectors an be used:
- Order no.:
  307409, M12 Binder series 713/763, 4-pole
  307412, Harting HAN8D

Notice!
On device variants with electrical connection **F** and **J** the mating connectors are part of the delivery.

Prefabricated connection cables

For the device variants with connectors the following prefabricated connection cables can be used:
- Order no.:
  307407, M12 Binder series 713/763, 4 x 0.34 mm², PUR, length 2 m (6.45 ft)
  307408, M12 Binder series 713/763, 4 x 0.34 mm², PUR, length 5 m (16.40 ft)
  307410, Harting HAN8D, 4 x 0.75 mm², PUR, length 2 m (6.45 ft)
  307411, Harting HAN8D, 4 x 0.75 mm², PVC, length 5 m (16.40 ft)
- Weight: approx. 0.19 kg (M12 series 713/763, 2 m) / 0.45 kg (Harting HAN8D, 5 m)

Mounting bracket

For mounting on frames, cross beams or similar which are already available, the following mounting brackets can be used:
- Order no.:
  307287, aluminum
  307288, plastic
- Weight: approx. 0.06 kg (plastic) / 0.22 kg (aluminum)
- The delivery does not include any mounting screws, as the type and length are dependent on on-site conditions.

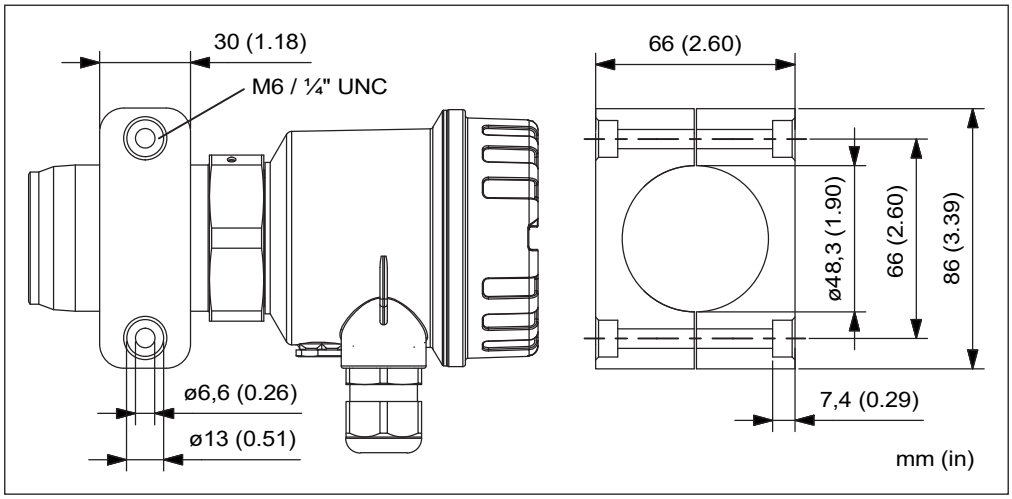


Figure 25: Mounting bracket dimensions

Mounting flange

The following mounting flanges can be used for mounting on available process nozzles with connection dimensions in accordance with DIN EN 1092-1:

• Order no.:
104830, DN40 PN16, Rp 1½ internal thread
307378, DN40 PN16, Rp 1½ internal thread, inspection certificate acc. to EN 10204-3.1
307413, DN40 PN16, G 1½ internal thread
307414, DN40 PN16, G 1½ internal thread, inspection certificate acc. to EN 10204-3.1
307371, DN50 PN16, Rp 1½ internal thread
307380, DN50 PN16, Rp 1½ internal thread, inspection certificate acc. to EN 10204-3.1
307415, DN50 PN16, G 1½ internal thread
307416, DN50 PN16, G 1½ internal thread, inspection certificate acc. to EN 10204-3.1
106114, DN100 PN16, Rp 1½ internal thread
307382, DN100 PN16, Rp 1½ internal thread, inspection certificate acc. to EN 10204-3.1
307417, DN100 PN16, G 1½ internal thread
307418, DN100 PN16, G 1½ internal thread, inspection certificate acc. to EN 10204-3.1
• Material: Stainless steel 316Ti (1.4571)
• Weight: DN40 approx. 2.3 kg (5.07 lbs) to DN100 approx. 5.8 kg (12.79 lbs)

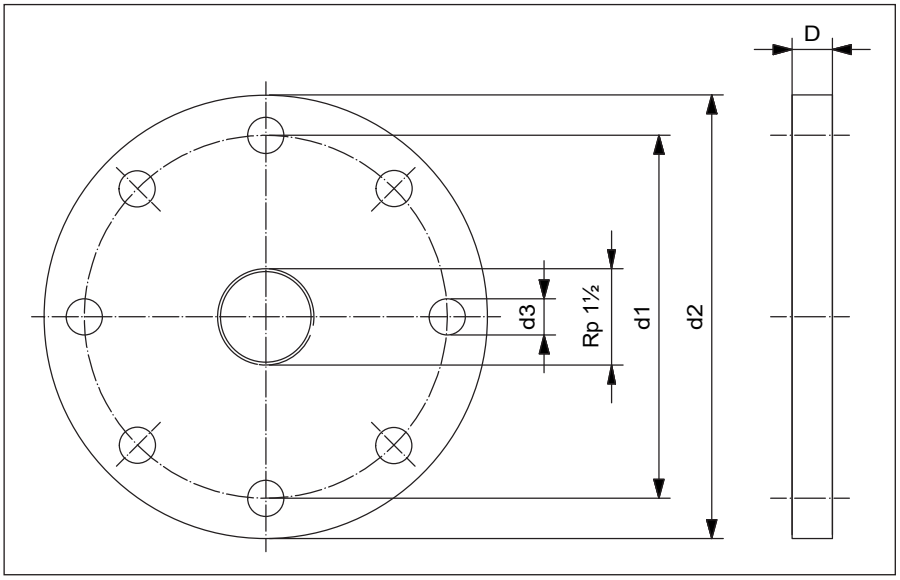


Figure 26: Dimensions of mounting flange (connection dimensions in accordance with EN 1092-1)

Flange	d1 mm (in)	d2 mm (in)	d3 mm (in)	D mm (in)	Holes
DN40/PN16	110 (4.33)	150 (5.91)	18 (0.71)	18 (0.71)	4
DN50/PN16	125 (4.92)	165 (6.50)	18 (0.71)	18 (0.71)	4
DN100/PN16	180 (7.09)	220 (8.66)	18 (0.71)	20 (0.79)	8

The following mounting flanges can be used for mounting on available process nozzles with connection dimensions in accordance with ANSI/ASME B16.5:

• Order no.:
307370, 1½" 150 lbs, 1½ NPT internal thread
307379, 1½" 150 lbs, 1½ NPT internal thread, inspection certificate acc. to EN 10204-3.1
307372, 2" 150 lbs, 1½ NPT internal thread
307381, 2" 150 lbs, 1½ NPT internal thread, inspection certificate acc. to EN 10204-3.1
307374, 4" 150 lbs, 1½ NPT internal thread
307383, 4" 150 lbs, 1½ NPT internal thread, inspection certificate acc. to EN 10204-3.1
• Material: Stainless steel 316Ti (1.4571)
• Weight: 1½" approx. 1.5 kg (3.31 lbs) to 4" approx. 6.8 kg (15.0 lbs)

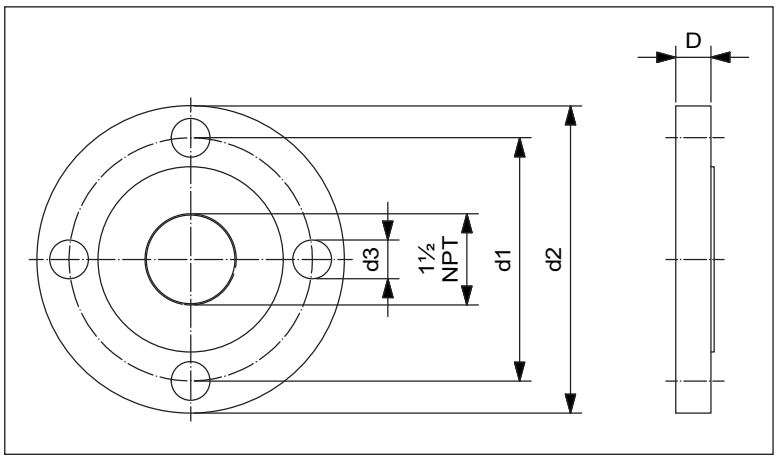


Figure 27: Dimensions of mounting flange (connection dimension in accordance with ANSI/ASME B16.5)

Flange	d1 mm (in)	d2 mm (in)	d3 mm (in)	D mm (in)	Holes
1½" 150 lbs	98.6 (3.88)	127 (5.00)	15.7 (0.62)	17.5 (0.69)	4
2" 150 lbs	120.7 (4.75)	152.4 (6.00)	19.1 (0.75)	19.1 (0.75)	4
4" 150 lbs	190.5 (7.50)	228.6 (9.00)	19.1 (0.75)	23.9 (0.94)	8

Weld-in or screw-in adapter

For mounting in process walls with existing threads or bores, adapters of type FAR52 can be used (→ Catalogue extract ka070002en):

- Weld-in adapter with internal thread Rp 1½, 1½ NPT and G 1½
- Screw-in adapter for thread R 2 to R 4 and 2 NPT to 4 NPT, with internal thread R 1½ or 1½ NPT
- Material: Stainless steel 316Ti (1.4571) and steel P235GH (1.0345)
- Weight: FAR52-AAAA1A approx. 0.3 kg (0.66 lbs) to FAR52-BVL22B approx. 1.8 kg (4 lbs)

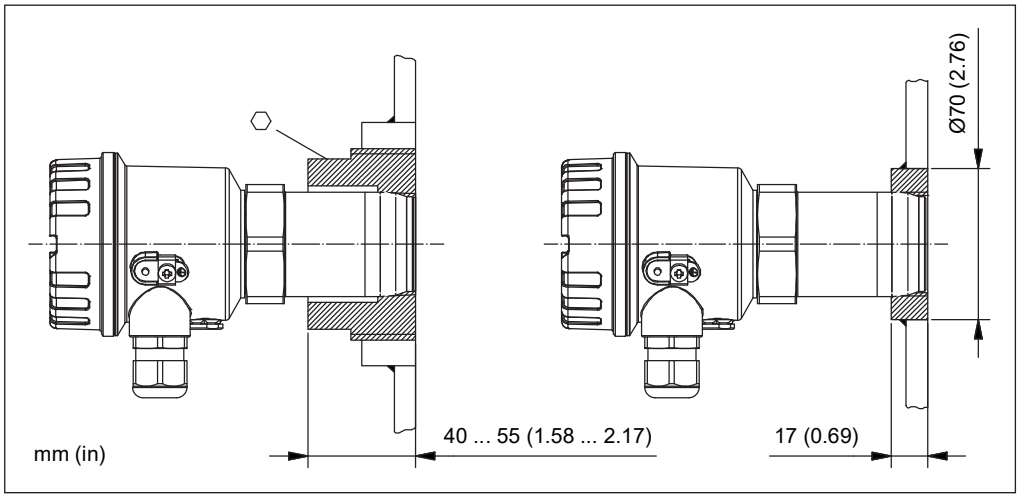


Figure 28: Dimensions of weld-in or screw-in adapter FAR52

High pressure adapter

For mounting of with a microwave-impermeable process wall and high process pressure up to 2000 kPa (20 bar) absolute, the following high pressure adapters (→ page 14) can be used:

- Order no.:
  - 307419: Process and device connecting thread G 1½ acc. to ISO 228-1
  - 307420: Process and device connecting thread G 1½ acc. to ISO 228-1, inspection certificate acc. to EN 10204-3.1
  - 307421: Process connecting thread G 1½ acc. to ISO 228-1, device connetion thread 1½ NPT acc. to ANSI/ASME
  - 307422: Process connecting thread G 1½ acc. to ISO 228-1, device connection thread 1½ NPT acc. to ANSI/ASME, inspection certificate acc. to EN 10204-3.1
- Material: Stainless steel 316Ti, PTFE window transmission
- Weight: approx. 0.8 kg (1.76 lbs)

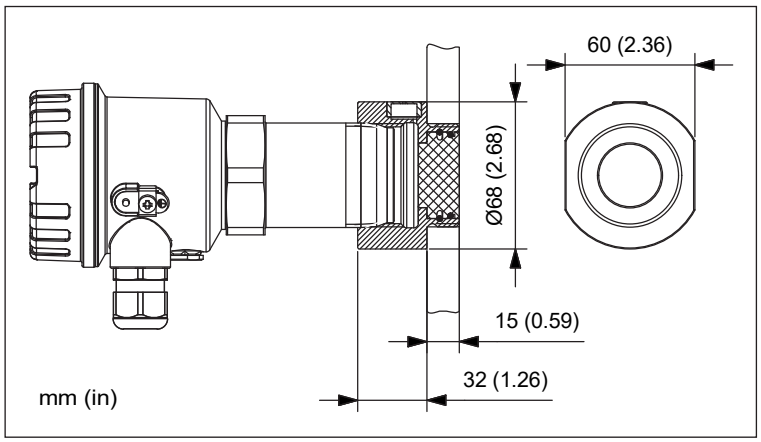


Figure 29: Dimension of the high pressure adapter

Plug

For mounting with microwave-impermeable process walls, plugs of type FAR54 can be used (→ Catalogue extract ka070004en):

- Material: PTFE and aluminium oxide ceramic
- Process temperature: max. -40 to +800°C (-40 to +1472°F)
- Weight: FAR54-ABCBFAAAA2 approx. 0.06 kg (0.13 lbs) to FAR54-CCBCABEBJ3 approx. 3.2 kg (7.05 lbs)

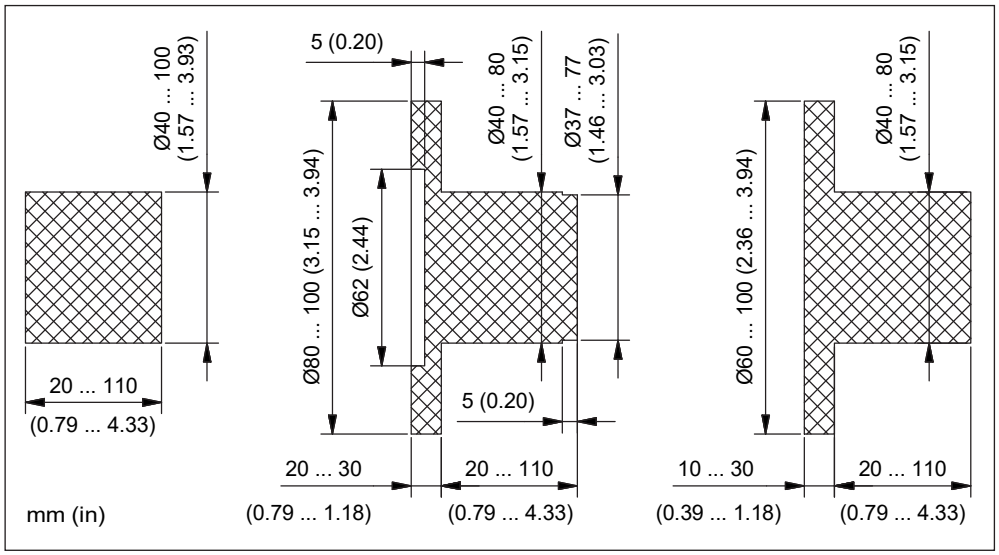


Figure 30: Dimensions of FAR54 plugs

Sight glass fitting

For mounting with microwave-impermeable process walls and unpressurized process, the following sight glass fittings can be used for welding on or in:

- Order no.:
  307281, DN50
  307283, DN80
  307279, DN100
- Material: Stainless steel 316Ti, silicon seal (max. +200°C/+392°F)
- Weight: DN50 approx. 2.4 kg (5.29 lbs) to DN100 approx. 4.1 kg (9.04 lbs)
- The delivery includes the inspection glass fitting, incl. seals and mounting screws.

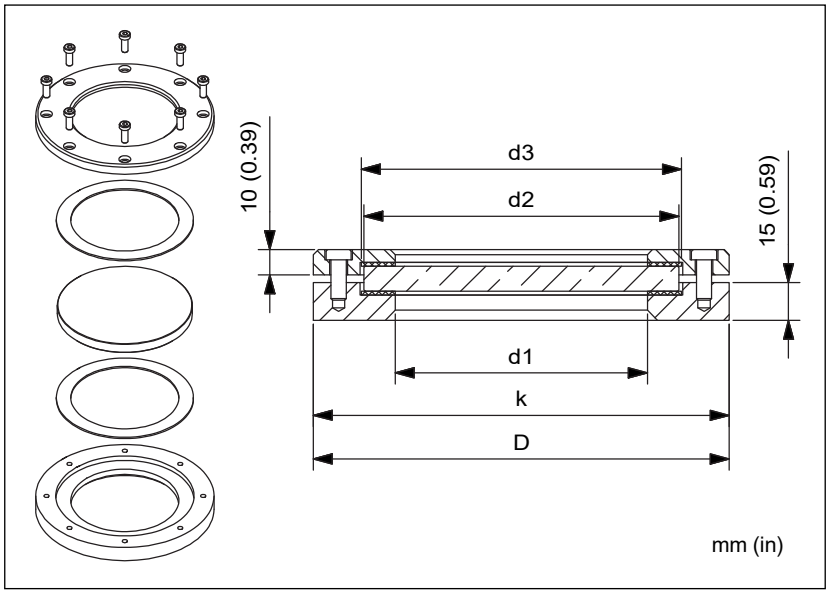


Figure 31: Dimensions of sight glass fitting for welding on/in for unpressurized processes

DN	d1 mm (in)	d2 mm (in)	d3 mm (in)	D mm (in)	k mm (in)
50	80 (3.15)	100 (3.94)	102 (4.02)	140 (5.51)	120 (4.72)
80	100 (3.94)	125 (4.92)	127 (5.00)	165 (6.50)	145 (5.71)
100	125 (4.92)	150 (5.91)	152 (5.98)	190 (7.48)	170 (6.69)

For mounting with microwave-impermeable process walls and process up to max. 1 MPa (10 bar), the following sight glass fittings can be used for welding on or in:

- Order no.:
  307280, DN50
  307282, DN80
  300726, DN100
- Material: Stainless steel 316Ti, silicone seal (max. +200°C/+392°F)
- Weight: DN50 approx. 6.7 kg (14.77 lbs) to DN100 approx. 13 kg (28.66 lbs)
- The delivery includes the inspection glass fitting, iseals and mounting screws.

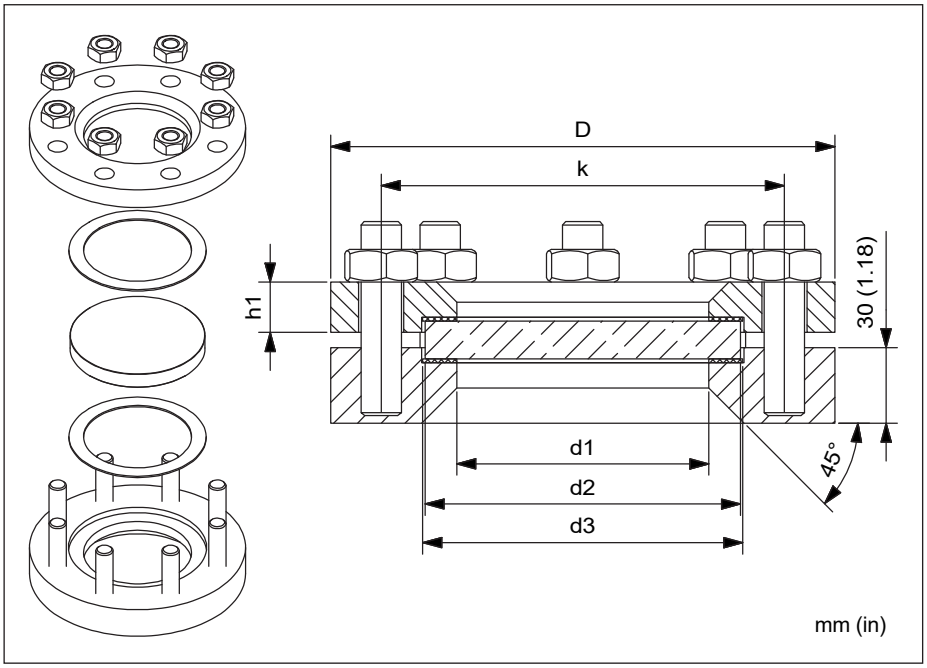


Figure 32: Dimensions of sight glass fitting for welding on/in for processes up to 1 MPa

DN	d1 mm (in)	d2 mm (in)	d3 mm (in)	D mm (in)	k mm (in)	h1 mm (in)
50	80 (3.15)	100 (3.94)	102 (4.02)	165 (6.50)	125 (4.92)	16 (0.63)
80	100 (3.94)	125 (4.92)	127 (5.00)	200 (7.87)	160 (6.30)	20 (0.79)
100	125 (4.92)	150 (5.91)	152 (5.98)	220 (8.66)	180 (7.09)	22 (0.87)

For mounting on available block flanges or counter flanges (process pressure up to max. 2.5 MPa (25 bar), the following bolt-on sight glass fittings can be used:

- Order no.:
  307285, DN50
  307286, DN80
  307284, DN100
- Material: Stainless steel 316Ti, PTFE and C4400 seals (max. +200°C/+392°F)
- Weight: DN50 approx. 5.4 kg (11.90 lbs) to DN100 approx. 15.9 kg (35.05 lbs)
- The delivery includes the sight glass fitting incl. seals but does not include mounting screws (type and length are dependent on the structural situation).

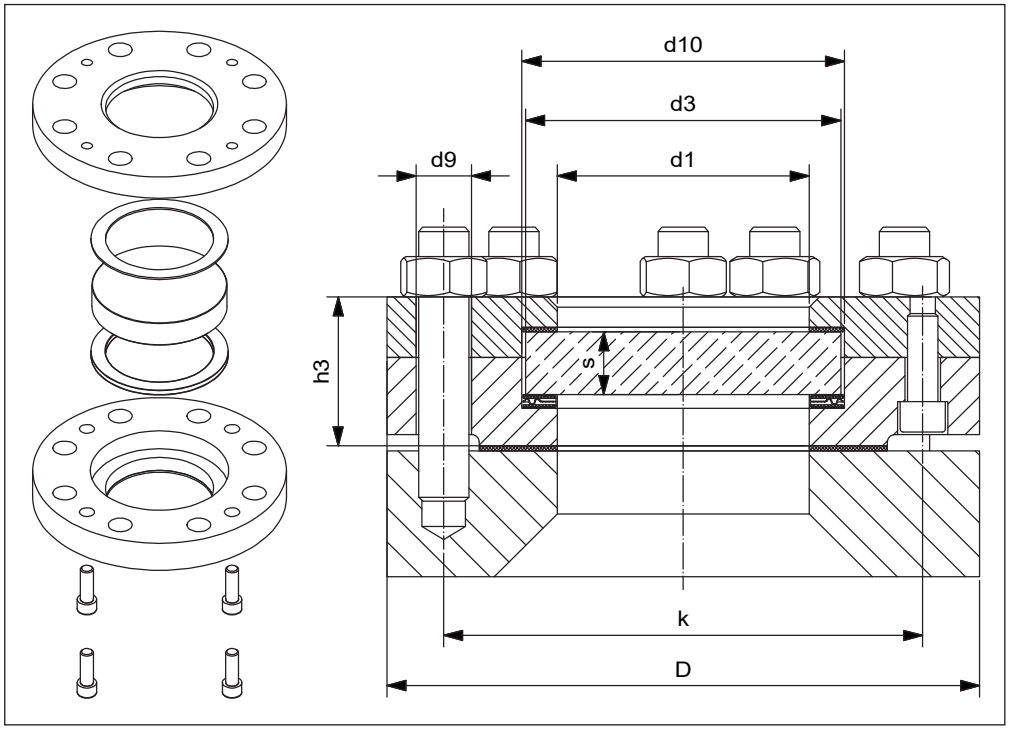


Figure 33: Dimensions of sight glass fitting for bolting on for processes up to 2.5 MPa

DN	d1 mm (in)	d2 mm (in)	s mm (in)	D mm (in)	k mm (in)	h3 mm (in)	d9 mm (in)	d10 mm (in)
50	65 (2.56)	80 (3.15)	15 (0.59)	165 (6.50)	125 (4.92)	41 (1.61)	18 (0.71)	82 (3.23)
80	80 (3.15)	100 (3.94)	20 (0.79)	200 (7.87)	160 (6.30)	50 (1.97)	18 (0.71)	102 (4.02)
100	100 (3.94)	125 (4.92)	25 (0.98)	235 (9.25)	190 (7.48)	59 (2.32)	22 (0.87)	127 (5.00)

Insertion adapter

For mounting on existing process nozzles, insertion adapters of type FAR51 can be used (→ Catalogue extract ka070001en):

- Process nozzle DN50 to DN100 PN16 shape A, 2 NPT to 4 NPT 150 lbs RF
- Nozzle lengths: 100 to 300 mm
- Connection thread R 1½, 1½ NPT and G 1½
- Optional with PTFE or aluminum oxide ceramic disc
- Process temperature: max. -40 to +450°C (-40 to +842°F)
- Process pressure: max. 80 to 510 kPa (0.8 to 5.1 bar) absolute
- Material: 316Ti stainless steel (1.4571)
- Weight: approx. 5 to 10 kg (11 to 22 lbs)

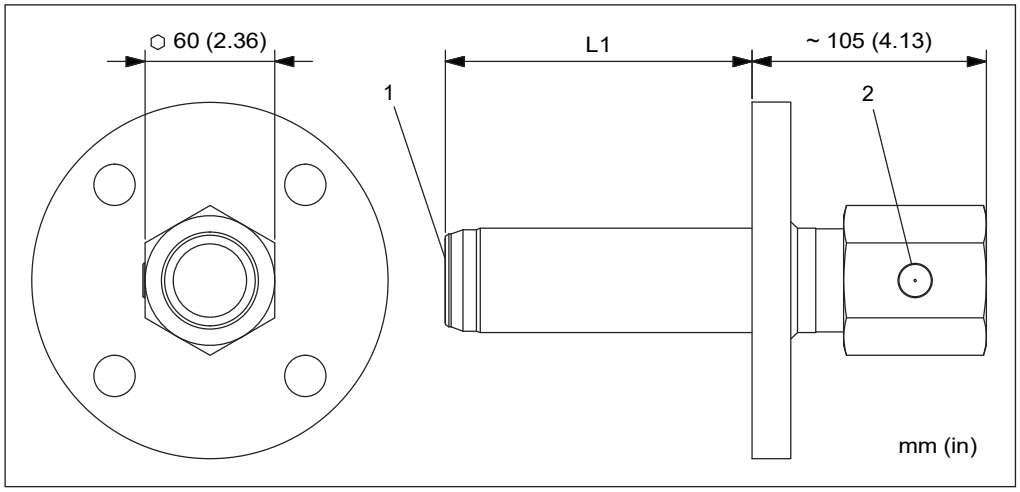


Figure 34: Dimensions of plug-in adapters

1 Sealed disc, optional
2 Venting element

Weld-in nozzles

For nozzle mounting, weld-in nozzles of type FAR50 can be used (→ Catalogue extract ka070000en):

- Process nozzle DN50 to DN100 PN16 shape A, 2 NPT to 4 NPT 150 lbs RF
- Nozzle lengths: 150 to 300 mm
- Connection thread R 1½, 1½ NPT and G 1½
- With optional PTFE disc
- Process temperature: max. -40 to +200°C (-40 to +392°F)
- Material: 316Ti stainless steel (1.4571)
- Weight: approx. 6 to 28 kg (13 to 62 lbs)

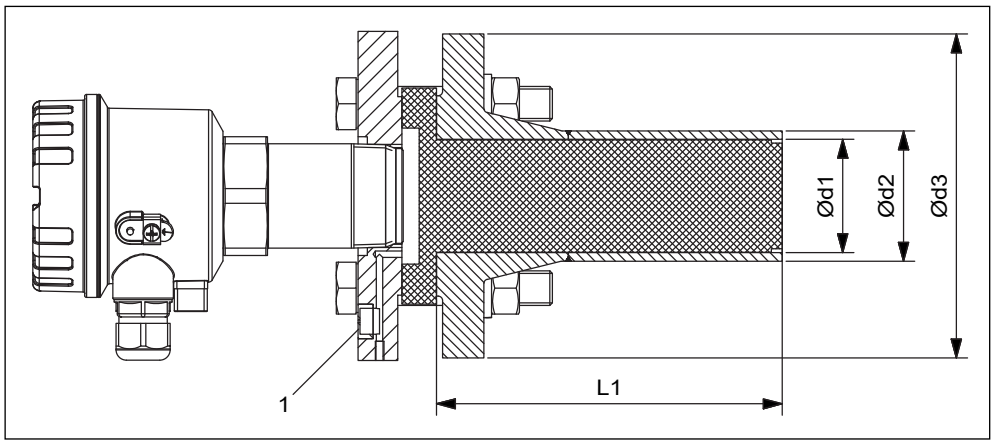


Figure 35: Dimensions of weld-in nozzles

1 Venting element

Spacer tube

For mounting in open processes or processes with an internal lining, such as clay, spacer tubes of type FAR53 can be used (→ Catalogue extract ka070003en):
- Process connection: With or without thread R 2, 2 NPT and G 2
- Pipe lengths: 200 to 2000 mm
- With optional aluminum oxide ceramic disc
- Process temperature: max. -40 to +450°C (-40 to +842°F)
- Material: 316Ti stainless steel (1.4571) or P235GH steel (1.0345)
- Weight: 200 mm approx. 5.3 kg (11.7 lbs) to 2000 mm approx. 22.2 kg (48.9 lbs)

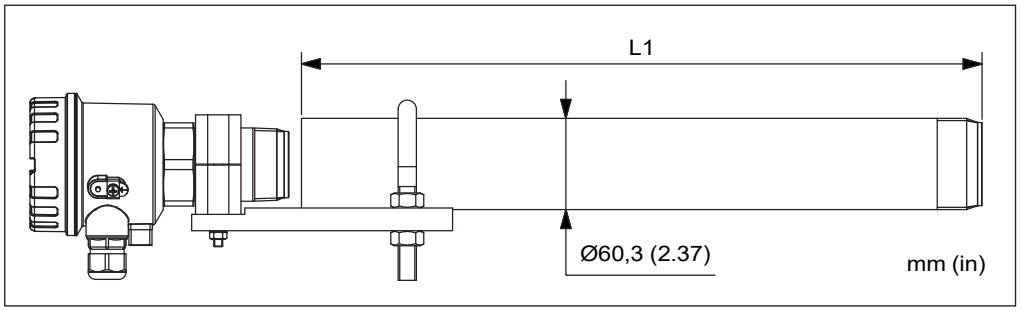


Figure 36: Dimensions of spacer tube (wave guide)

Wave guide

For mounting in structurally restricted installation positions, wave guides of type FAR55 can be used (→ Catalogue extract ka070005en).
- Process connection: With or without thread R 1½ and 1½ NPT
- Lengths: L1 = 200 to 1500 mm, L2 = 200 to 2000 mm
- Process temperature: max. -40 to +450°C (-40 to +842°F)
- Device connection: Receptacle, suitable for thread R 1½, 1½ NPT and G 1½
- Material: 316Ti stainless steel (1.4571)
- Weight: FAR55-AAAACGAA2* approx. 2.0 kg (4.41 lbs) to FAR55-BAAADGDL2* approx. 17.8 kg (39.24 lbs)

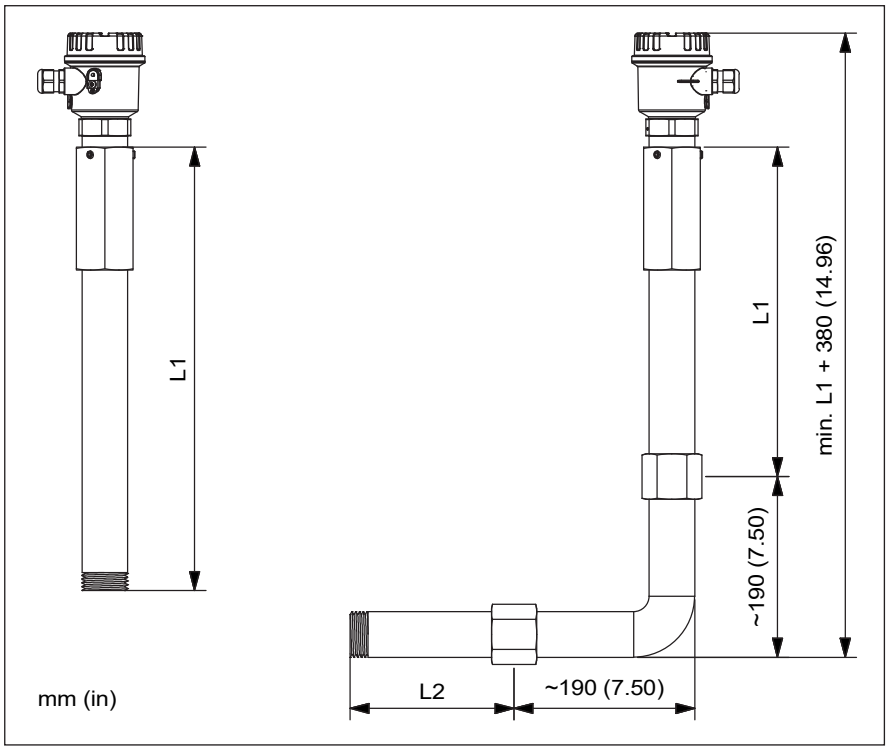


Figure 37: Dimensions of wave guide

High temperature adapter with length extensions

For mounting with connection thread in processes with temperatures up to max. +450°C (+842°F), the following high temperature adapters (SW55) and length extensions can be used (→ page 21):

- Order no. (high temperature adapter with flush-mounted ceramic disc and pressure equalization element):
  307384, thread R 1½/Rp 1½
  307385, thread 1½ NPT
- Order no. (extension):
  307386, thread R 1½/Rp 1½, L = 225 mm
  307387, thread R 1½/Rp 1½, L = 325 mm
  307388, thread R 1½/Rp 1½, L = 525 mm
  307390, thread 1½ NPT, L = 225 mm
  307391, thread 1½ NPT, L = 325 mm
  301747, thread 1½ NPT, L = 525 mm
- Material: Stainless steel 316Ti (1.4571)
- Weight:
  - High temperature adapter approx. 1.4 kg (3.09 lbs)
  - Extension 225 mm approx. 1.1 kg (2.43 lbs) to 525 mm approx. 2.2 kg (4.85 lbs)

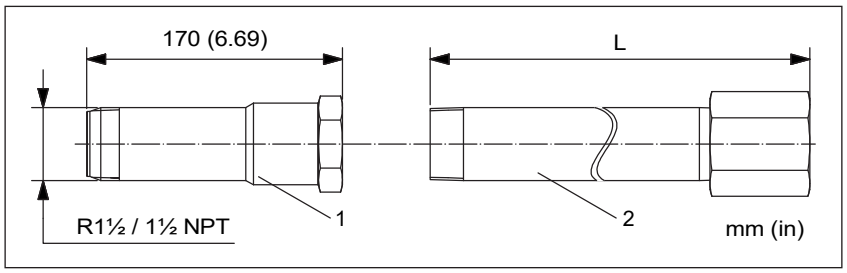


Figure 38: Dimensions of high temperature adapter and extensions

1 High temperature adapter
2 Extension

Technical data

Power supply

- 85 ... 253 VAC, 50/60 Hz (max. 4.8 VA)
- 20 ... 60 VDC (max. 2.2 W) oder 20 ... 30 VAC, 50/60 Hz (max. 3 VA)

Notice!
The electrical connection with Harting connector type HAN8D is only available for the power supply with 20 ... 60 VDC or 20 ... 30 VAC, 50/60 Hz.

Signal output

- Relay:
  - Switching capacity: 250 VAC / 4 A, 125 VDC / 0.4 A or 30 VDC / 4 A
  - Switching frequency: max. 2 Hz
- Solid-state relay:
  - Switching capacity 30 VAC / 0.4 A or 40 VDC / 0.4 A
  - Switching frequency: max. 2 Hz
- Current output
  - Output current: 4 ... 20 mA
  - Load: max. 600 Ω

Notice!
The maximum switching voltage for the Harting connector type HAN8D is 50 VAC.

Ambient conditions

- Ambient temperature: -40 to +70°C (-40 to +158°F)
- Ambient pressure: 80 to 110 kPa (0.8 to 1.1 bar) absolute

Process conditions

- Process temperaturer: -40 to +70°C (-40 to +158°F)
- Process pressure: 50 to 680 kPa (0.5 to 6.8 bar) absolute

Notice!
Using the optional accessories (→ page 33) the process conditions can be expanded:
- High temperature adapter: -40 to +450°C (-40 to +842°F)
- High pressure adapter: 50 to 2000 kPa (0.5 to 20 bar) absolute

Degree of protection

- IP 66 (with closed housing)
- IP 20 (with open housing)

Certifications

- EU-Type Examination Certificate (BVS 11 ATEX E 032)
  ATEX II 1/2D Ex ta/tb IIIC T102°C Da/Db IP66 / ATEX II 2D Ex tb IIIC T102°C Db IP66
- IECEx Certificate of Conformity (IECEx BVS 11.0016)
  IECEx Ex ta/tb IIIC T102°C Da/Db IP66 / IECEx Ex tb IIIC T102°C Db IP66
- CSA Certificate of Compliance (2609701)
  CSA C/US Class II, Div. 1, Group E-G
- EAC Certificate of Conformity (TC RU C-DE.AA87.B.01096)
  EAC Ex ta/tb IIIC T102°C Da/Db / EAC Ex tb IIIC T102°C Db

Subject to change!

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