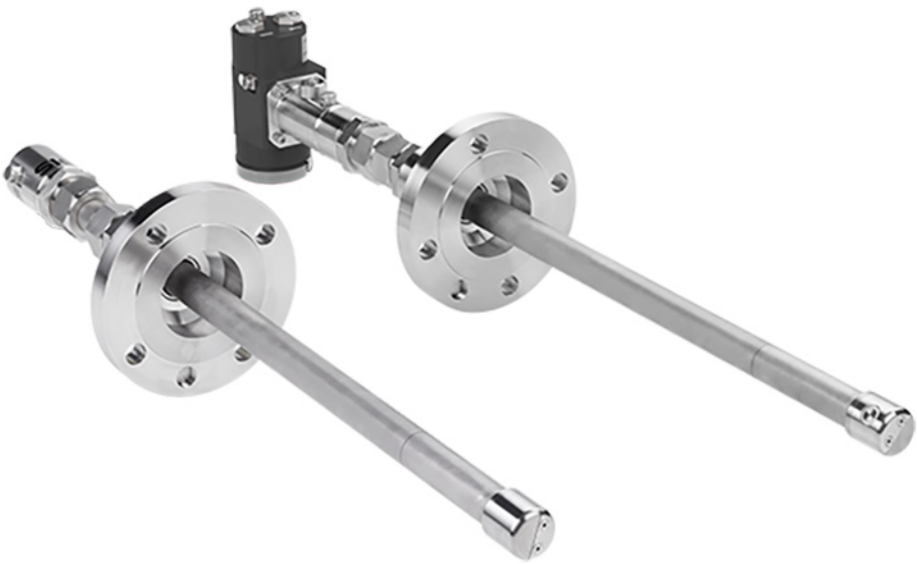
8030839/AE00/V1-0/2025-03

Operating Instructions
FLOWSIC100 Flare-XT/ Transmitter

Addendum for FLSE100-XT F1F-R



Endress+Hauser
People for Process Automation

Described product
Product name: FLOWSIC100 Flare-XT

Manufacturer
Endress+Hauser SICK GmbH+Co. KG
Bergener Ring 27
01458 Ottendorf-Okrilla
Germany

Legal information

Original document
This document is an original document of Endress+Hauser SICK GmbH+Co. KG.

Warning symbols

⚠ Warning

Warning levels / signal words

HAZARD
Risk or hazardous situation which *will* result in severe personal injury or death.

WARNING
Risk or hazardous situation which *could* result in severe personal injury or death.

CAUTION
Hazard or unsafe practice which *could* result in personal injury or property damage.

NOTICE
Hazard which *could* result in property damage.

Information symbols

Important technical information for this product

Important information on electric or electronic functions

Supplementary information

FLOWSIC100 Flare-XT

1 Important Information

General information
For your safety
Transport protection

1.1 General information

This document supplements and is to be used only in combination with the currently valid Operating Instructions:

- FLOWSIC100 Flare-XT (Part No. 8029806) when the F1F-R sender/receiver units are used with an Interface Unit,
- FLOWSIC100 Flare-XT Transmitter (Part No. 8029804) when the F1F-R sender/receiver units are used as stand-alone Transmitter.

Special instructions for the F1F-R sender/receiver units in this document overwrite related general information in the Operating Instructions FLOWSIC100 Flare-XT and FLOWSIC100 Flare-XT Transmitter.

1.2 For your safety

> **! NOTICE:**
> - ► Read the Operating Instructions carefully before using the device.
> - ► Special attention must be paid to all safety instructions and warnings for assembly, installation and operation of the device!

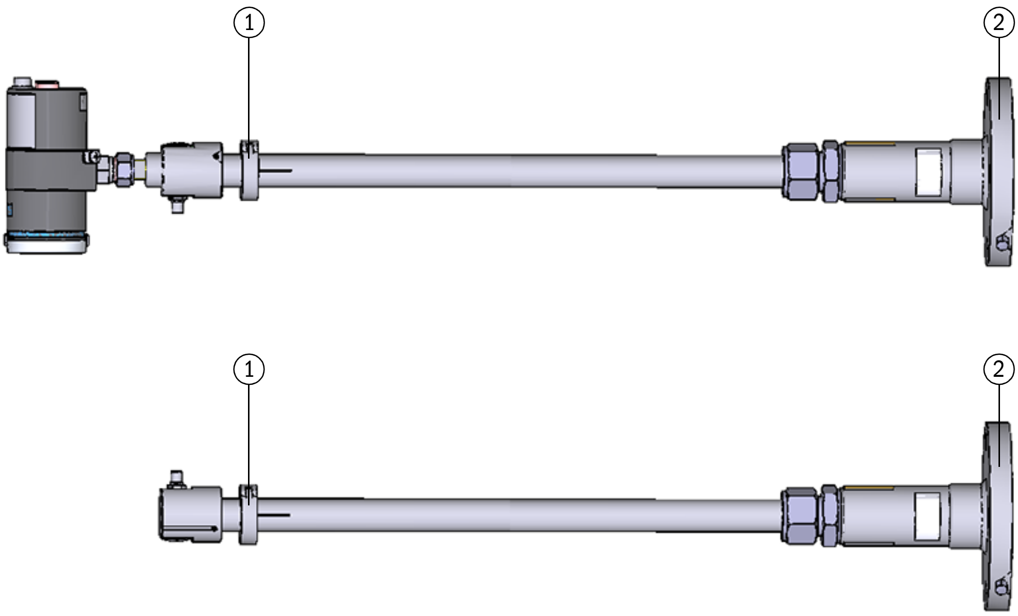
1.3 Transport protection

> **! NOTICE:**
> This section replaces:
> - § 5.5 “Transport protection” of the Operating Instructions FLOWSIC100 Flare-XT,
> - § 5.1 “Transport protection” of the Operating Instructions FLOWSIC100 Flare-XT Transmitter.

To prevent transport damage, the sender/receiver units must be secured before each transport according to → Fig. 1.

► The transducers must be fully retracted and secured in place with the safety clamp.

Fig. 1 Safety clamp



1 Safety clamp
2 Retraction flange

FLOWSIC100 Flare-XT

2 Product Description

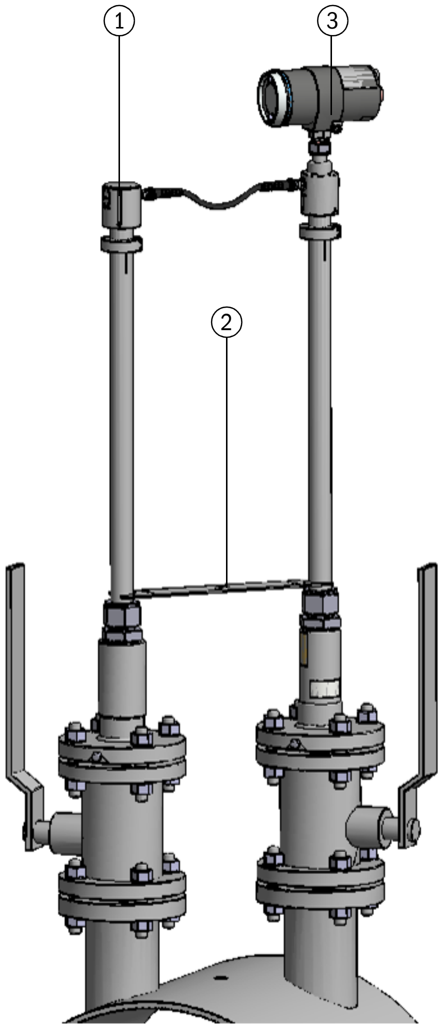
System overview
FLSE100-XT F1F-R sender/receiver units
Installation accessories

2.1 System overview

For installation of the sender/receiver units, the following components are required:

- F1F-R sender/receiver units
  For sending and receiving ultrasonic pulses, for signal processing and control of system functions
- Connection cable between the sender/receiver units
- Alignment tool for correct alignment of the sender/receiver units

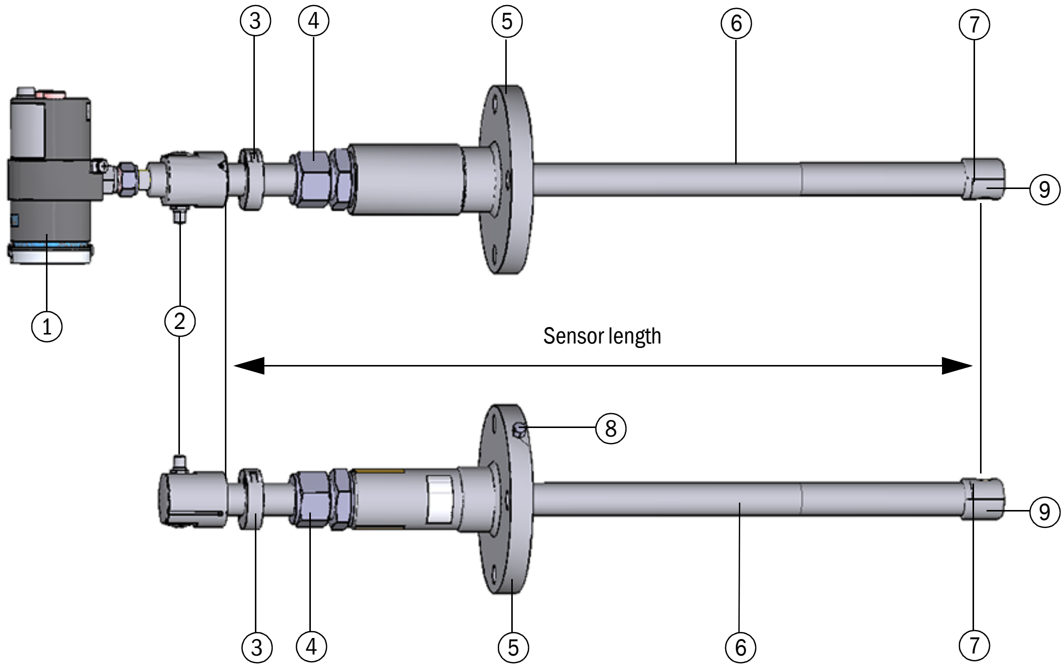
Fig. 2 F1F-R sender/receiver units



1 Sender/receiver unit (passive sensor)
2 Alignment tool
3 Sender/receiver unit (active sensor)

2.2 FLSE100-XT F1F-R sender/receiver units

Fig. 3 Schematic overview FLSE100-XT F1F-R sender/receiver unit



1 Electronics unit
2 Connection sender/receiver units
3 Safety clamp
4 Compression ring
5 Retraction flange
6 Duct probe
7 Transducer
8 Connection for optional venting
9 Sensor contour

Material for gas-affected parts (standard configuration)

Material	Component
Stainless steel	Connection for optional venting (8), retraction flange (5), sensor contour (9)
Titanium	Duct probe (6), transducer (7)
PTFE, with graphite	Sealing profile

2.3 Installation accessories

NOTICE:
This section replaces:
- § 5.6.6.2 “Installation Accessories - Ball valve“ of the Operating Instructions FLOWSIC100 Flare-XT,
- § 6.6.2 “Installation Accessories - Ball valve“ of the Operating Instructions FLOWSIC100 Flare-XT Transmitter.

Ball valve

The ball valve serves for safe separation of the sender/receiver units from the process and is required when the sender/receiver units are to be dismounted during the process. Endress+Hauser recommends using a ball valve.

NOTICE:
Observe the diagram on → p. 44, § 6.3.

Table 1 Ball valve according to ANSI

Component	Connection	Material (ASTM)	Gas temperature range
Standard temperature			
Ball valve CL150 3" SS	CL150 3"	Stainless steel 1.4408 (CF8M)	-46...+200°C (-50...+392°F)
Ball valve CL300 3" SS	CL300 3"	Stainless steel 1.4408 (CF8M)	-46...+200°C (-50...+392°F)
Low temperature			
Ball valve CL150 3" SS	CL150 3"	Stainless steel 1.4408 (CF8M)	-196...+200°C (-320...+392°F)
Ball valve CL300 3" SS	CL300 3"	Stainless steel 1.4408 (CF0M)	-196...+200°C (-320...+392°F)
High temperature			
Ball valve CL150 3" SS	CL150 3"	Stainless steel 1.4408 (CF8M)	-50...+400°C (-58...+752°F)
Ball valve CL300 3" SS	CL300 3"	Stainless steel 1.4408 (CF8M)	-50...+400°C (-58...+752°F)

FLOWSIC100 Flare-XT

3 Mounting and Installation

3.1 Overview

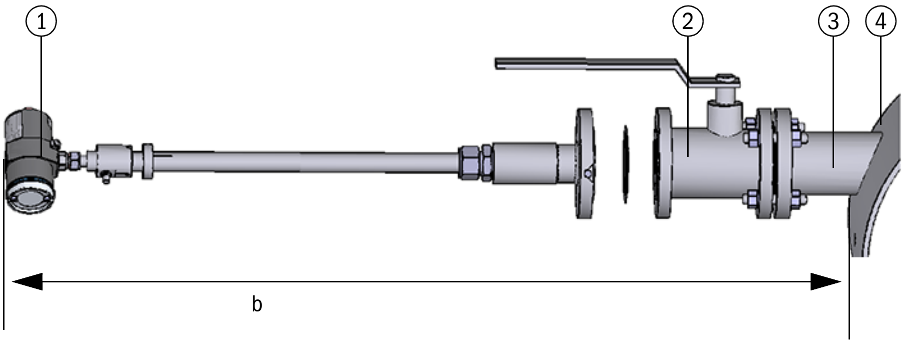
To install the FLSE100-XT F1F-R sender/receiver units, proceed as follows:

- ► Ensure suitable mounting conditions and sufficient clearance space for installation, → p. 14, § 3.2.
- ► Fit the nozzles on the pipeline, → p. 15, § 3.3.
- ► Determine the geometrical installation parameters, → p. 22, § 3.4.
- ► Install the sender/receiver units, → p. 25, § 3.5.

3.2 Clearance for fitting and removing the sender/receiver units

> ***NOTICE:***
> This section supplements:
> - § 4.2.5 “Clearance for fitting and removing the sender/receiver units“ of the Operating Instructions FLOWSIC100 Flare-XT,
> - § 4.2.5 “Clearance for fitting and removing the sender/receiver units“ of the Operating Instructions FLOWSIC100 Flare-XT Transmitter.

Fig. 4 Clearance for fitting and removing the sender/receiver units



1 Sender/receiver unit
2 Ball valve
3 Nozzle
4 Pipeline

Sender/receiver units designed to fit counter flange CL150 RF acc. ASME B16.5

Type	Type code	Retractable	b
			mm (inch)
FLSE100-XT F1F-R	F1F-R2	x	1048 (41.26) + length of ball valve and nozzle
	F1F-R4	x	1170 (46.06) + length of ball valve and nozzle
	F1F-R7	x	1292 (50.87) + length of ball valve and nozzle

3.3 Fitting the nozzles on the pipeline

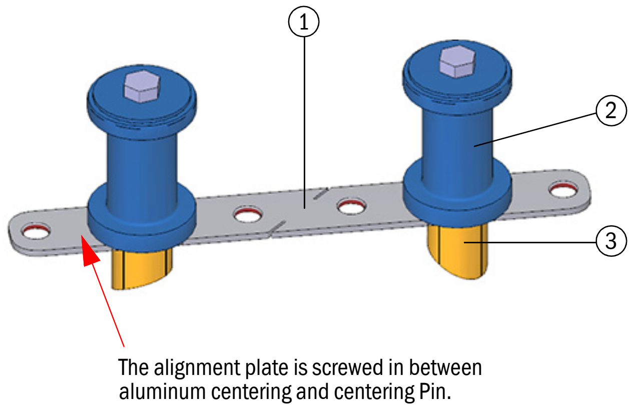
3.3.1 Required tools and accessories

- Nozzle installation kit:
  - welding tool
  - aluminum centering tool
  - alignment plate
- Nozzles (available from Endress+Hauser)

Not included in scope of delivery:

- Ball valves (optionally available)
- Hot tapping equipment
- Center finding device
- Blind flange (optionally available)

Fig. 5 Installation tool

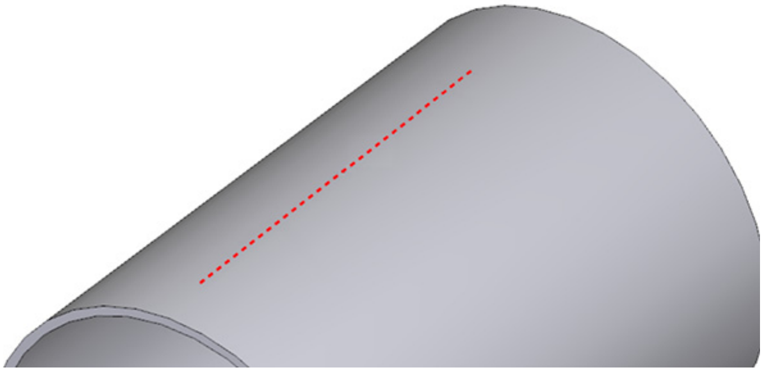


1 Alignment plate
2 Aluminum centering
3 Centering pin

3.3.2 Mounting the nozzles

1 Mark the center line of the pipeline. Use a center finding device to locate the center of the pipe. Do not estimate without proper tooling.

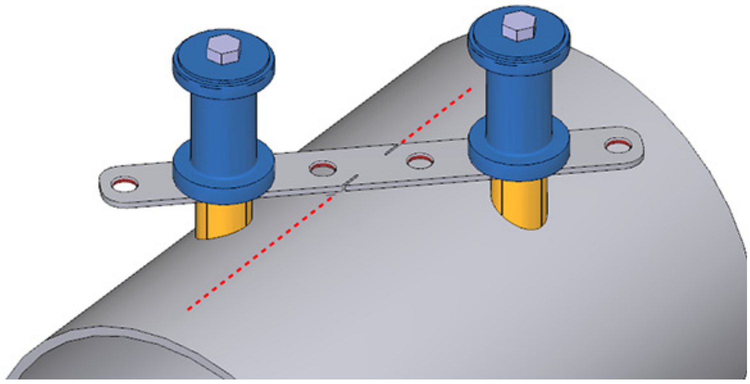
Fig. 6 Center line



2 Position the installation tool on the pipeline.

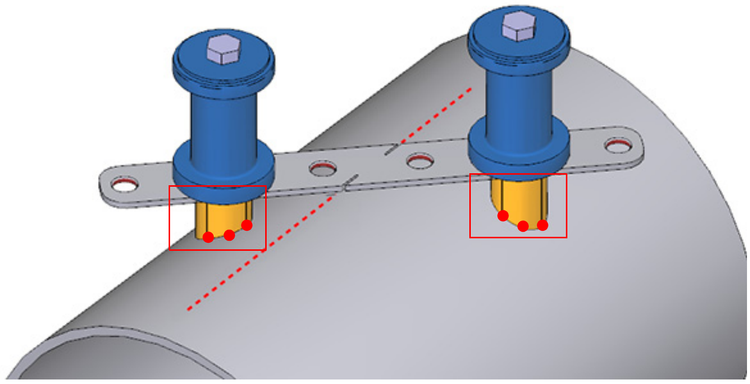
3 Align the installation tool along the slits in the alignment plate to the line drawn before.

Fig. 7 Installation tool on the pipeline



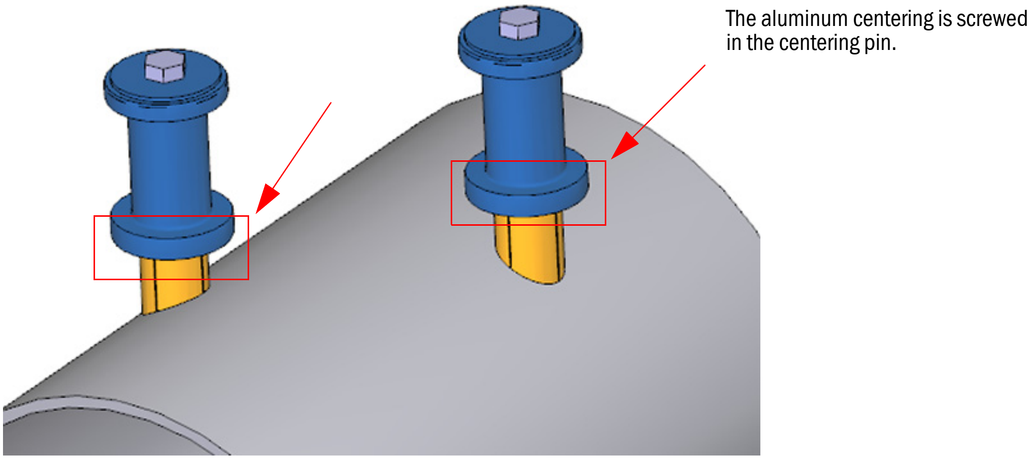
4 Weld the alignment tool in place; recommendation: several welding spots.

Fig. 8 Spot welding



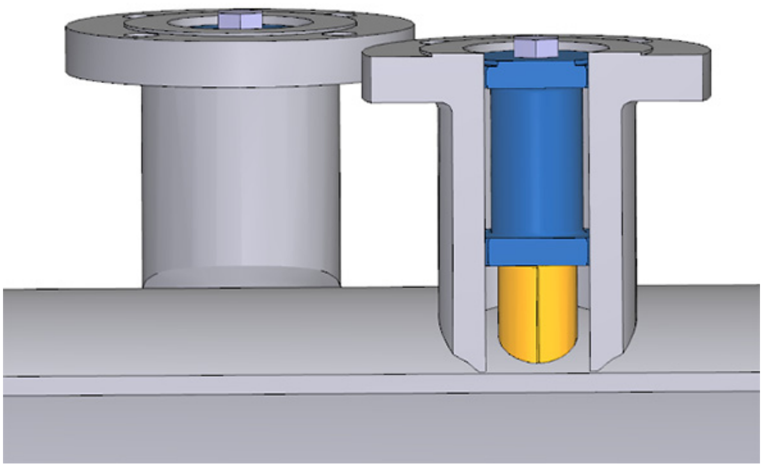
5 Unscrew the aluminum centering manually or alternatively release the M16 screw with a size 24 jaw wrench.
6 Remove the alignment plate.
7 Screw the aluminum centering back in.

Fig. 9 Alignment plate removed



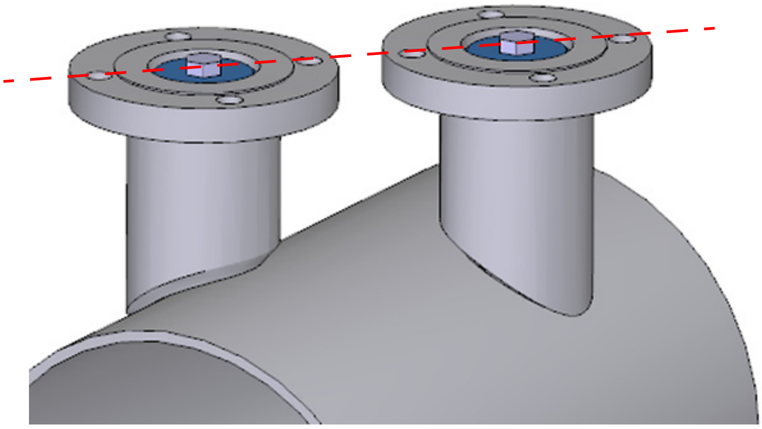
8 Slide the nozzles over the aluminum centering.

Fig. 10 Nozzles slided over aluminum centering (sectional view)



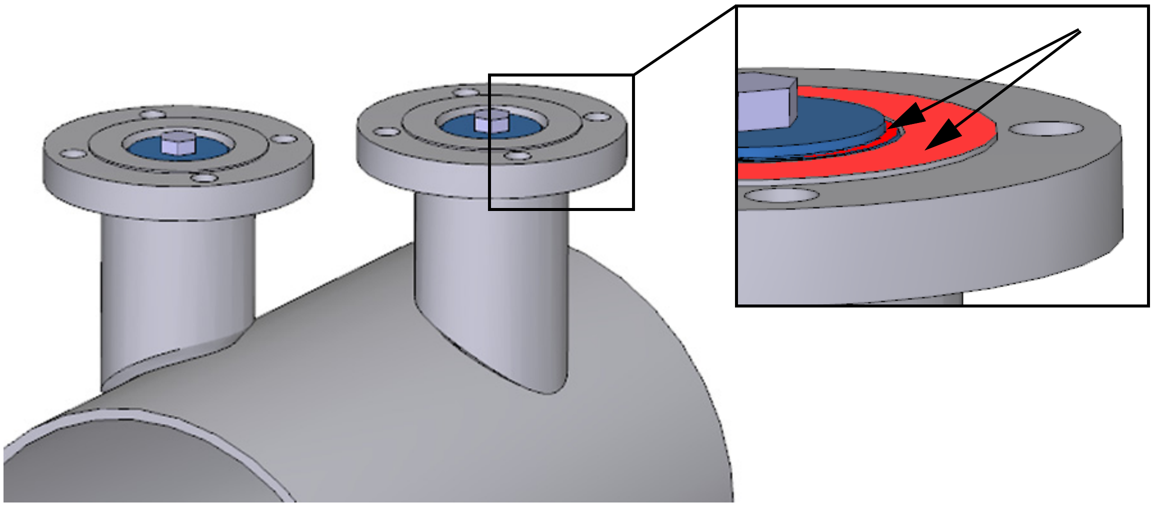
9 Make sure that the nozzles are aligned properly, → Fig. 11.

Fig. 11 Nozzle alignment



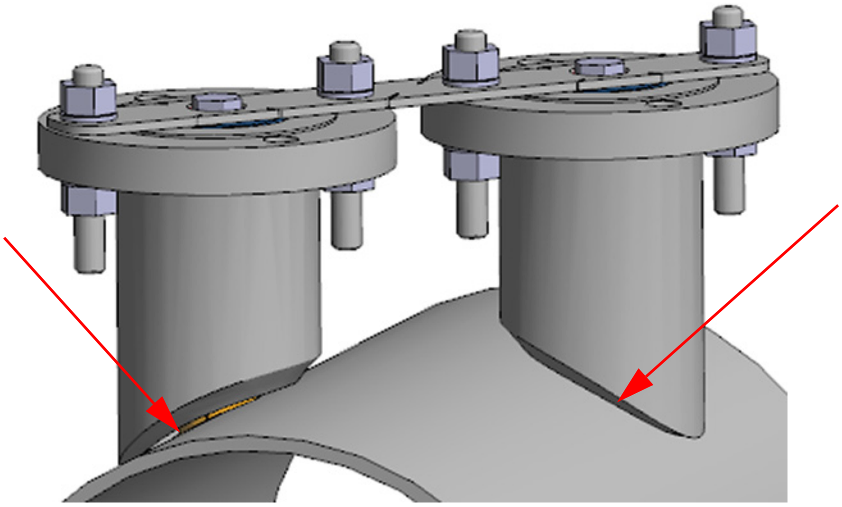
10 Release the M16 screw a few rotations till the lower surface of the aluminum centering is on the same level as the flange facing.

Fig. 12 Aluminum centering



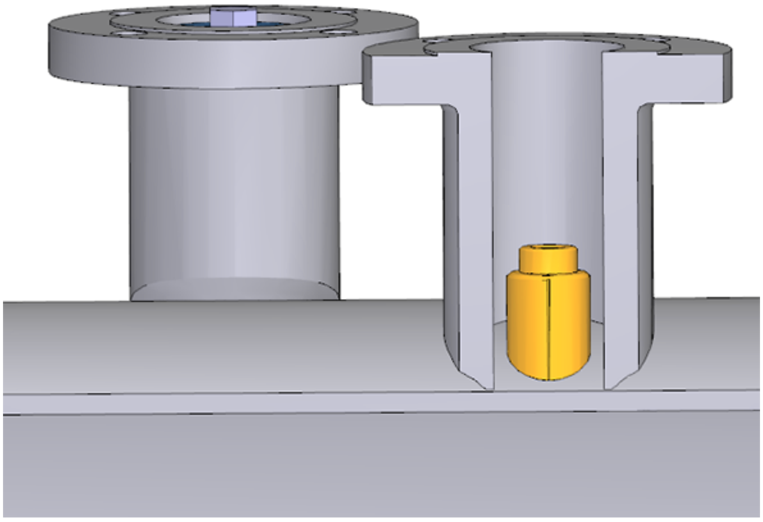
11 Fix the retaining plate on the aluminum centering with the provided bolts and nuts.
The nozzles are lifted up to ensure a sufficient welding gap of 3 mm, → Fig. 13.

Fig. 13 Welding gap



12 Weld the nozzles to the pipeline (full penetration welding).
13 Remove the alignment plate.
14 Remove the aluminum centering.

Fig. 14 Aluminum centering removed (sectional view)

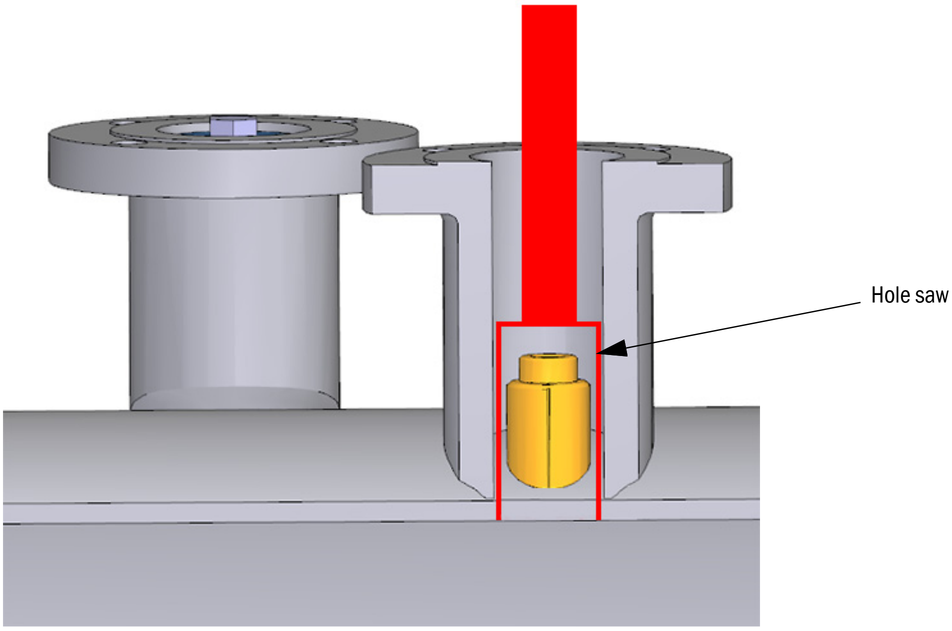


15 Mount the ball valves including gaskets (not included in the scope of delivery).
For non hot tapping installations the valve can be installed after drilling.
16 For hot tapping the pipe, proceed as described in → p. 21, § 3.3.3.

Non hot tapping installation

► Drill the hole for the nozzle.
  Required hole cutter dimension see → p. 21, § 3.3.3.

Fig. 15 Coupon retaining hole saw (sectional view)



3.3.3 Hot tapping the pipe

Hot-tapping work requires special tools (e.g. special drilling tool) and special technical knowledge. Special attention must be paid to all safety instructions and warnings for welding and hot tapping

WARNING: **Hazards during hot tapping**
- Only have the hot tapping work done by skilled persons qualified for hot tapping.
- Comply with all legal, general and company-internal regulations.
- Only start installation work when all planned measures have been checked and approved by the plant operator.

WARNING: **Gas hazard**
- Activities on equipment with increased hazard potential, e.g. by toxic, aggressive, explosive gases, health endangering, higher pressure, high temperatures, low temperature (cryogenic), have to follow legitimate regulations, general standards and guidelines as well as plant operator instructions. Only authorized personnel with special qualification for the "hot tapping" method may fit devices on running equipment Otherwise, serious injuries might occur, e.g. poisoning, burns etc.

  These persons must be trained and technically adept in "hot tapping" installation work and must know and implement legal as well as generally applicable regulations and in-house regulations.
- The express approval of the plant operator in written form is required for installations on running equipment at all times. The plant operator carries the responsibility for professional implementation alone. All safety requirements relevant for the equipment must be observed as well as essential and suitable protective measures taken. All regulations/special regulations that can be applicable for the plant must be observed.

Requirements to the hot tapping drill /Required hole cutter dimension:
- Use a coupon retaining hole saw.
- The hole cutter diameter must be 2,5".
- The drill depth of the hot tap drill must be at least 3". For 14 and 16 " pipes, the recommended hot tap drill depth ist 3,5".

Procedure
1 Mount the hot tapping tool on the ball valve.
2 Open the ball valve.
3 Drill out the holes in the pipeline.
4 Start drilling till breakthrough.
5 Retract the drilling tool.
6 Close the ball valves and secure against unintentional activation.

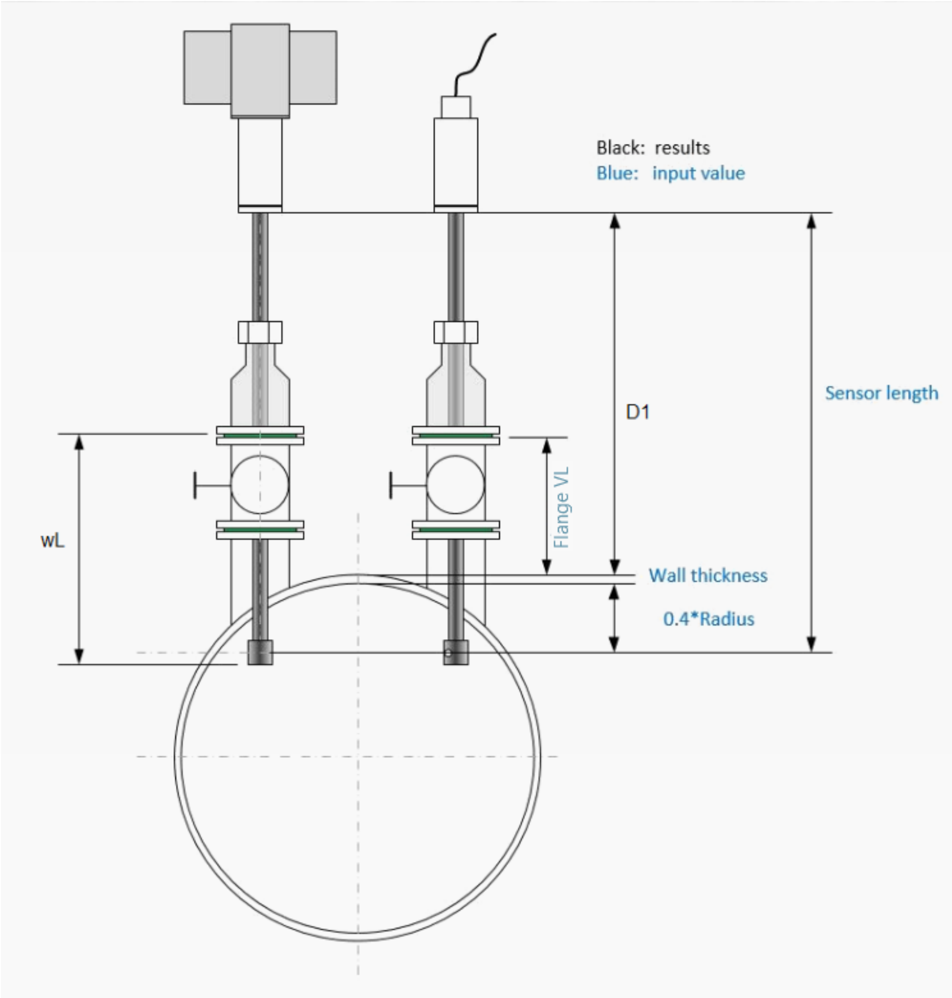
WARNING: **Accident risk**
- Keep the ball valve closed and fitted until a sender/receiver unit has been fitted.
- Secure the ball valve against unintentional activation.
- Instruct other persons accordingly.

7 Release the rest of the gas volume from the hot tapping tool.
8 Remove the hot tapping tool.
9 Mount a blind flange or proceed with mounting the sender/receiver units.

3.4 Determining the geometrical installation parameters

For the correct installation of the sender and receiver units, the Setup Distance D1 needs to be calculated.

Fig. 16 Overview



Calculation input values

> ❗ ***NOTICE:* Maximum tolerances**
> - Maximum tolerances of the input values dimensions.
> - Maximum tolerance ± 1 mm / ± 1°

> ❗ ***NOTICE:***
> Note circumference U, the wall thickness w and flange length VL; these values are required for calculating the path angle and path length with FLOWgate™ during commissioning.

- Ultrasonic sensor type
  The type of the installed ultrasonic sensors has to be set. You can find the type description on the type plate of the ultrasonic sensor.

Type code	Nominal Pipe Size
F1F-R2 ...	Up to 24"
F1F-R4 ...	Up to 48"
F1F-R7...	Up to 72"

- Sensor length
  Endress+Hauser supports three different standard lengths to achieve an optimized installation space referring to the pipe size. The sensor length is defined from the bottom of the metal screw till the center point of the membrane. The geometry calculator sets the correct sensor length automatically when choosing the installed ultrasonic sensor type.
- Pipe Circumference [U]
  Measure the outer circumference of the pipe with a measuring tape.
- Wall thickness [w]
  The wall thickness can be found in the commissioning documentation or in the program parameter sheet of the existing flare meter.

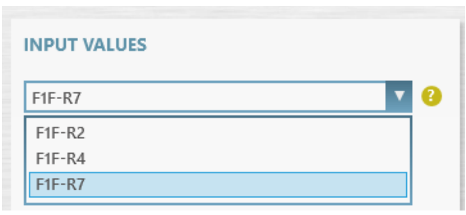
Calculating the Setup Distance D1 for F1F-R

> Setup Distance [D1] = Sensor length - Wall thickness - 0.4 * Radius (inside)

Calculate the Setup Distance with the geometry calculator in FLOWgate™

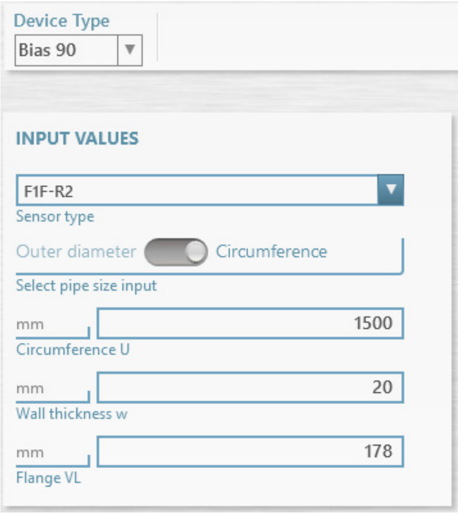
1 Start the FLOWgate™ operating software.
2 Create a FLOWSIC100 Flare-XT offline device.
3 Open the “Geometry calculator” tile in the “Change parameters” menu.
4 Select the “Bias 90” device type.

5 Select the sensor type.



The geometry calculator sets the correct sensor length automatically when choosing the sensor type.

6 Enter circumference U, the wall thickness w and the flange length VL in the “Input values” section.



7 Click “Calculate parameter values”.

The results of the calculation are needed for the correct installation (→ p. 25, § 3.5) and commissioning (→ p. 34, § 4.1) of the FLSE100-XT F1F-R sender/receiver units.

3.5 Assembly

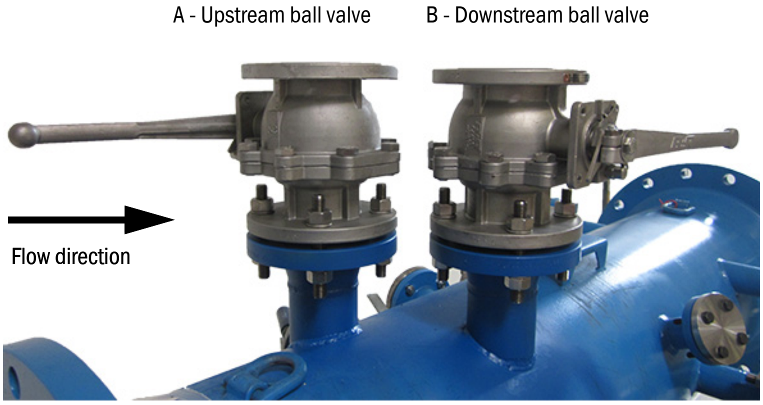
3.5.1 Prerequisites for assembly

- ► The pressure in the pipe line does not exceed the maximum installation pressure of 0.5 bar (g).

WARNING: Maximum pressure for use of the retraction mechanism
- ► Maximum pressure for use of retraction mechanism: 0.5 bar (g)
- ► Installation/demounting is possible up to 8 bar (g) with an additional extraction tool (available on request).

- ► Preparation work has been completed, → p. 22, § 3.4.

Fig. 17 Measurement point prepared for retrofit



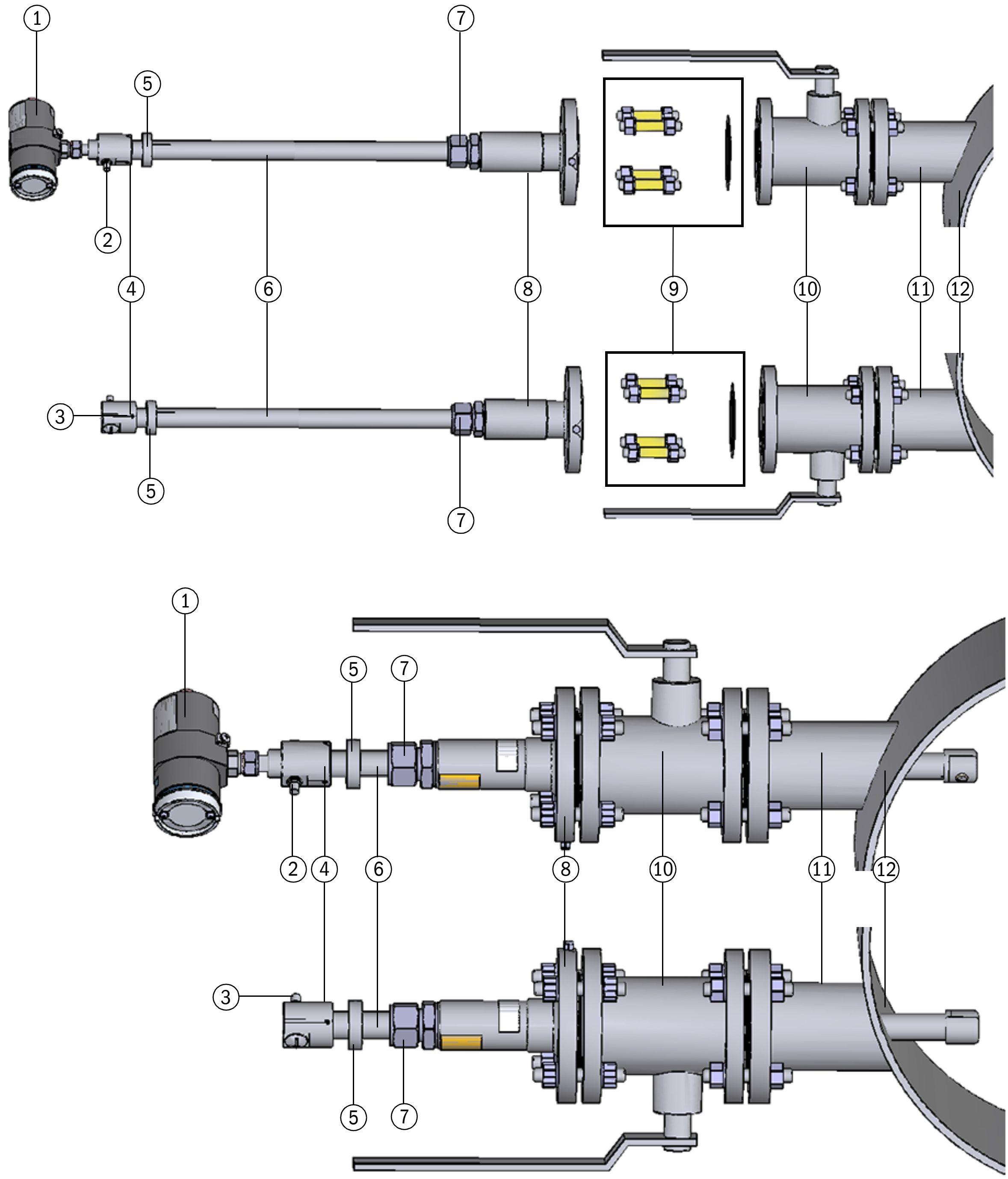
3.5.2 Tools required

- Jaw wrench size 24
- Jaw wrench size 50
- Allen key size 4
- Folding rule

3.5.3 Fitting the sender/receiver units

NOTICE:
- ► Observe the notes given for the installation of the sender/receiver units in:
  - § 5.6.8 “Fitting the sender/receiver units“ of the Operating Instructions FLOWSIC100 Flare-XT,
  - § 6.8 “Fitting the sender/receiver units“ of the Operating Instructions FLOWSIC100 Flare-XT Transmitter,
- ► Observe the safety notes given in:
  - § 5.2 “Safety information“ of the Operating Instructions FLOWSIC100 Flare-XT,
  - § 2 “For your safety“ of the Operating Instructions FLOWSIC100 Flare-XT Transmitter.

Fig. 18 Overview

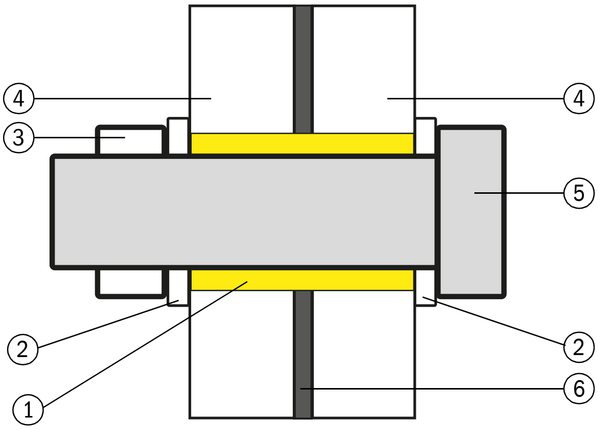


1 Electronics unit
2 Connection to sender/receiver unit (passive sensor)
3 Connection to sender/receiver unit (active sensor)
4 Electronics neck
5 Safety clamp
6 Duct probe
7 Clamping ring screw connection
8 Retraction flange
9 Mounting kit (including gasket, fastening screws, nuts, washers and alignment sleeves)
10 Ball valve
11 Nozzle
12 Pipeline

Use of the alignment sleeves

The alignment sleeves are included in the mounting kit and serve to ensure the centering of the process flanges of the sender/receiver units.

Fig. 19 Alignment sleeves



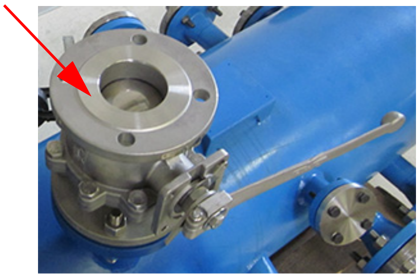
1 Alignment sleeve
2 Washer
3 Nut
4 Flange
5 Fastening screw
6 Gasket

Installing the sender/receiver units

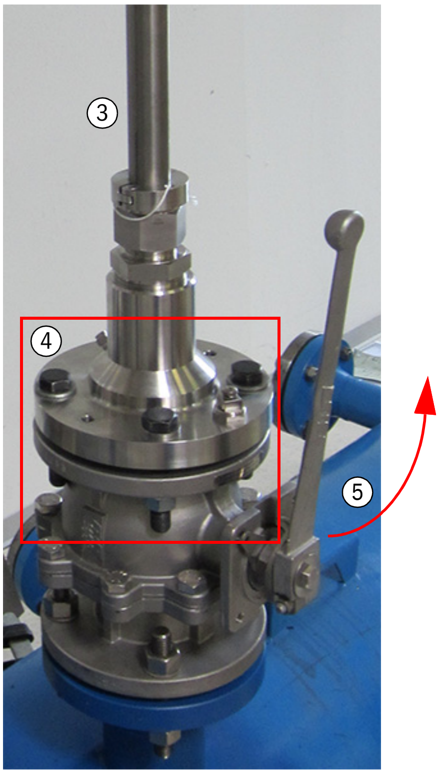
► To install the sender/receiver units, proceed as follows:

NOTICE:
Endress+Hauser recommends to install the sender/receiver units with two persons.

1 Make sure the ball valves are closed.
  ► If applicable, close ball valves.
  ► If applicable, remove blind flange.
2 Position the graphite seal.



3 Install the passive sender/receiver unit (without electronics head) into the downstream ball valve:
  ► Position the probe on the downstream nozzle.
  ► Make sure the graphite seal does not move during positioning.
4 Insert the four bolts and secure in place with jaw wrench size 24.
  Apply a tightening torque according to:
  – Operating Instructions FLOWSIC100 Flare-XT, § 15.6 “Gasket installation“,
  – Operating Instructions FLOWSIC100 Flare-XT Transmitter, § 15.4 “Gasket installation“.
5 Open the ball valve.



WARNING:
If gas escapes, do not continue, close the ball valve again and contact Endress+Hauser Service.

NOTICE:
The clamping ring screw connection has not yet been tightened.
► Secure the probe with one hand while the safety clamp is released. The probe can be damaged when it slides in uncontrolled.

6 Loosen the safety clamp with an Allen key size 4.

7 Push the probe carefully into the pipe into the correct position.

For the correct distance, see → p. 22, § 3.4 “Setup Distance [D1]”.

Make sure, the probe does not slide in too far, otherwise the probe could be damaged.

8 Use the safety clamp to secure the probe in place.

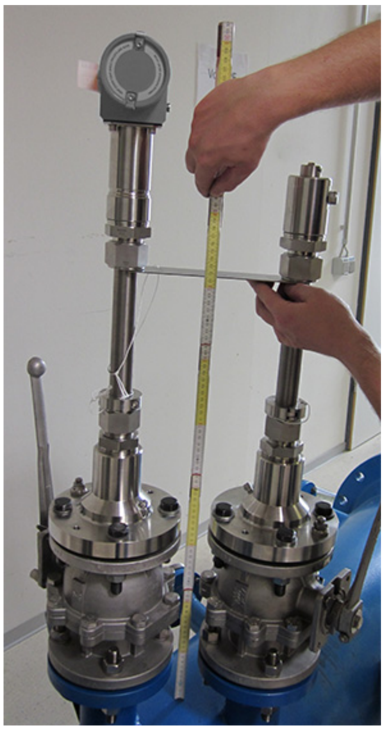
9 Install the active sensor (probe with electronics head) into the upstream ball valve as described before.

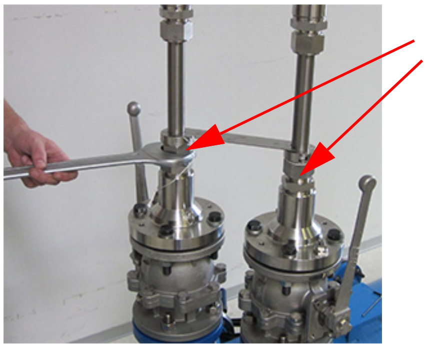
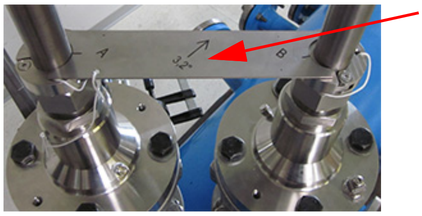
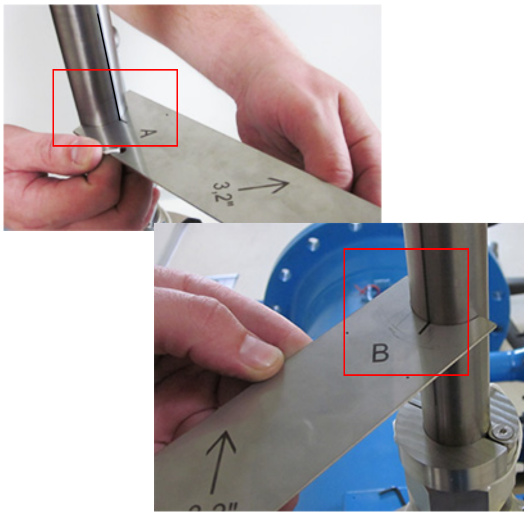
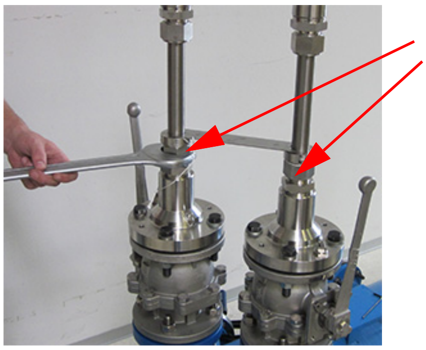
10 Select the alignment tool from the mounting kit.

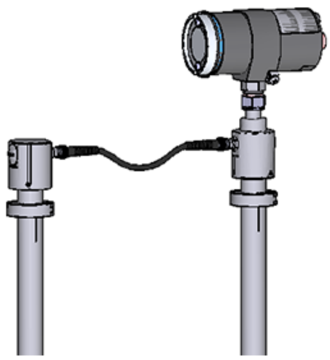
There are three different alignment tools available. Select the fitting alignment tool for the nozzle distance of your installation.

11 Make sure both probes were inserted into the pipe by the same distance (→ p. 22, § 3.4 “Setup Distance [D1]”).

If you have to correct the distance, Endress+Hauser recommends to secure the probes with the safety clamps and correct the distance of both probes alternating in small steps until the right distance has been ensured.



12 Secure the clamping ring in place: ► First tighten the clamping ring screw connection hand-tight. ► Turn with a size 50 jaw wrench a further half turn. ► Then release the clamping ring screw connection a half turn again. **13** Repeat for second probe.	
14 Position the alignment tool so that the arrow points in flow direction.	
15 The markings must match on the probes and the alignment tool: If necessary, turn the probes to ensure correct alignment. **16** Make sure that the Setup Distance [D1] is still correct.	
17 Tighten the clamping ring screw connection a half turn with a size 50 jaw wrench again.	

18 Fasten the alignment tool under the transport protection. Make sure the loss protection of the alignment tool is not trapped.	
19 After installation, perform a leak tightness check by appropriate means, e.g. leak detection spray.	
20 Interconnect active and passive sender/receiver unit.	
21 For F1F-R used with Interface Unit: Mount the Interface Unit as described in the Operating Instructions FLOWSIC100 Flare-XT § 6.4 “Installation“. **22** Proceed with the electrical installation as described in: – Operating Instructions FLOWSIC100 Flare-XT, § 6.5 “Electrical Installation“, – Operating Instructions FLOWSIC100 Flare-XT Transmitter, § 7 “Electrical Installation“.	

FLOWSIC100 Flare-XT

4 Commissioning

Sequence of start-up

Commissioning with the FLOWgate™ operating software

4.1 Sequence of start-up

Follow the commissioning instructions:

- in the Operating Instructions FLOWSIC100 Flare-XT
  § 7 "Commissioning FLOWSIC100 Flare-XT",
- in the Operating Instructions FLOWSIC100 Flare-XT Transmitter § 8 "Commissioning".

4.2 Commissioning with the FLOWgate™ operating software

> **!** *NOTICE:*
> This section replaces:
> - § 7.5.4 "Installation" of the Operating Instructions FLOWSIC100 Flare-XT,
> - § 8.5.4 "Installation" of the Operating Instructions FLOWSIC100 Flare-XT Transmitter.

Exact values for geometrical installation parameters must be calculated to lower the uncertainty of measurement:

The following parameters must be calculated:

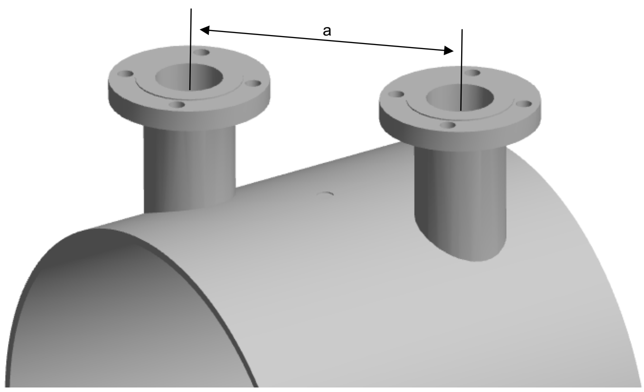
- Path Length between ultrasonic transducers [L]
- Path Angle between ultrasonic transducers [α]
- Pipe Diameter [di]
- Cross section Area of the pipe [A]

Calculation input values

> **!** *NOTICE:* **Maximum tolerances**
> - Maximum tolerances of the input values dimensions.
> - Maximum tolerance ± 1 mm / ± 1 °

- Nozzle Distance [a]: Distance between the two mid-points of the existing weld-on nozzles. Measure this value as shown in → Fig. 20.

Fig. 20 Nozzle Distance [a]



- Ray Rescue Angle [β]

  For an optimized adjusted measuring system for high velocities a turning of sensor B is recommended. A ray rescue angle of 12° should be realized. The delivered alignment tool can be used for easy adjustment during mechanical installation.
- Nominal path angle [γ]

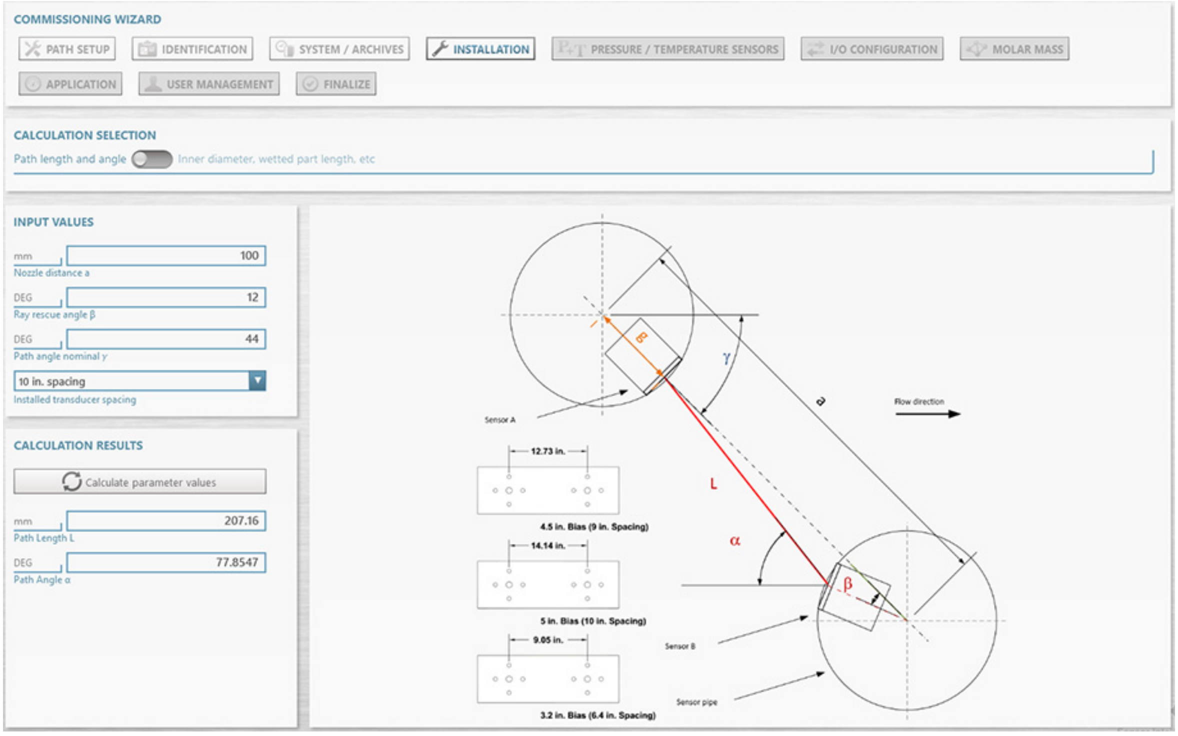
The nominal path angle is defined by the center point of the nozzle of sensor a referring to the axial pipe direction. This value will be used for calculation of path length and real path angle α.

- Real path angle [α]
  Real path angle is defined by the center points of the sensor membranes referring to the axial pipe direction. This value is different to the Nominal path angle because of the used ray rescue angle. It has to be entered in the FLOWgate™ software for firmware configuration of the whole system.

Calculating Path length and Path angle

1 Make sure, the slider is set to “Path length and angle”.
2 Enter the input values.
3 Select the correct transducer spacing of the installed sensor type.
4 Click “Calculate parameter values”
  Path Length L and Path Angle α are calculated.

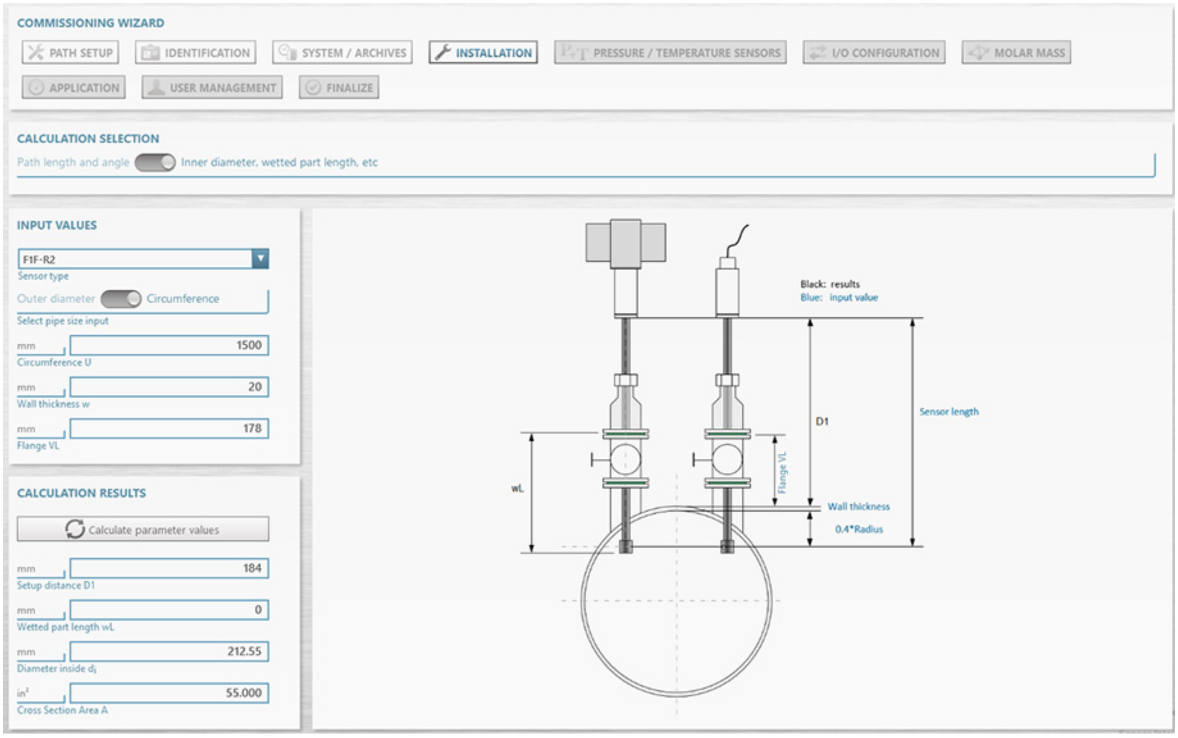
Fig. 21 Calculating Path Length L and Path Angle α



Calculating Pipe Diameter and Cross section Area

1 Set the slider to “Inner diameter, wetted part length etc.”
2 Select the installed sensor type.
3 Enter the parameters determined in §3.4 “Determining the geometrical installation parameters”.
4 Click “Calculate parameter values”
 Pipe Diameter [di] and Cross section Area of the pipe [A] are calculated
 Make sure that the calculated values for the calculated parameters match the values calculated in §3.4.

Fig. 22 Calculating Pipe Diameter [di] and Cross section Area of the pipe [A]



Proceed with commissioning as described in the Operating Instructions FLOWSIC100 Flare-XT or FLOWSIC100 Flare-XT Transmitter.

FLOWSIC100 Flare-XT

5 Maintenance

Removing the sender/receiver units

5.1 Removing the sender/receiver units

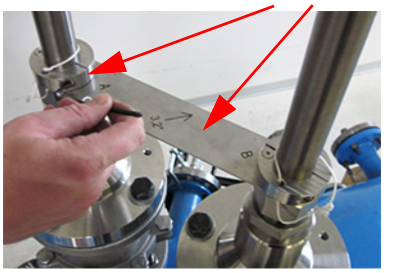
⚠	**WARNING:** Maximum pressure for use of the retraction mechanism ► Maximum pressure for use of retraction mechanism: 0.5 bar (g) ► Installation/demounting is possible up to 8 bar (g) with an additional extraction tool (available on request).

1 Remove all electrical connections.

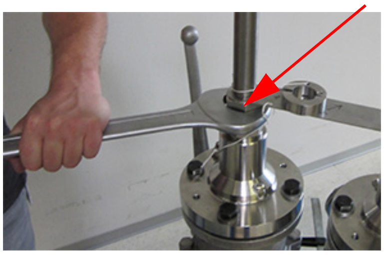
NOTICE:

► Do not close the ball valves yet!
The sender receiver units have not been retracted yet and will be damaged when closing the ball valve.

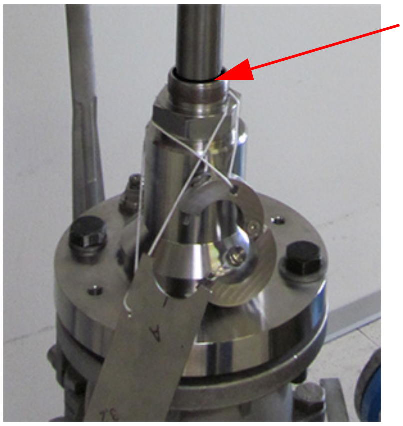
2 Remove safety clamp and alignment tool.



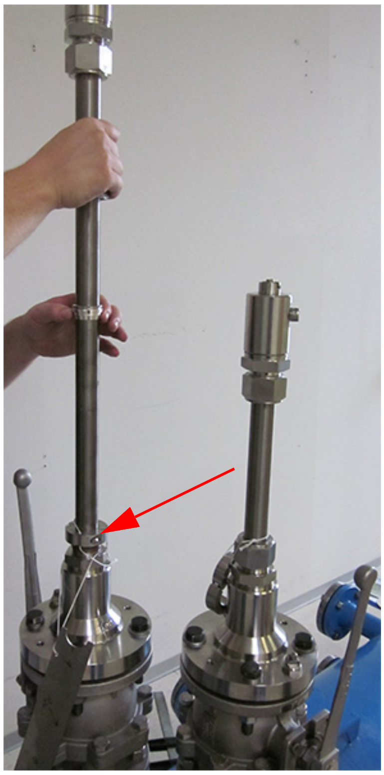
3 Fully unscrew the clamping ring screw connection.



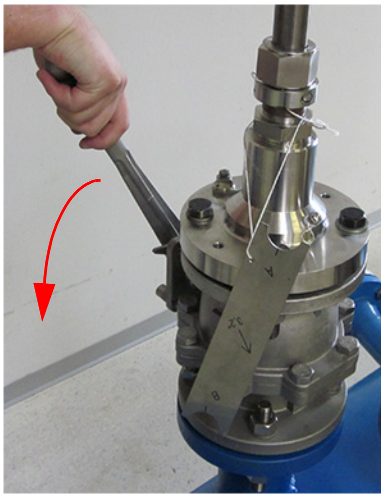
4 Fully pull out the probe to the stop (audibly).
The probe has been fully retracted when the marking on the duct probe is visible.



5 Secure the probe with the safety clamp in place.
Make sure that the probe does not slide back into the pipeline.
Perform for both probes.

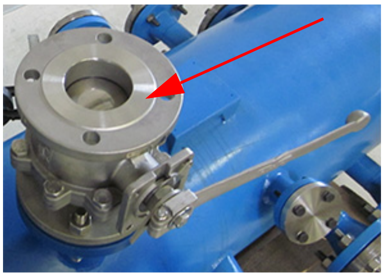


6 Close the ball valve.



NOTICE:
It must be possible to close the ball valve without resistance.
If this is not possible:

► Make sure the probe has been pulled out fully.

7 Unscrew the flange bolts. 8 Remove the sender /receiver unit from the ball valve.	
9 Remove the graphite seal. 10 If applicable, fit a sealing and a blind flange.	

! *NOTICE:*
If the sender/receiver units shall be installed again, make sure, the clamping ring stays in the correct position and does not slide back.

FLOWSIC100 Flare-XT

6 Specifications

Technical data FLSE100-XT F1F-R
Dimensional drawings

6.1 Technical data FLSE100-XT F1F-R

> **NOTICE:**
> This sections supplements:
> – § 12.2 “FLSE100-XT sender/receiver units” of the Operating Instructions FLOWSIC100 Flare-XT,
> – § 12.1 “Technical data FLOWSIC100 Flare-XT Transmitter” of the Operating Instructions FLOWSIC100 Flare-XT Transmitter.

Table 2 Technical data F1F-R

Measuring conditions	
Operating pressure:[1]	CL150 device flange: 20 bar (g) (290 psi(g))
	PN25 device flange (optional): 20 bar (g) (290 psi(g))
	CL300 device flange (optional). 20 bar (g) (290 psi(g))
Gas temperature	–196 °C ... +280 °C (–320 °F ... +536 °F)
Ex approvals	
IECEx	Ex db [ia Ga] IIA T4 Ga/Gb Ex db [Ia Ga] IIB T4 Ga/Gb **Ex db [ia Ga] IIC T6/T4 Ga/Gb** Ex ia IIC T6/T4 Ga
ATEX	II 1/2G Ex db [ia Ga] IIA T4 Ga/Gb II 1/2G Ex db [Ia Ga] IIB T4 Ga/Gb **II 1/2G Ex db [ia Ga] IIC T6/T4 Ga/Gb** II 1G Ex ia IIC T6/T4 Ga
NEC/CEC (US/CA)	Class I, Division 1, Group D, T4; Class I, Zone 1, Ex/AEx d[ia] IIA, T4; Class I, Division 2, Group D, T4; Class I, Zone 2, Ex/AEx nA[ia] IIA, T4 Class I, Division 1, Groups C and D, T4; Class I, Zone 1, Ex/AEx d[ia] IIB, T4; Class I, Division 2, Groups C and D, T4; Class I, Zone 2, Ex/AEx nA[ia] IIB, T4 **Class I, Division 1, Groups B, C and D, T4;** **Class I, Zone 1, Ex/AEx d[ia] IIB + H2, T4;** **Class I, Division 2, Groups A, B, C and D, T4;** **Class I, Zone 2, Ex/AEx nA[ia] IIC, T4**
Installation	
Weight	≤ 12 kg (26 lbs) (pair of ultrasonic sensors)

[1] Temperature-dependent, for details see § 6.3 “Derating pressure resistance”

6.2 Dimensional drawings

Fig. 23 Dimensions FLS100-XT F1F-R in mm (inch)

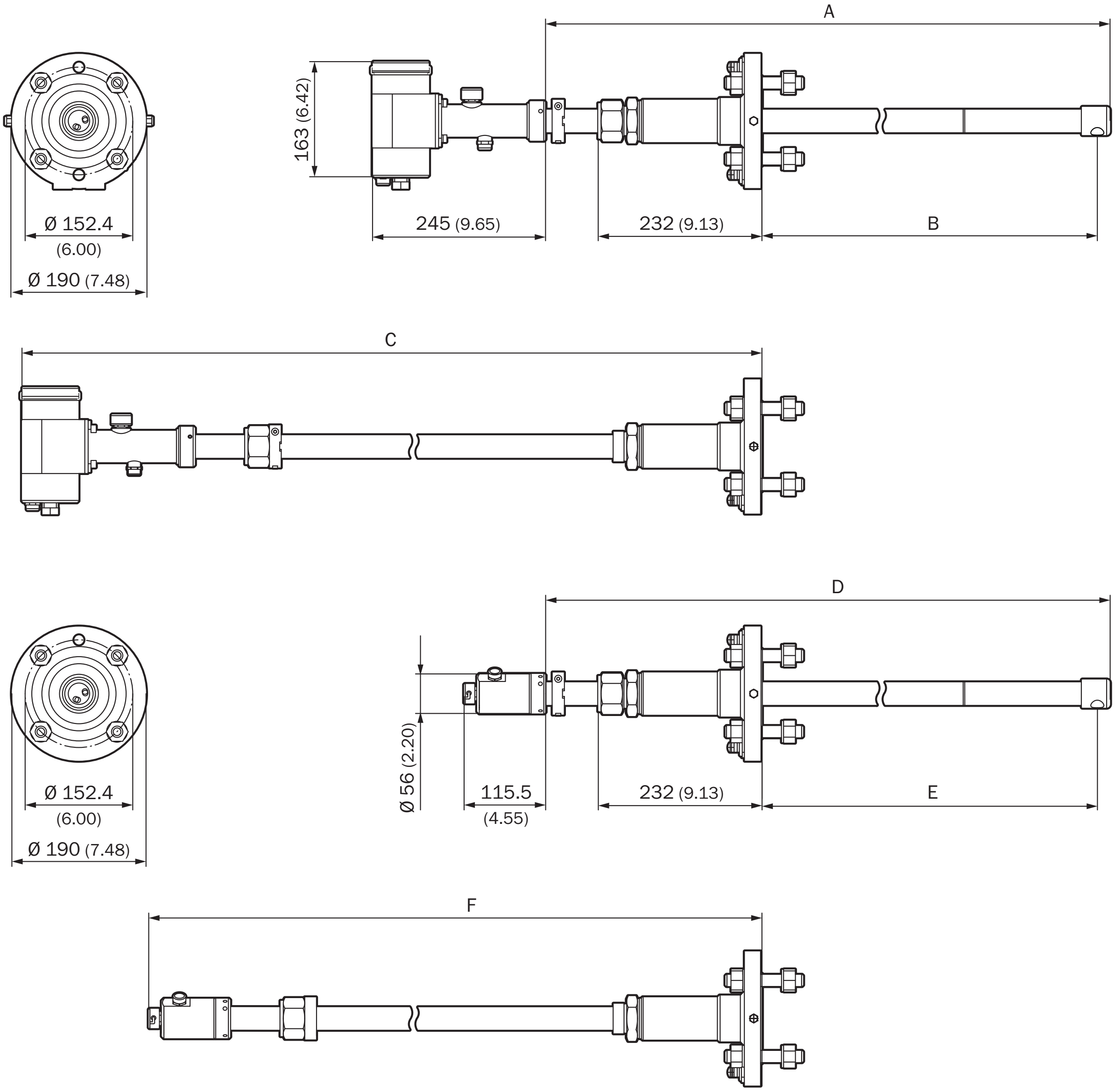


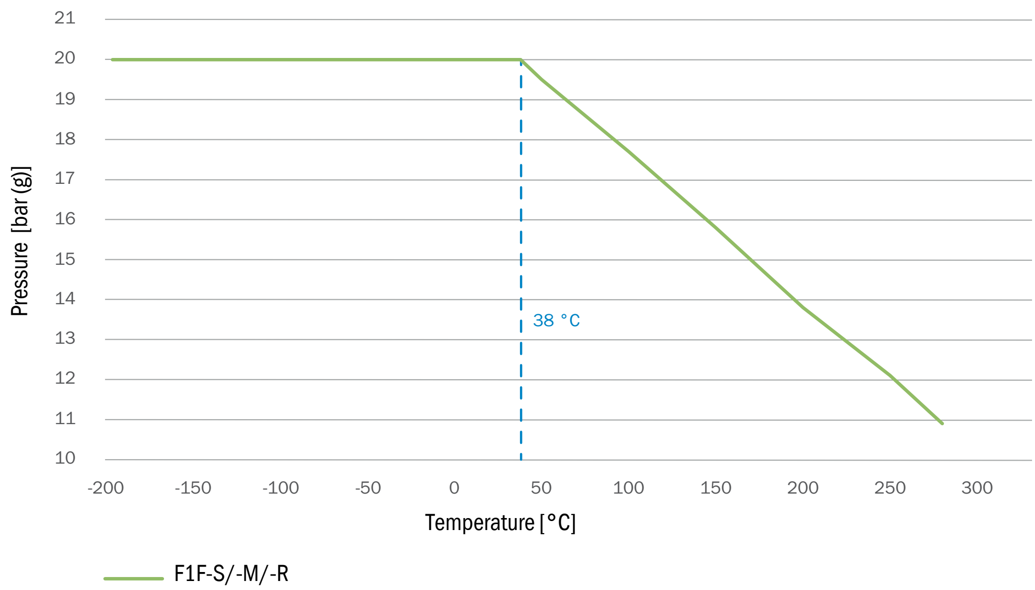
Table 3 Dimensions FLSE100-XT F1F-R

F1F-R	Dimensions in mm (inch)					
	A	B	C	D	E	F
Up to 24"	800 (31.5)	475 (18.7)	1,048 (41.25)	800 (31.5)	475 (18.7)	869 (34.2)
Up to 48"	922 (36.3)	597 (23.5)	1,170 (46.1)	922 (36.3)	597 (23.5)	991 (39.0)
Up to 86"	1,044 (41.1)	719 (28.3)	1,292 (50.9)	1,044 (41.1)	719 (28.3)	1,113 (43.8)

6.3 Derating pressure resistance

> ***NOTICE:***
> The diagrams apply to the standard variants of the FLSE100-XT sender/receiver units. Deviations in other versions are possible.
> Observe the maximum permissible design values shown on the type plates of the devices.

Fig. 24 F1F-S/-M/-R



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