MOUNTING AND OPERATING INSTRUCTIONS

EB 27c

Translation of the original manual

Sampling valve BR 27c • DIN and ANSI version

Continuous sampling valve to combine with actuator and specific accessories for sampling

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Note regarding this installation and operating manual

This Installation and Operating Manual (EB) provides guidance for safe assembly and operation.

The notes and instructions in this EB are binding when handling PFEIFFER devices. The figures and illustrations in this EB are examples and must therefore be considered as such.

⇨ For safe and correct use, read this EB carefully prior to use and keep it for later reference.

⇨ In the case of questions that go beyond the scope of this EB, please contact the After Sales Service at PFEIFFER Chemie-Armaturenbau GmbH.

⇨ This manual only applies to the sampling valve itself, the respective additional manual applies for the mounted actuator.

Definition of signal words

DANGER

Hazardous situations that lead to death or serious injuries

WARNING

Situations that can lead to death or serious injuries

NOTE

Property damage and malfunctions

Info

Additional information

Tip

Recommended action

Content

1 Safety instructions and safety measures

Intended use

The PFEIFFER BR 27c sampling valve is manually operated or in combination with a spring-closing actuator designed to sample liquids with a variable sample volume from a material flow.

- The sampling valve may only be operated under operating conditions after a sample bottle or stopper has been mounted properly underneath the valve. The fixtures approved for this can be requested from PFEIFFER.
- The sampling valve and its actuator are designed for precisely defined conditions (e.g. operating pressure, utilised medium, temperature).

  Therefore the operator must make sure that the sampling valve is only used when the conditions of use comply with the design criteria defined in the order.

  If the operator would like to use the sampling valve in other applications or environments, they must contact PFEIFFER.
- This continuous sampling valve is exclusively intended
  - the valve must be installed in a pipeline with flange connections,
  - for automation after connecting the actuator to a compressed air supply up to max. 10 bar,
  - a sample bottle must be attached underneath the sampling valve,
  - the permissible pressure and temperature ranges may not be exceeded.

  for taking samples of liquid media from the pipeline in variable quantities filled in a sufficiently sturdy sample bottle.

  The connection and holding fixture for the sample bottle must be specified beforehand by the customer.

  PFEIFFER has developed various fixtures for this purpose.
- The data sheet contains the permissible pressure and temperature range for these sampling valves ▶ TB 27a.
- The safety regulations that apply to the pipe system in which the valves are installed and to the control system to which the actuator is connected also apply to the sampling valves.

  This manual only provides safety instructions that are to be observed additionally for sampling valves.

  There may be additional safety instructions in the manuals for the actuator assemblies.
- It is assumed that this chapter is observed when using the valve as intended.

Reasonably foreseeable erroneous use and unintended use

The sampling valve is not suited for the following areas of use:

- Use outside of the technical data and the limits defined by the design.
- Use outside of the limited defined by the peripheral devices installed on the sampling valve.

Furthermore, the following activities are considered unintended use:

- Use of third-party spare parts.
- Performance of maintenance and repair work that is not described.

Qualification of operating personnel

The sampling valve may only be disassembled, dismantled, assembled and commissioned by qualified specialist personnel trained in pressurised pipes who are familiar with the assembly, commissioning and operation of this product.

- Skilled staff in the sense of these operating instructions is persons who, as a result of their training, their knowledge and their experience, as well as their knowledge of the relevant standards, are able to judge the tasks assigned to them and are able to recognize possible dangers.
- The operation of the valve, in particular, attaching the sample bottle to the valve, may only be performed by experienced and trained personnel who can recognize and react to any possible dangers that could be caused by leaking media. The supplementary instructions for the holding fixture for the sample bottle are observed.
- Prior to taking samples of dangerous media, personnel must wear protective clothing (e.g. gloves, goggles), to prevent personal injury that could be caused by any medium escaping during taking a sample.

Personal protective equipment

Depending on the utilized medium, PFEIFFER recommends the following protective equipment:

- Protective garments, protective gloves and eye protection when using hot, cold, aggressive and/or corrosive media.
- Hearing protection when working near the valves.
- Request additional protective equipment from the plant operator.

Prohibition of modifications

Changes to the product are not permitted without consulting PFEIFFER. Non-compliance invalidates the warranty and product guarantee. PFEIFFER shall not be held liable for any resulting property damage or personal injury.

Protective devices

- In the case of a power supply failure, the automated sampling valve automatically switches to a certain fail-safe position, see Fail-safe positions”in Chapter “3 Design and principle of operation”.
- It is strongly recommended that any type of actuation is “dead man´s control”.
- The fail-safe position corresponds to the effective direction and is indicated on the type plate of the actuators, see the actuator documentation.
- The valve is to be included in the equipotential bonding of the plant.

Warning of residual risks

To prevent personal injury or property damage, the operator and operating personnel must use suitable measures to prevent the hazards that can result from the flow medium and operating pressure as well as the signal pressure and moving parts of the sampling valve.

– Therefore, the operator and operating personnel must observe all the hazard information, warning information and information in this installation and operating manual.

Obligation of the operator to exercise diligence

The operator is responsible for proper operation as well as compliance with the safety regulations.

– The operator is responsible for providing operating personnel with this installation and operating manual as well as the applicable documents and to provide instructions on proper operation.
– Furthermore, the operator must ensure that operating personnel and third parties are not endangered.

It is not the responsibility of PFEIFFER and therefore when using the sampling valve ensure that:

– The sampling valve is only used as intended as described in this chapter.
– An actuator unit that is subsequently installed on the sampling valve is adapted to the sampling valve and the max. torque is observed, and is correctly adjusted in the end positions, and in particular in the closing position of the sampling valve.
– The pipe system and control system are properly installed and regularly checked. The wall thickness of the sampling valve body is measured such that an additional load of the usual magnitude is taken into account for a pipe system installed properly in this way.
– The valve is connected properly to these systems.
– The customary flow rates in continuous operation are not exceeded in this pipe system.
– PFEIFFER is contacted in the case of abnormal operating conditions, such as vibrations, hydraulic shock, cavitation and also small amounts of solid matter in the medium, especially abrasive matter.

Obligation of operating personnel to exercise diligence

Operating personnel must be familiar with this installation and operating manual and the applicable documents and comply with the indicated hazard information, warning information and other information. Furthermore, operating personnel must be familiar with the applicable regulations concerning occupational safety and accident prevention and observe them.

Applicable standards and directives

– The sampling valves fulfil the requirements of the European Pressure Equipment Directive 2014/68/EU and the European Machinery Directive 2006/42/EC.

  In the case of sampling valves provided with a CE marking, the Declaration of Conformity provides information about the conformity assessment procedure that was used.

  The corresponding declarations of conformity are available in the Annex of this EB, see chapter "14 Certificates".

– According to an ignition hazard assessment according to DIN EN ISO 80079-36, PFEIFFER valves do not have any own potential ignition sources and therefore are not subject to Directive 2014/34/EU.

  CE marking based on this standard is not permitted. The inclusion of valves in the equipotential bonding of a plant applies independently of the directive for all metal parts in potentially explosive areas.

1.1 Notes regarding possible severe personnel injury

⚠ DANGER

Hazards and ineffectiveness of the warranty!

In the case of non-compliance with the following hazard and warning information, hazards may arise and the warranty provided by PFEIFFER may become invalid.

⇨ *Observe the following hazards and warning information.*
⇨ *Contact PFEIFFER in the case of questions.*

Hazards and damage due to unsuitable sampling valves!

Sampling valves whose permissible pressure/temperature range (="rating") is not sufficient for the operating conditions can pose a danger to the user and cause damage to the pipe system.

⇨ *Only operate sampling valves whose permissible pressure/temperature range (="rating") is sufficient for the operating conditions. (see data sheet ▶ TB 27a)*

Risk of bursting of the pressure equipment!

Sampling valves and pipes are pressure equipment. Improper opening can cause the bursting of sampling valve components.

⇨ *Observe the maximum permissible pressure for the sampling valve and plant.*
⇨ *Before working on the sampling valve, depressurise the concerned plant parts and the sampling valve.*
⇨ *Before removing the sampling valve from the pipe, completely release the pressure in the pipe so that the medium does not escape uncontrolled from the line.*
⇨ *Bring the sampling valve into the open position so the pressure is released from the ball.*
⇨ *Empty the medium from the concerned plant parts and sampling valve. (Wear protective equipment)*

1.2 Notes regarding possible personnel injury

⚠ WARNING

Danger of burning due to hot or cold components and pipes!
Depending on the utilised medium, sampling valve components and pipes can become very hot or very cold and cause burns upon contact.

⇨ *The sampling valves must be protected against contact in the case of operating temperatures >+50 °C or <-20 °C together with the pipe connections.*

Danger of crushing due to moving parts!
The sampling valve contains moving parts (actuator stem, control shaft and hand lever) that can lead to crushing if reaching into it.

⇨ *Do not reach into the yoke during operation.*
⇨ *When working on the sampling valve, interrupt and lock pneumatic energy and the control signal.*
⇨ Bleed the actuator.

Danger of injury during the switching operation if performing test runs on sampling valves not installed in the pipe!

⇨ *Do not reach into the sampling valve. This can result in serious injuries.*

Danger of injury due to venting the actuator!
During operation, when regulating or opening and closing the sampling valve, the actuator can be ventilated.

⇨ *Install the sampling valve such that the actuator does not ventilate at eye level.*
⇨ *Use suitable silencers and plugs.*
⇨ *Wear eye protection and, if necessary, hearing protection when working near valves.*

Danger of injury due to preloaded springs!
Sampling valves that are equipped with preloaded actuator springs are under mechanical tension.

⇨ *Before working on the actuator, release the compression from the preloaded springs, see the corresponding actuator documentation.*

Danger of injury due to residual medium in the sampling valve!
When a sampling valve must be removed from a pipe, medium can escape from the pipe or the sampling valve.

⇨ *In the case of media that is harmful to health or hazardous, the pipe must be completely emptied before a sampling valve can be removed.*
⇨ *Pay attention to the afterflow of residuals or residuals that remain in dead spots.*

Danger of injury due to the releasing of body screw connections!
If the body screw connections must be released, medium can escape from the sampling valve.

⇨ *The screw connections on the connection of the body parts may only be released or loosened after the sampling valve has been removed.*
⇨ *During reassembly, tighten the screws according to Table 15-1 and Table 15-2 in chapter "15.1.1 Tightening torques" using a torque wrench.*

⚠ WARNING

Hazards due to incorrect sampling valve use!
The incorrect use of the sampling valve can represent a hazard for the user and cause damage to the pipe system that are then no longer the responsibility of PFEIFFER.

⇨ *The material selected for the parts of the sampling valve that come into contact with the media must be suitable for the utilised media, pressures and temperatures.*

Danger due to incorrect operation of the sampling valve!
If the sample container is missing, spurting medium can cause hazards.

⇨ *Sampling valves without an attached sample container must be appropriately secured against unauthorised operation or provided with a warning notice.*

Dangers of using the wrong sample containers!
Preventing using wrong sample bottles:
The adapter (or various adapters for exchanging) has been matched to the size and shape of the sample bottles to be used as specified by the customer.

⇨ *In the event that other sample bottles are to be used, the customer must consult PFEIFFER beforehand to confirm their use.*

Danger due to excess pressure in the sample containers!
The adapter includes a vent bore which prevents pressure from building up in the sample bottle which could destroy the bottle.

⇨ *The sampling valve is supplied with a sealing plug in the vent bore to protect against the ingress of foreign bodies. This must be removed before commissioning.*
⇨ *This vent bore and the connected drainage line may not be blocked and must be cleaned at regular intervals to prevent blockage.*

Danger due to incorrect sampling!
Due to the continuous sampling procedure, a possible rapid over filling of the sampling container may occur, leading to the sampling media being released into the environment.

⇨ *To avoid over filling the sample container, the sampling procedure must be observed at all times.*
⇨ *It is therefore strongly recommended activating the „dead mans control" by every sampling procedure, in this way the automation is finished automatically on completion of the sampling procedure.*

Dangers due to use as an end fitting!
During normal operation, in particular with gaseous, hot and/or hazardous media, spraying medium can cause hazards. It must be kept in mind that the media is usually hazardous!

⇨ *A blind flange must be assembled on the free connecting pieces or the sampling valve must be secured against unauthorised actuation.*
⇨ *If a sampling valve used as an end fitting in a pressurised line is opened, this may only be done with extreme caution so that the escaping medium does not cause any damage.*

1.3 Notes regarding possible property damage

NOTE

Damage to the sampling valve due to unsuitable medium properties!
The sampling valve is designed for a medium with certain properties. Other media can damage the sampling valve.
⇨ *Only use a medium that corresponds to the design criteria.*

Damage to the sampling valve due to contamination!
Contamination (e.g. solid particles) in the pipes can damage the sampling valve.
⇨ *The plant operator is responsible for cleaning the pipes in the plant.*
⇨ *Rinse the pipes prior to commissioning.*
⇨ *Observe the maximum permissible pressure for the sampling valve and plant.*

Damage to the sampling valve and leakage due to excessively high or low tightening torques!
The sampling valve components must be tightened with specific torques. Deviating torques can lead to sampling valve leakage or damage.
⇨ *Excessively tightened components are subject to increased wear.*
⇨ *Insufficiently tightened components can cause leakage.*
⇨ *Observe the tightening torques, see Table 15-1 and Table 15-2 in Chapter "15.1.1 Tightening torques"*

Damage to the sampling valve due to an impermissible pressure increase!
The sampling valve body may contain small amounts of medium in the closed and open position.
⇨ *Use a sampling valve with an optional relief bore if it is possible that the closed area of the ball filled with medium can heat up due to external heat. (This prevents an impermissible pressure increase due to a change in the condition of the unit.)*

Deviation of the breakaway and actuating forces due to non-actuation of the sampling valve!
Depending on the period of time of non-actuation, the breakaway and actuation forces can deviate considerably from the actuating power data in the data sheet.
It is recommended that sampling valve that remain permanently in one position are actuated 3 to 4 times a year.
⇨ *If the operator retrofits the actuator, PFEIFFER is no longer responsible for the correct actuator design with regard to the duration of non-actuation.*

Damage to the sampling valve due to plant vibrations!
⇨ *If necessary, secure hand-operated sampling valves in the case of plant vibrations with a locking device to prevent it from moving by itself.*

Damage to the sampling valve due to unsuitable tools!
Unsuitable tools can damage the sampling valve.
⇨ *Suitable tools are required to work on the sampling valve, see Chapter "15.1.3 Tools".*

NOTE

Damage to the sampling valve due to unsuitable lubricants!
Unsuitable lubricants can corrode and damage the surface.
⇨ *The sampling valve material requires suitable lubricants, see chapter "15.1.2 Lubricants".*

1.4 Warning notes on the device

Warning of moving parts

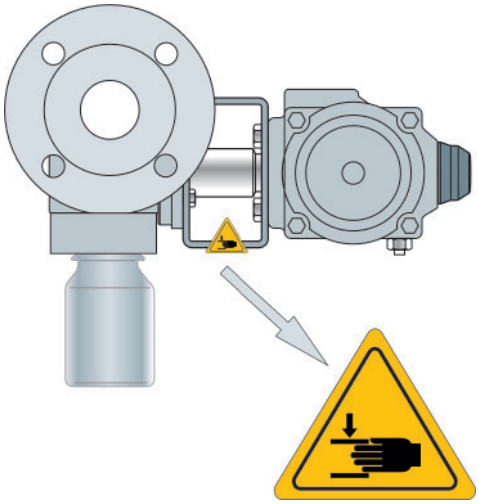


Fig. 1-1: *Warning of moving parts*

There is a danger of crushing due to the rotary movements of the actuator- and control shaft when reaching into the yoke as long as the pneumatic power is connected to the actuator. At the operator's request, a warning note can be attached to the valve.

2 Markings on the device

Each sampling valve usually has the following marking.

Table 2-1: *Marking on the type plate and on the body of the sampling valve*

Item	For	Marking	Remark
1	Manufacturer	PFEIFFER	Address see Chapter "15.4 Service"
2	Valve type	BR (and number value)	e.g. BR 27c = Series 27c, see the PFEIFFER catalogue
3	Body material	e.g. 1.4571	Material standard according to DIN EN 10272
4	Size	DN (and number value)	Number value in [mm], e.g. DN 50 / number value in [inch], e.g. NPS2
5	Maximum pressure	PN (and number value)	Number value in [bar], e.g. PN 40 / number value in [inch], e.g. cl150, at room temperature
6	Max. permissible operating temperature	TS (and number value)	PS are TS are related values here at the max. permissible operating temperature with the max. permissible operating overpressure, see pressure-temperature diagram in data sheet ▶ TB 27a.
	Max. permissible operating pressure	PS (and number value)	
7	Test pressure	PT (and number value)	The test pressure must be observed depending on the device
8	Manufacturer number from 2018	e.g. 341234/001/001	34 1234 /001 /001 Valve no. within the item Item in the order Order Year of manufacture (39=2019, 30=2020, 31=2021, 32=2022, 33=2023, 34=2024 etc.)
	Manufacturer number 2009 to 2017	e.g. 211234/001/001	21 1234 /001 /001 Valve no. within the item Item in the order Order Year of manufacture (29=2009, 20=2010, 21=2011, 22=2012 etc.)
	Manufacturer number until 2008	e.g. 2071234/001/001	207 1234 /001 /001 Valve no. within the item Item in the order Order Year of manufacture (205=2005, 206=2006, 207=2007 etc.)
9	Year of manufacture	e.g. 2024	upon customer request, the year of manufacture can also be indicated on the valve
10	Data/Matrix code		
11	Conformity	CE	Conformity is certified separately by PFEIFFER
	Code No.	0035	"Notified body" according to EU Directive = TÜV Rheinland Service GmbH
12	Flow direction	➔	Attention: see the note in Chapter "5.4 Installing the sampling valve in the pipe"

Info

Markings on the body and the type plate must be permanent so that the valve remains identifiable.

2.1 Type plate

2.1.1 Actuator type plate

See the corresponding actuator documentation.

2.2 Material identification

The sampling valves are marked on the body with the material specification; see “Table 2-1: Marking on the type plate and on the body of the sampling valve”.

Further details can be obtained from PFEIFFER.

3 Design and principle of operation

Features

The **continuous BR 27c** Sampling valve has the following characteristics:

- Sampling with a variable sample volume from a material flow.
- Sampling also possible under pressure to 16 bar.
- Actuation only with dead man's handle (not part of the valve).

Characteristics

The valve consist of a sampling valve and a spring-closing pneumatic quarter-turn actuator or a dead man's handle.

This modular design has the following characteristics:

- Body of stainless steel (1.4571)
- Sampling ball / shaft of stainless steel (1.4571)
- Representative sampling due to the direct installation in the pipeline
- No necking or abrasion of the pipeline during sampling
- Venting or control connection 1/8″
- Seat ring shells for a sampling without cavity
- The sampling valve has a connection as per ISO 4796, DIN thread GL 45
- Control shaft sealing by means of a disc spring pre-loaded PTFE V-ring packing
- Connection as per DIN ISO 5211
- Face to face as per DIN EN 558, row 1

Function and principle of operation

The sampling valve is installed in the product pipeline by means of flanges and permits bidirectional flow.

Due to the concave milling-out of the sampling ball (9), there is no necking in the area of the medium flow.

The sampling ball is surrounded on all sides by tight-closing seat rings (10). The sealing of the sampling ball is by means of an exchangeable PTFE seat rings. This can also be specially adapted to the medium.

The sampling ball (9) is bearing-mounted and rotatable around the control shaft (2).

The sealing of the control shaft (2) is ensured by means of a PTFE V-ring packing (6). The packing is maintenance-free pre-loaded via disc springs (7).

The control shaft that leads outside is fit with a dead man's handle as standard.

The connection according to DIN ISO 5211 permits the fitting of a spring-closing actuator.

The glass bottle (22) has a connection in accordance with ISO 4796 thread GL 45.

Customer specific adapters for other connections can also be offered.

Operating elements and functions

- With dead man's handle
- Automatic with spring-closing 90° Quarter-turn actuator (for details see respective data sheet)

Fail-safe position

If the air supply failure, the automated sampling valve automatically assumes the "spring-closing" safety position.

- **Sampling valve with fail-close actuator [FC]:**

  Upon air failure, the through-bore of the sampling ball is moved away from the media flow.

  The sampling valve is closed so that no medium escapes.

Changing the fail-safe position

The safety position should not be changed.

3.1 Additional fittings

Strainer

PFEIFFER recommends installing a strainer in front of the sampling valve.

A strainer prevents the solid content in the medium from damaging the sampling valve.

Bypass and shut-off valve

PFEIFFER recommends installing a shut-off valve in front of the strainer as well as behind the sampling valve and to create a bypass.

By means of the bypass, the entire plant does not have to be decommissioned during maintenance and repair work on the sampling valve.

Insulation

The sampling valves can be insulated to reduce the passage of heat energy.

Observe the notes in Chapter " 5 Assembly".

Test connection

It is possible to use a test connection (e.g. G⅛″) between the seat rings and the sampling container.

Grip protection

In the case of conditions of use that require a high level of safety (e.g. if the sampling valve is freely accessible to untrained specialist personnel), PFEIFFER offers a safety guard to prevent the risk of crushing due to moving parts (actuator- and control shaft).

The risk assessment of the plant by the operator will indicate if the installation of this protective device is required for the safe operation of the sampling valve in the plant.

3.2 Attachments

For the sampling valve, the following accessories are available individually or in combinations:

– Protective box in stainless steel
– Special gas chamber exhaust
– Pneumatic switch box for automation
– Pneumatic timer
– Counter
– Adapter for locally employed sample containers

Other add-on parts are available as per specification on request.

3.3 Technical data

The type plates of the sampling valve and actuator offer information about the valve version, see Chapter "2 Markings on the device".

Info

– Detailed information is available in the data sheet ▶ TB 27a.
– The documentation for the special sampling valves BR 27c that are not described in this chapter can be requested from PFEIFFER.

3.4 Sampling valve assembly

3.4.1 Preparation of the assembly

To assemble the sampling valve, all parts must be prepared, e. g. the parts are carefully cleaned and placed on a soft mat (rubber mat or other).

Keep in mind that plastic parts are almost always very soft and very delicate, and in particular the sealing surfaces may not be damaged.

NOTE

Damage due to cold welding of the screws in the body!

⇨ *PFEIFFER recommends a heavy-duty grease paste (e.g. Gleitmo 805, manufacturer Fuchs) to prevent the cold-welding of the screws in the bodies.*
⇨ *Do not use this product for sampling valves with use of oxygen.*
⇨ *A suitable lubricant must be selected for grease-free sampling valves, especially for use with oxygen.*

Info

The position and arrangement of the individual parts shown in Fig. 3-1 must be observed during assembly.

3.4.2 Assembly of the sampling valve

⇨ Clamp the main body (1) with the sealing area of the ball facing upwards in a vice, so that it is accessible for assembly.
⇨ The sealing disc (12) and the disc spring (11) are inserted into the body. Position of the disc spring, see Fig. 3-1.
⇨ The bearing bush (5) is pressed into its intended position, for the subsequent locating of the stem.
⇨ Insert the lower part of the seat ring (10a) into the body.
⇨ Insert the control shaft (2) through the mounted bearing bush (5) into the shaft bushing.
⇨ The sampling ball (9) with the slot is pressed onto the control shaft (2), and with firm evenly applied pressure, the control shaft is turned and pressed until it finally sits in the seat ring (10a).
⇨ Finally, the ball is turned 90°, so that the sampling bore is facing forward.
⇨ The seat ring, top-part (10b) is inserted, then the ball is rotated slowly, so that the sealing element locates cleanly into position.
⇨ Insert the O-ring (13) into the seat ring (10b).

3.4.3 Bonnet assembly for screw cap (standard)

⇨ Place the funnel (16) on the seat ring.
⇨ Grease the screws (15).
⇨ Place the bonnet with insert (14) on the body and adjust with the screws (15). Tighten the screws evenly and tighten alternately.

Info

The permissible torque for tightening the bonnet can be found in Table 15-2 in Chapter "15.1.1 Tightening torques.

⇨ Screw in the screw plug (17).
⇨ For further assembly, see chapter "3.5.5 Final assembly of the sampling valve".

3.4.4 Bonnet assembly for bayonet lock (option)

⇨ Grease the screws (19).
⇨ Place the bonnet with insert (18) on the body and adjust with the screws (19). Tighten the screws evenly and tighten alternately.

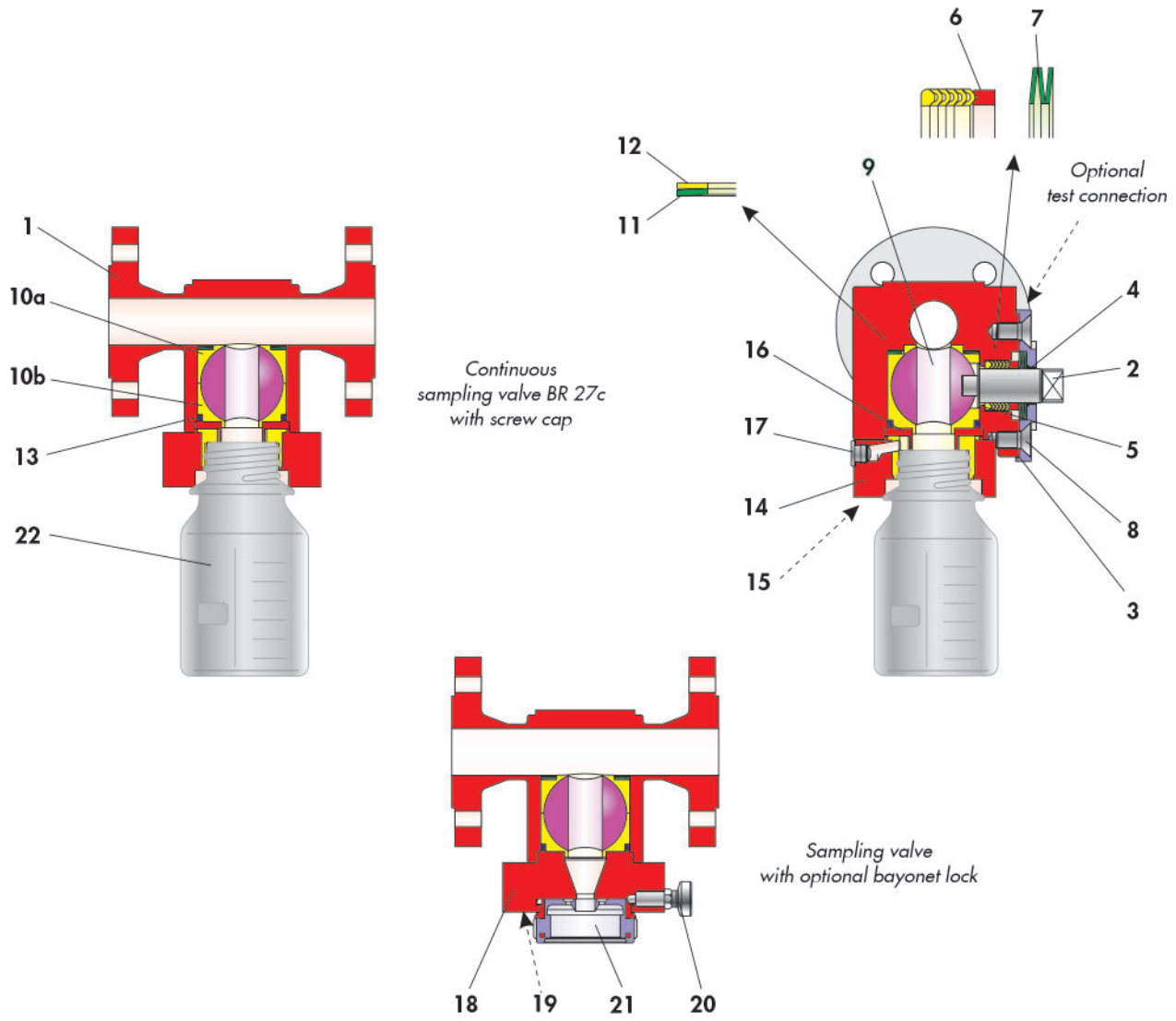


Fig. 3-1: *Sectional drawing of the BR 27c sampling valve*

Table 3-1: *Parts list*

Sampling valve	
Item	**Description**
1	Main body
2	Control shaft
3	Stuffing box flange
4	Bearing bush
5	Bearing bush
6	V-ring packing
7	Disc spring set
8	Screw

Sampling set	
Item	**Description**
9	Sampling ball
10	Seat ring
11	Disc spring
12	Sealing disc
13	O-ring

Sampling container	
Item	**Description**
22	Sampling bottle

Screw-on bonnet (standard)	
Item	**Description**
14	Bonnet
15	Screw
16	Funnel
17	Screw plug

Bonnet with bayonet lock (option)	
Item	**Description**
18	Bonnet
19	Screw
20	Locking pin
21	Adapter

Info

The permissible torque for tightening the stuffing box flange can be found in Table 15-2 in Chapter "15.1.1 Tightening torques.

⇨ Screw in the locking pin (20).

⇨ Insert the adapter (21) into the bonnet and turn until the locking pin engages.

Info

The adaptation of sampling containers is available in various designs, also according to customer requirements, on request.

⇨ For further assembly, see chapter "3.5.5 Final assembly of the sampling valve".

3.4.5 Final assembly of the sampling valve

⇨ Now turn the body 90° and once again clamp in the vice, so that the stuffing box area is facing upwards, and accessible for further assembly.

⇨ The PTFE V-ring packing (6) is inserted together in the body bore in the following order: PTFE bottom ring, PTFE V-rings, and steal V-ring.

⇨ Following this, insert the disc spring set (7). For exact positioning and locating of the V-ring packing and spring washers, refer to Fig. 3-1.

⇨ Press the bearing bush (4) into the stuffing box flange (3).

⇨ Grease the screws (8).

⇨ The stuffing box flange (3), together with the bearing bush (4), are mounted, and aligned with the screws (8). Next, tighten the screws evenly and in alternating pattern.

Info

The permissible torque for tightening the bonnet can be found in Table 15-1 in Chapter "15.1.1 Tightening torques.

4 Shipment and on-site transport

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task.

NOTE

Damage to the sampling valve due to improper transport and storage!

⇨ *Sampling valves must be handled, transported and stored with care.*

4.1 Accepting delivery

Perform the following steps after receiving the goods:

⇨ Check the scope of supply. Compare the delivered goods with the delivery note.

⇨ Check the supply for transport damage. Report transport damage to PFEIFFER and the transport company (see the delivery note).

4.2 Unpacking the sampling valve

Carry out the following steps:

⇨ Unpack the sampling valve directly before lifting for installation into the pipe.

⇨ Leave the sampling valve on the pallet or in the transport container for on-site transport.

⇨ The protective caps on the sampling valve inlet and outlet prevent foreign matter from entering the sampling valve and damaging it. Only remove the protective caps prior to installation in the pipe.

⇨ A screw plug (17) in the vent bore prevents foreign bodies from entering the sampling valve during transport.

⇨ Dispose of the packaging properly.

4.3 Transporting and lifting the sampling valve

DANGER

Danger due to falling of suspended loads!

Do not stand under suspended loads.

WARNING

Danger of injury due to the tipping of the sampling valve!

⇨ *Observe the centre of gravity of the sampling valve.*

⇨ *Secure the sampling valve against tipping and twisting.*

WARNING

Overturning of the lifting equipment and damage to the load lifting equipment by exceeding the lifting capacity!

⇨ *Only used approved lifting equipment and load lifting equipment whose lifting capacity corresponds at least to the weight of the sampling valve including the actuator.*

⇨ *Take the weights from the respective data sheet.*

NOTE

Damage to the sampling valve due to improper fastening of the sling!

The screwed-in lifting eyes on actuators are used only for actuator assembling and disassembling as well as for lifting the actuator without the sampling valve. These lifting eyes are not intended for lifting the complete sampling valve.

⇨ *When lifting the sampling valve, make sure that the entire load is carried by the sling that is fastened to the sampling valve body.*

⇨ *Do not fasten the load-bearing sling to the actuator, hand wheel or other components.*

⇨ *Do not use the control air lines, accessories or other components with safety functions for suspension or damage them.*

4.3.1 Transporting

The sampling valve can be transported using lifting equipment such as a crane or a forklift.

⇨ Leave the sampling valve on the pallet or in the transport container for transport.

⇨ Sampling valves that weigh more than approx. 10 kg should be transported on a pallet (or supported similarly) (also to the installation site). The packaging should protect the valve from damage.

⇨ Comply with the transport conditions.

Transport conditions

⇨ Protect the sampling valve against external influences, such as impacts.

⇨ Do not damage the corrosion protection (paint, surface coating). Repair damage immediately.

⇨ Protect the sampling valve against moisture and dirt.

4.3.2 Lifting

When installing the sampling valve in the pipe, larger sampling valves can be lifted using lifting equipment such as a crane or forklift.

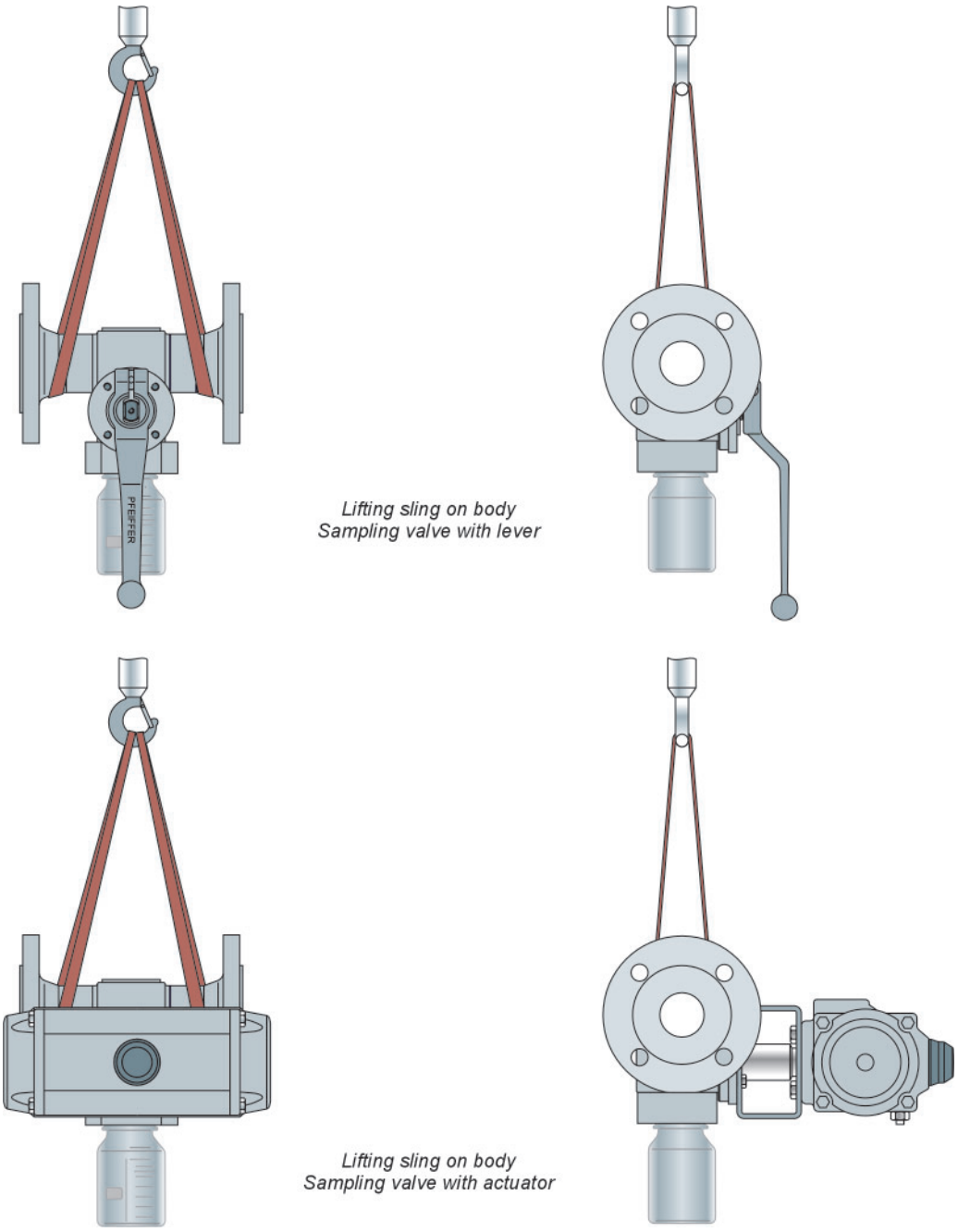


Fig. 4-1: *Lifting points on the sampling valve*

Conditions for lifting

- ⇨ Use a hook with a safety clamp as the suspension element so that the sling cannot slip off the hook during lifting and transport, see Fig. 4-1.
- ⇨ Secure the sling against shifting and slipping off.
- ⇨ Fasten the sling such that it can be removed again after installation in the pipe.
- ⇨ Avoid swinging and tipping the sampling valve.
- ⇨ In the case of interruptions in work, do not leave the lifting equipment suspended in the air for a long period of time.
- ⇨ Lift the sampling valve aligned in the same direction in which it will be installed in the pipe.
- ⇨ Always lift the sampling valve in the centre of gravity of the load to prevent uncontrolled tipping.
- ⇨ Make sure that any slings between the lifting eyes on the rotary actuator and suspension element are not loaded. These slings are used only to secure the load against turning over while lifting. Before lifting the sampling valve, pretension this sling so it is taut.

WARNING

Danger due to incorrect lifting and transport!
The lifting points for the lifting slings shown in the schematic drawing serve as examples for most valve variants. On site the conditions for lifting and transporting the valve can change however.

⇨ *The operator makes sure that the valve is lifted and transported safely.*

4.3.3 Lifting points on the body

⇨ Fasten a lifting sling to each flange of the housing and on the suspension element (e.g. hook) of the crane or forklift, see Fig. 4-1. When doing so, ensure the safety, bearing capacity and length of the lifting slings

⇨ In the case of an actuator with a lifting eye: fasten additional lifting slings to the lifting eye on the actuator and on the suspension element.

⇨ Lift the sampling valve carefully. Check if the load lifting equipment holds.

⇨ Move the sampling valve at a constant speed to the installation site.

⇨ Install the sampling valve in the pipe, see chapter 5.4.

⇨ After installation in the pipe: check that the flanges are firmly tightened and that the sampling valve holds in the pipe.

⇨ Remove the lifting slings.

4.4 Storing the sampling valve

NOTE

Damage to the sampling valve due to improper storage!

⇨ *Comply with the storage conditions*

⇨ *Avoid long storage periods*

⇨ *In the case of deviating storage conditions and a longer storage period, contact PFEIFFER*

Info

PFEIFFER recommends checking the sampling valve and the storage conditions regularly during a longer storage period.

⇨ In the case of storage prior to installation, the sampling valve should normally be stored in a closed room where it is protected against harmful influences such as impacts, dirt or moisture. A room temperature of 25 °C ±15 °C is recommended.

⇨ In particular, the actuator and the ends of the sampling valve to the pipe connection may not be damaged by mechanical or any other influences.

⇨ Do not stack the sampling valves.

⇨ Prevent condensation in damp rooms. Use a desiccant or heater.

⇨ The sampling valve must be stored in its protective packaging and/or with the protective caps on the connection ends.

⇨ Sampling valves that weigh more than approx. 10 kg should be stored on a pallet (or supported similarly).

⇨ Sampling valves are usually delivered in a completely open position. They must be stored in the position in which they were delivered. The actuating device must not be actuated.

⇨ Do not place any objects on the sampling valve.

5 Installation

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task.

The following instructions apply additionally for sampling valves. Observe chapter "4.3 Transporting and lifting the sampling valve" for transport to the installation site.

5.1 Installation conditions

Operator level

The operator level for the sampling valve is the front view on all operating elements of the sampling valve including devices and attachments from the perspective of operating personnel.

The plant operator must make sure that the operating personnel can carry out all necessary work and sampling safely and easily accessible from the operator level after installing the device.

Pipe routing

The guidelines applicable on site apply for the installation of sampling valves in the pipe.

Install the sampling valve such that there is low vibration and no mechanical stress. Observe the sections "Installation position" and "Support and mounting" in this chapter.

Install the sampling valve so there is enough space to replace the actuator and sampling valve as well as to perform maintenance work.

Installation position

Sampling valves may only be installed in pipelines in such a way that the sample bottle is vertically suspended.

Make sure sufficient space is left underneath the valve for connecting and handling the sample bottles. Refer to Data Sheet ▶ TB 27a for these dimensions.

Support and mounting

Provide appropriate support for the following versions:

– Nominal sizes from DN 100 / NPS4
– Sampling valves with a stem extension or insulating part.

The plant manufacturer is responsible for the selection and implementation of a suitable support or mounting for the installed sampling valve as well as the pipe.

Venting

Vents are screwed into the exhaust air connections of pneumatic and electropneumatic devices to ensure that the generated exhaust air can be released to the outside (protection against overpressure in the device). Furthermore, vents allow the intake of air (protection against underpressure in the device).

⇨ Carry out venting on the side that faces away from the operator level.

⇨ When connecting the attachments, make sure that they can be accessed from the operator level safely and easily.

The bonnet of the sampling valve has a vent bore. This prevents pressure from building up in the sample container and container from being destroyed.

The vent bore and any connected drain pipe must not be blocked.

⇨ The sampling valve is supplied with a screw plug (17) in the vent bore to prevent foreign bodies from entering, see Fig. 5-1 and 5-2. Remove this before commissioning.

⇨ Clean the vent bore and drain pipe at regular intervals.

5.2 Preparing for assembly

Sampling valves must be handled, transported and stored with care, see chapter "4 Delivery and on-site transport".

Perform the following steps after receiving the goods:

⇨ Check the scope of supply. Compare the delivered goods with the delivery note.

⇨ Check the supply for transport damage. Report transport damage to PFEIFFER and the transport company (see the delivery note).

Ensure the following conditions prior to assembly:

– The sampling valve is clean.
– The sampling valve data on the type plate (type, nominal size, material, nominal pressure and temperature range) matches the plant conditions (nominal size and nominal pressure of the pipe, medium temperature, etc.). For details about the marking, see chapter "2 Markings on the device".
– Desired or required additional fittings, see chapter "3.2 Additional fittings", are installed or prepared as far as necessary before the assembly of the sampling valve.

5.3 Assembling the sampling valve and actuator

PFEIFFER sampling valves are supplied in working order. In individual cases, the actuator and sampling valve are delivered separately and must be assembled. The tasks are listed below that are necessary for assembly and prior to the commissioning of the sampling valve.

⚠ WARNING

Danger and damage due to retrofitting an actuator unit!
The subsequent fitting of an actuator unit can pose a danger to the user and cause damage to the pipe system.

⇨ *The actuator unit is spring-closing and correctly adjusted in the end positions of the sampling valve.*

⇨ *The torque, rotation direction, actuation angle and adjustment of the "OPEN" and "CLOSED" end stops must be adapted to the sampling valve.*

WARNING

Danger and damage due to high external loads on an actuator unit!

Actuators are not "stepladders".

⇨ *Loads may not be applied to the actuators as they can damage or destroy the sampling valve.*

Danger and damage due to heavy actuator units!

Actuators that are heavier than the weight of the ball valve can pose a danger to the user and cause damage to the pipe system.

⇨ *These actuators must be supported if they generate a bending stress on the sampling valve due to their size and/or installation situation.*

NOTE

Damage to the sampling valve due to the incorrect setting of the end stops!

The actuating device is adjusted to the operating data specified in the order.

⇨ *The adjustment of the "OPEN" and "CLOSED" end stops is the responsibility of the user.*

5.4 Installing the sampling valve in the pipe

5.4.1 General

⇨ Transport the sampling valve in its original packaging to the installation site and unpack it only there.

⇨ Inspect the ball valve and actuator for transport damage. Damaged sampling valves or actuators may not be installed.

⇨ A functional test is to be carried out at the beginning of installation for manually-operated sampling valves: the sampling valve must close and open correctly. Detected malfunctions must be fixed before commissioning, see chapter 8.

⇨ Handle the sampling valve with care and observe the instructions for the flange connection.

⇨ Make sure that only sampling valves are installed whose pressure classes, connection type (flow rate), type of lining and connection dimensions match the conditions of use. See the corresponding marking on the sampling valve.

DANGER

Danger due to exceeding the limits of use!

Exceeding the limits of use can pose a danger to the user and cause damage to the pipe system.

⇨ *No sampling valve may be installed whose permissible pressure/temperature range is not sufficient for the operating conditions.*

⇨ *The max. permissible limits of use are marked on the sampling valve, see chapter "2 Markings on the device".*

⇨ *The permissible range is defined in chapter "1 Safety instructions and safety measures".*

⇨ The counterflanges must have smooth sealing surfaces. Other shapes must be agreed upon with PFEIFFER.

⇨ The connection ends of the pipe must align with the sampling valve connections and have plane-parallel ends.

⇨ The connection data for the actuator unit must match the control data. See the type plate(s) on the actuator unit.

⇨ Prior to installation, the sampling valve and the connected pipe must be carefully cleaned of any contamination, in particular solid foreign matter.

⇨ The sealing surfaces on the flange connection and the utilized flange seals must in particular be free of all contamination during installation.

⇨ Optionally, an arrow is marked on the body. The direction of the arrow must correspond to the direction of flow in the pipe.

⇨ When pushing the sampling valve and the required flange seals into an already assembled pipe, the distance between the pipe ends must be measured such that all contact surfaces of the sampling valve and seals remain undamaged.

NOTE

Damage to the sealing surfaces and seals or untight flange connection due to improper assembly!

⇨ *Tighten the flange connections evenly and in a criss-cross pattern with the torques indicated in Table 15-3 in chapter "15.1.1 Tightening torques".*

⇨ *After longer storage of the sampling valve, retighten the body screws after installation with the corresponding tightening torques according to Table 15-1 or Table 15-2 in chapter "15.1.1 Tightening torques".*

⇨ The sampling valve is supplied with a screw plug (17) in the vent bore to prevent foreign bodies from entering, see Fig. 5-1 and 5-2. Remove this before commissioning.

⇨ Vents are screwed into the exhaust air connections of pneumatic and electropneumatic devices to ensure that the generated exhaust air can be released to the outside (protection against overpressure in the device).

Furthermore, vents allow the intake of air (protection against underpressure in the device).

⇨ Carry out venting on the side that faces away from the working area of operating personnel.

⇨ When installing peripheral devices, make sure that they can be operated from the working area of operating personnel.

⇨ Check the vent bore (and vent pipe) to ensure that they are not blocked.

5.4.2 Installing the sampling valve

⇨ Close the sampling valve in the pipe for the duration of the installation.

⇨ Lift the sampling valve with suitable lifting equipment at the installation site, see chapter "4.3 Transporting and lifting the sampling valve".
⇨ Observe the flow direction of the sampling valve. An optional arrow on the sampling valve indicates the flow direction, otherwise it can be used bidirectionally.
⇨ Remove the protective caps on the sampling valve openings prior to installation.
⇨ Clean the sealing surfaces on the sampling valve and pipe if necessary.
⇨ Use correct flange seals.
⇨ Screw the pipe together with the sampling valve without tension.
⇨ After installing the sampling valve, open it slowly in the pipe.

NOTE

Damage to the sampling valve due to a sudden pressure increase and resulting high flow speed!
Open the sampling valve slowly in the pipe during commissioning.

Info

Observe the following for sampling valves with a metal seat:
To avoid damaging the seat seal, make sure that the pipe connected upstream and downstream of the sampling valve is cleaned carefully of all rigid and abrasive particles prior to installation.

⇨ The associated instructions apply for connecting the actuator unit to the control equipment.
⇨ Check the correct function of the sampling valve.

5.4.3 Attachment of an additionally supplied holding fixture for sampling containers

The design and size of the holding fixture has been adapted to the sampling bottles used as specified by the customer.

⇨ If another holding fixture is intended to be used, PFEIFFER must first check it and approve its use.

WARNING

Risk of injury due to the use of an incorrect holding fixture!
The use of an incorrect holding fixture can be dangerous for the user and cause damage to the pipework system.

⇨ *If a holding fixture is to be retrofitted, it must be adapted to the sampling valve and sampling bottle.*

5.5 Checking the assembled sampling valve

5.5.1 Functional test

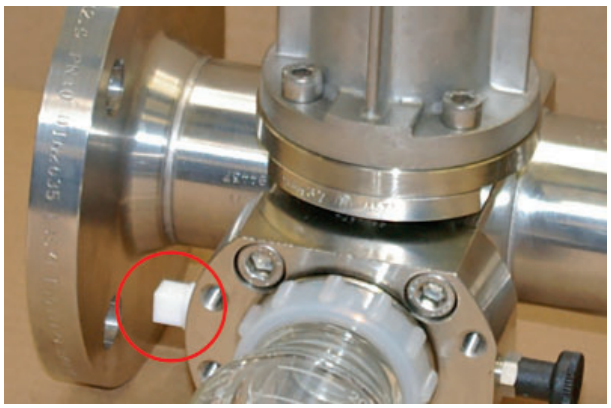


Fig. 5-1: *Position of the screw plug (17)*

Fig. 5-2: *Screw plug (17)*

WARNING

Danger of injury due to pressurised components and escaping medium!

⇨ The sampling valve is supplied with a screw plug (17) in the vent bore to prevent foreign bodies from entering, see Fig. 5-1 and 5-2. Remove this before commissioning.
⇨ *Do not loosen the screw of an optional test connection while the sampling valve is pressurised.*

Danger of crushing due to moving actuator- and control shaft!

⇨ *Do not reach into the yoke as long as the pneumatic power is connected to the actuator.*
⇨ *Before working on the sampling valve, interrupt and lock pneumatic energy and the control signal.*
⇨ *Vent the actuator.*
⇨ *Do not allow the jamming of objects in the yoke to hinder the operation of the actuator- and control shaft.*
⇨ *If the actuator- and control shaft are blocked (e.g. due to "seizure" if not actuated for a long period of time"), release the residual energy of the actuator (spring tension) before releasing the blockage, see the corresponding actuator documentation.*

⚠ WARNING

Danger of injury due to escaping exhaust air!
During operation, when regulating or when opening and closing the sampling valve, exhaust air can escape, for example from the actuator.

⇨ *Wear eye protection and, if necessary, hearing protection when working near valves.*

⇨ At the end of installation, perform a functional test with the control signals:

The sampling valve must close and open correctly according to the control commands. Detected malfunctions must be fixed before commissioning, see chapter "8 Malfunction".

⚠ WARNING

Danger due to improperly executed control commands!
Incorrectly executed control commands can cause serious injuries or even death and damage to the pipe system.

⇨ *Check the actuator unit and control command., see chapter "8 Malfunction".*

5.5.2 Pressure test of the pipe section

The pressure test was already performed on the sampling valves by PFEIFFER. Observe the following for the pressure test of a pipe section with installed sampling valves:

⇨ First carefully rinse newly installed pipe systems in order to wash out all foreign matter.

⇨ Ensure the following conditions for the pressure test:

- Sampling valve open: the test pressure may not exceed the value 1.5 x PN (according to the type plate).
- Sampling valve closed: the test pressure may not exceed the value 1.1 x PN (according to the type plate).

If a sampling valve leaks, observe chapter "8 Malfunction".

ℹ *Info*

The plant operator is responsible for performing the pressure test. After Sales Service at PFEIFFER can provide you with support for the planning and implementation of a pressure test specific to your plant.

5.5.3 Rotary movement

The rotary movement of the actuator- and control shaft must be linear without any jerky movements.

⇨ Open and close the sampling valve. When doing so, observe the movement of the actuator shaft.

⇨ Set the maximum and minimum control signal in succession to check the end positions of the sampling valve.

⇨ Check the display on the position indicator.

5.5.4 Fail-safe position

⇨ Close the signal pressure line.

⇨ Check whether the sampling valve moves to the fail-safe position, see "Fail-safe positions in chapter "3 Design and principle of operation".

6 Start-up

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task.

⚠ WARNING

Danger of burning due to hot or cold components and pipe!
Sampling valve components and pipes can become very hot or very cold during operation and cause burns upon contact.
⇨ *Let the components and pipes cool down or warm up.*
⇨ *Wear protective garments and protective gloves.*

Danger of injury due to pressurised components and escaping medium!
⇨ *Do not loosen the screw of the optional test connection while the sampling valve is pressurised.*

Danger of crushing due to moving actuator- and control shaft!
⇨ *Do not reach into the yoke as long as the pneumatic power is connected to the actuator.*
⇨ *Before working on the sampling valve, interrupt and lock pneumatic energy and the control signal.*
⇨ *Vent the actuator.*
⇨ *Do not allow the jamming of objects in the yoke to hinder the operation of the actuator- and control shaft.*
⇨ *If the actuator- and control shaft are blocked (e.g. due to "seizure" if not actuated for a long period of time"), release the residual energy of the actuator (spring tension) before releasing the blockage, see the corresponding actuator documentation.*
⇨ *Before disassembly the actuator, move the sampling valve to the safety position.*

Danger of injury due to escaping exhaust air!
During operation, when regulating or when opening and closing the sampling valve, exhaust air can escape, for example from the actuator.
⇨ *Wear eye protection and, if necessary, hearing protection when working near valves.*

Ensure the following conditions prior to commissioning/recommissioning:

– The sampling valve is installed properly in the pipe, see chapter "5 Assembly".
– The leak and function tests have been completed successfully, see chapter "5.1 Installation conditions".
– The current conditions in the concerned plant section correspond to the design of the sampling valve, see Intended use in chapter "1 Safety instructions and safety measures".

Commissioning/recommissioning

– Open the sampling valves slowly in the pipe. Opening slowly prevents a sudden increase in pressure and a resulting high flow speed that damages the sampling valve.
– Check the correct function of the sampling valve.

7 Operation

7.1 General

As soon as the commissioning/recommissioning work is complete, see chapter "6 Commissioning", the sampling valve is ready for operation.

⚠ WARNING

Danger of burning due to hot or cold components and pipe!
Sampling valve components and pipes can become very hot or very cold during operation and cause burns upon contact.
⇨ *Let the components and pipes cool down or warm up.*
⇨ *Wear protective garments and protective gloves.*

Danger of injury due to pressurised components and escaping medium!
⇨ *Do not loosen the screw of the optional test connection while the sampling valve is pressurised.*

Danger of crushing due to moving actuator- and control shafts!
⇨ *Do not reach into the yoke as long as the pneumatic power is connected to the actuator.*
⇨ *Before working on the sampling valve, interrupt and lock pneumatic energy and the control signal.*
⇨ *Vent the actuator.*
⇨ *Do not allow the jamming of objects in the yoke to hinder the operation of the actuator- and control shaft.*
⇨ *If the actuator- and control shaft are blocked (e.g. due to "seizure" if not actuated for a long period of time"), release the residual energy of the actuator (spring tension) before releasing the blockage, see the corresponding actuator documentation.*
⇨ *Before disassembly the actuator, move the sampling valve to the safety position.*

Danger of injury due to escaping exhaust air!
During operation, when regulating or when opening and closing the sampling valve, exhaust air can escape, for example from the actuator.
⇨ *Wear eye protection and, if necessary, hearing protection when working near valves.*

Observe the following points during operation:

– If required, after commissioning and reaching the operating temperature, tighten all flange connections between the pipe and sampling valve with the corresponding tightening torques, see Table 15-3 in chapter "15.1.1 Tightening torque".
– It can also be necessary to retighten the screw connections on the body sections with the corresponding tightening torques according to Table 15-1 and Table 15-2 in chapter "15.1.1 Tightening torque".
– The sampling valve/actuator unit must be actuated with the control signals.
– Sampling valves that were delivered from the factory with an actuator are precisely adjusted. The user is responsible for any changes they make.
– For the manual operation or manual override of the actuator (if present), normal manual forces are sufficient and the use of extensions to increase the actuation torque is not permitted.
– Turning the hand lever clockwise closes the sampling valve.
– In the case of sampling valves with a hand lever, the position of the hand lever indicates the location of the bore in the ball. The hand lever moves in general parallel to the bore. Special versions are to be taken from the respective order.

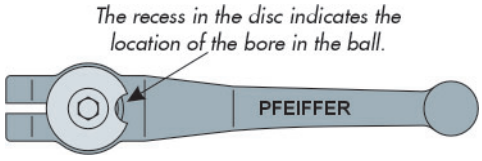


Fig. 7-1: *Hand lever*

⚠ DANGER

Danger of injury due to jerky operation of the sampling valve!
The failure to observe these warnings can cause extreme danger for persons or for the pipe system.
⇨ *Do not open and close the sampling valve suddenly to prevent pressure surges and/or a temperature shock in the pipe system.*

– If a sampling valve leaks, observe chapter "8 Malfunction".

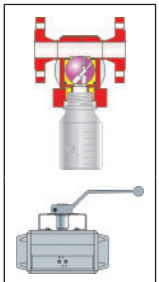
7.2 Operating the sampling valve

NOTE
⇨ *It may be necessary to clean the sampling chamber, and blind hole after a sample has been taken The operator must decide when this is necessary.*
⇨ *It is absolutely important, that when taking a sample, the sampling container (glass bottle etc.) is adapted to the temperature of the medium being taken*
⇨ *Safety precautions must be taken when the medium temperature exceeds 60 °C as a risk of scalding is possible.*
⇨ *When taking samples, the general accident prevention regulations must be complied with at all times!*

Info

For the following operating instructions, the sample bottle was selected as an example for the sample container.

7.2.1 Sampling valve with lever



⇨ Screw on the sample bottle by hand as tightly as possible.

⇨ Turn lever 90° until the bore is in the medium flow.

⇨ Hold the lever in this position until the required amount of medium has been collected.

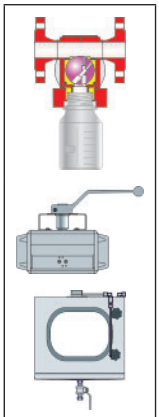
⇨ Turn back the lever.

Info

Do not release the lever abruptly while the medium is being collected, as the automatic device will be activated and the sampling will automatically stop

⇨ Unscrew the sample bottle, and if necessary, seal bottle with a lid.

7.2.2 Sampling valve with lever and protective case



⇨ Open protective case.

⇨ Screw on the sample bottle by hand as tightly as possible.

⇨ Close protective case.

⇨ Turn Lever 90° until the bore is in the medium flow.

⇨ Hold the lever in this position until the required amount of medium has been collected.

⇨ Turn back the lever.

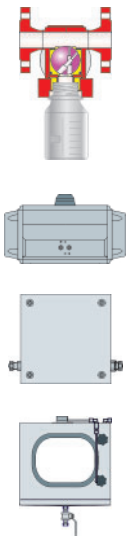
Info

Do not release the lever abruptly while the medium is being collected, as the automatic device will be activated and the sampling will automatically stop

⇨ Open protective case and remove the sampling bottle, and if necessary seal bottle with a lid.

⇨ Close the protective case.

7.2.3 Sampling valve with automated 90° rotary actuator and protective case



7.2.3.1 General automated sampling

⇨ Open protective case.

⇨ Screw on sample bottle by hand as tightly as possible.

⇨ Close protective case.

⇨ Open the air supply valve at the automation unit.

Info

Before operating, refer to the respective operating instructions for the automated unit, which can be found in chapter 7.3

⇨ Close the air supply valve at the automation unit.

⇨ Open the protective case, remove the sample bottle, and if necessary seal bottle with a lid.

⇨ Close protective case.

7.2.3.2 Automated sampling with back pressure indication

⇨ Operating this type of sampling is identical to the instructions in Chapter 7.2.3.1

⇨ In addition to the above mentioned version, the following function is included:

– The automation switches off automatically and no further sample can be taken when the sample level in the glass bottle reaches the back pressure tube.

⇨ When attaching the bottle, avoid at all times bending the back pressure tube!

7.2.3.3 Automated sampling with pneumatic barrier

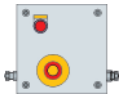
⇨ Operating this type of sampling is identical to the instructions in Chapter 7.2.3.1

⇨ In addition to the above mentioned version, the following function is included:

– The automation switches off automatically and no further sample can be taken when the protective case is opened during the sampling procedure.

7.3 Operation of automation units

7.3.1 Automation with „ON / OFF“ - Switch



NOTE

The pulse timing of actuation as well as the timing for filling the actuator with air or venting it are pre-set timings, which were set before leaving our works.

⇨ *Any alterations to these settings may only be made after first consulting PFEIFFER.*

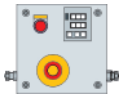
⇨ Press the start button.

⇨ Continue to press button until the required amount of medium has been collected in the bottle.

Info

If the button is released during or at the end of sampling, the „dead man´s control“ becomes active, and the sampling is switched off automatically.

7.3.2 Automation with counter



Note

The pulse timing and intervals between actuation cycles and the timing for filling the actuator with air or venting it, are pre-set timings, which were set before leaving our works.

⇨ *Any alterations to these settings may only be made after first consulting PFEIFFER.*

⇨ Set the number of actuating cycles at the counter.

Tip

The selected number of actuating cycles must correspond to the volume of the sample bottle.

⇨ Press the start button.

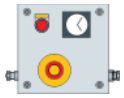
The pre-selected number of actuating cycles to take samples are performed.

⇨ The sampling finishes automatically after the selected number of actuating, cycles have been completed.

NOTE

In the event of an operation fault, press the emergency button immediately.

7.3.3 Automation with counter and timer switch



NOTE

The pulse timing of actuation and the timing for filling the actuator with air or venting it are pre-set timings, which are set before leaving our works.

⇨ *Any alterations to these settings may only be made after first consulting PFEIFFER.*

⇨ The required interval between each actuation cycle can be set at the timer switch, see Fig. 7-2.

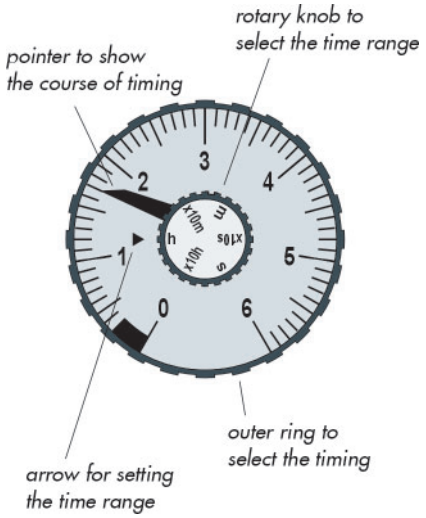


Fig. 7-2: *Samsomatic - Time switch 3970*

⇨ Select time range

The switch-over range is selected with the rotary knob located in the middle of the timer. By setting the dial arrow to the required range.

Selection	Time range
s	0,3 bis 6 seconds
x10s	3 bis 60 seconds
m	0,3 bis 6 minutes
x10m	3 bis 60 minutes
h	0,3 bis 6 hours
x10h	3 bis 60 hours

⇨ Determine which timing you require

The required cycle time can be set by turning the outer ring. A pointer indicates the cycle time.

⇨ Set the number of actuation cycles at the counter.

Info

The selected number of actuating cycles must correspond to the volume of the sample bottle.

⇨ Press the start button.

The pre-selected number of actuating cycles to take samples, together with the pre-selected intervals are performed.

⇨ The sampling finishes automatically after the selected number of actuating cycles have been completed.

NOTE

⇨ *In the event of an operation fault, press the emergency button immediately*

8 Malfunction

When rectifying the malfunction, chapter "1 Safety instructions and safety measures" must be observed.

8.1 Detecting and rectifying errors

Type of fault	Possible cause	Measures
Leaks in the pipe connection	The flange connection of the sampling valve is leaky	Tighten the flange screws. **NOTE** ***An excessive tightening torque when retightening the flange screws can damage the sampling valve and pipe!*** *The permissible torque for retightening the pipe flange screws is limited.* Retighten the flange connection with the respective tightening torque, see Table 15-3 in chapter "15.1.1 Tightening torques". If necessary, increase the tightening torque to max. 20%.
	The flange connection is still leaky after retightening	Loosen the flange connection and remove the sampling valve, see chapter "1 Safety instructions and safety measures". Check the plane parallelism of the flange connection and correct if it is not sufficient. Check the flange seals, if the seals are damaged, replace them.
Leaks in the body sections	Stuffing box flange and bonnet connection loosened	Retighten the connection of the stuffing box flange and bonnet with the respective tightening torque, see Table 15-1 and Table 15-2 in chapter "15.1.1 Tightening torques".
	Stuffing box flange and bonnet untight after retightening	Replace the body sealing and/or sampling valve, see chapter "1 Safety instructions and safety measures".
Increased medium flow rate with the sampling valve closed	Leakage in the closed position	Remove and inspect the sampling valve, see chapter "1 Safety instructions and safety measures".
	The sampling valve is damaged	Repairs are necessary Remove the sampling valve, see chapter "1 Safety instructions and safety measures". Request spare parts from PFEIFFER, see chapter "15.2 Spare parts". For the required repair instructions, see chapter "12 Repairs"
Leaks in the control shaft sealing	Medium escapes from the stuffing box	Remove the sampling valve, see chapter "1 Safety instructions and safety measures". Disassemble the sampling valve and replace the control shaft sealing. Request spare parts from PFEIFFER, see chapter "15.2 Spare parts". For the required repair instructions, see chapter "12 Repairs"
Malfunction	The actuator unit or control does not react	Check the actuator unit and control command.
	The actuator and control are OK	Remove and inspect the sampling valve, see chapter "1 Safety instructions and safety measures". Remove the actuator and measure and check the torque of the sampling valve.
	The sampling valve is damaged	Repairs are necessary. Remove the sampling valve, see chapter "1 Safety instructions and safety measures". Request spare parts from PFEIFFER, see chapter "15.2 Spare parts". For the required repair instructions, see chapter "12 Repairs"

Type of fault	Possible cause	Measures
Problems in the actuator unit	The pneumatic actuator must be removed	Disconnect the connection to the control pressure. Remove the actuator from the sampling valve (observe the “Safety instructions and safety measures”, see the included actuator unit manuals).

Info

– In the case of malfunctions that are not listed in the table, contact the After Sales Service at PFEIFFER.
– Spare parts must be ordered indicating all the data according to the sampling valve marking. Only original parts from PFEIFFER Chemie-Armaturenbau GmbH may be installed.
– If it is determined after removal that the sampling valve material lining is not sufficiently resistant for the medium, parts must be selected made of a suitable material.

8.2 Carrying out emergency measures

In the case of a power supply failure, the sampling valve automatically switches to the preset fail-safe position, see “Fail-safe positions” in chapter “3 Design and principle of operation”.

The system operator is responsible for emergency measures.

In case of a sampling valve fault:

– Close the shut-off valves upstream and downstream of the sampling valve so that no medium flows through the sampling valve.
– Troubleshoot the error, see chapter “8.1 Detecting and rectifying errors”.
– Rectify the fault that can be fixed as indicated in the instructions provided in this installation and operating manual. For malfunctions that cannot be fixed, contact the After Sales Service at PFEIFFER.

Recommissioning after malfunctions

See chapter “6 Commissioning”.

9 Servicing

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task.

The following documents are required in addition for the maintenance of the sampling valve:

– Installation and operating manual for the installed actuator, e.g ▶ EB 31a for BR 31a rotary actuators or the corresponding actuator documentation of other manufacturers.

⚠ WARNING

Danger of burning due to hot or cold components and pipe!
Sampling valve components and pipes can become very hot or very cold during operation and cause burns upon contact.
⇨ *Let the components and pipes cool down or warm up.*
⇨ *Wear protective garments and protective gloves.*

Danger of injury due to pressurised components and escaping medium!
⇨ *Do not loosen the screw of the optional test connection while the sampling valve is pressurised.*

Danger of crushing due to moving actuator- and control shaft!
⇨ *Do not reach into the yoke as long as the pneumatic power is connected to the actuator.*
⇨ *Before working on the sampling valve, interrupt and lock pneumatic energy and the control signal.*
⇨ *Vent the actuator.*
⇨ *Do not allow the jamming of objects in the yoke to hinder the operation of the actuator- and control shaft.*
⇨ *If the actuator- and control shaft are blocked (e.g. due to "seizure" if not actuated for a long period of time"), release the residual energy of the actuator (spring tension) before releasing the blockage, see the corresponding actuator documentation.*
⇨ *Before disassembly the actuator, move the sampling valve to the safety position.*

Danger of injury due to escaping exhaust air!
During operation, when regulating or when opening and closing the sampling valve, exhaust air can escape, for example from the actuator.
⇨ *Wear eye protection and, if necessary, hearing protection hen working near valves.*

Danger of injury due to preloaded springs!
Actuators with preloaded actuator springs are pressurised.
⇨ *Release the compression from the preloaded springs before working on the actuator, see the corresponding actuator documentation.*

⚠ WARNING

Danger of injury due to residual medium in the sampling valve!
When working on the sampling valve, residual medium can escape and, depending on the medium properties, cause injuries (e.g. scalding, chemical burns).
⇨ *Wear protective garments, protective gloves and eye protection.*
⇨ *Do not loosen the screw of the optional test connection while the sampling valve is pressurised.*
⇨ *Bring the sampling valve into the open position so the pressure is released from the sampling ball.*

NOTE

Damage to the sampling valve due to excessively high or low tightening torques!
The sampling valve components must be tightened with specific torques. Excessively tightened components are subject to increased wear. Insufficiently tightened components can cause leakage.
⇨ *Observe the tightening torques, see Table 15-1 or Table 15-2 in chapter "15.1.1 Tightening torques".*

Damage to the sampling valve due to unsuitable tools!
⇨ *Only use tools approved by PFEIFFER, see chapter "15.1.3 Tools".*

Damage to the sampling valve due to unsuitable lubricants!
⇨ *Only use lubricants approved by PFEIFFER, see chapter "15.1.2 Lubricants".*

Info

The sampling valve was checked by PFEIFFER prior to delivery.
– *Certain test results certified by PFEIFFER are no longer valid when disassembling the sampling valve. This includes the test for seat leakage and the leak test (outer tightness).*
– *If maintenance and repair work is performed without approval from the After Sales Service of PFEIFFER, the product guarantee will be voided.*
– *Only use original parts from PFEIFFER as spare parts that correspond to the original specification.*
– *Wear parts are not covered by the warranty.*

9.1 Periodic tests

⇨ Depending on the conditions of use, the sampling valve must be checked at defined intervals in order to take remedial measures prior to possible malfunctions. The plant operator is responsible for preparing a suitable test plan
⇨ PFEIFFER recommends the following inspections that can be carried out during operation:

Test	Measures in the case of a negative test result
If present, check the optional test connection for tightness. **WARNING!** Danger of injury due to pressurised components and escaping medium! Do not loosen the screw of the test connection while the sampling valve is pressurised.	Decommission the sampling valve, see chapter "10 Decommissioning" Contact the After Sales Service at PFEIFFER for repairs, See chapter "12 Repairs".
Check the control shaft sealing for tightness from the outside.	The control shaft sealing with a PTFE V-ring packing is preloaded with a disc spring set and is therefore maintenance free.
Check the rotary movement of the actuator- and control shaft for smooth movement.	If the actuator- and control shaft are blocked, remove the blockage. **WARNING!** If the actuator- and control shaft are blocked (e.g. due to "seizure" if not actuated for a long period of time) they can release unexpectedly and move uncontrolled. This can lead to crushing if reaching into them. Before trying to release a blockage of the actuator- and control shaft, interrupt and lock the pneumatic energy and the control signal. Release the residual energy of the actuator (spring tension or compressed air reservoir) before releasing the blockage, see the corresponding actuator documentation.
If possible, check the fail-safe position of the sampling valve by briefly interrupting the power supply.	Decommission the sampling valve, see chapter "Decommissioning". Then determine the cause and remedy it, see chapter "8 Malfunctions".
Check pipe connections and seals of the sampling valve and actuator for leaks.	Regular maintenance work on the sampling valve is not necessary, but when checking the pipe section, no medium may escape from the flange and screw connections of the body or from the control shaft sealing.
Check the vent bore regularly to ensure that the media is able to flow out through the drainage line (in case the bottle is overfilled unintentionally) and to make sure it is not blocked.	On cleaning, observe the instructions described in chapter "1 Safety instructions and safety measures" and chapter "8 Malfunctions".

9.2 Maintenance work

⇨ The sampling valve must be prepared before all maintenance work, see chapter 12 "Repairs".

⇨ After all maintenance work, the sampling valve must be checked prior to recommissioning, see chapter "5.5 Checking the mounted sampling valve".

9.2.1 Replacing the seat rings and sampling ball

NOTE

Damage to the sealing surfaces on the seat rings and sampling ball due to incorrect maintenance!

⇨ *Always replace the metal seat rings and sampling balls together.*

⇨ Check the condition of the sampling ball and seat rings.

⇨ Remove the seat rings (10a and 10b) as described in Chapter "12.2 Replacing the seat rings and sampling ball". Check the seat rings as well as all plastic parts for damage and if in doubt replace them.

⇨ Also remove the sampling ball (9). Check the sampling ball as well as all plastic parts for damage and if in doubt replace them.

9.3 Ordering spare parts and consumables

Information about spare parts, lubricants and tools can be received from the After Sales Service at PFEIFFER.

Spare parts

Information on spare parts can be found in chapter "15.2 Spare parts".

10 Decommissioning

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task.

⚠ WARNING

Danger of burning due to hot or cold components and pipe!
Sampling valve components and pipes can become very hot or very cold during operation and cause burns upon contact.
⇨ *Let the components and pipes cool down or warm up.*
⇨ *Wear protective garments and protective gloves.*

Danger of injury due to pressurised components and escaping medium!
⇨ *Do not loosen the screw of the optional test connection while the sampling valve is pressurised.*

Danger of crushing due to moving actuator- and control shaft!
⇨ *Do not reach into the yoke as long as the pneumatic power is connected to the actuator.*
⇨ *Before working on the sampling valve, interrupt and lock pneumatic energy and the control signal.*
⇨ *Vent the actuator.*
⇨ *Do not allow the jamming of objects in the yoke to hinder the operation of the actuator- and control shaft.*
⇨ *If the actuator- and control shaft are blocked (e.g. due to "seizure" if not actuated for a long period of time"), release the residual energy of the actuator (spring tension) before releasing the blockage, see the corresponding actuator documentation.*
⇨ *Before disassembly the actuator, move the sampling valve to the safety position.*

Danger of injury due to escaping exhaust air!
During operation, when regulating or when opening and closing the sampling valve, exhaust air can escape, for example from the actuator.
⇨ *Wear eye protection and, if necessary, hearing protection when working near valves.*

Danger of injury due to residual medium in the sampling valve!
When working on the sampling valve, residual medium can escape and, depending on the medium properties, cause injuries (e.g. scalding, chemical burns).
⇨ *Wear protective garments, protective gloves and eye protection.*
⇨ *Do not loosen the screw of the optional test connection while the sampling valve is pressurised.*
⇨ *Bring the sampling valve into the open position so the pressure is released from the sampling ball.*

Observe the following points when decommissioning

To decommission the sampling valve for maintenance and repair work or for disassembly, perform the following steps:

⇨ Close the valves upstream and downstream of the sampling valve so that no medium flows through the sampling valve.
⇨ Empty the pipe and sampling valve completely.
⇨ Shut off the pneumatic power and lock it, to depressurise the actuator.
⇨ Let the pipe and sampling valve components cool down or warm up.

11 Removal

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task.

⚠ WARNING

Danger of burning due to hot or cold components and pipe!
Sampling valve components and pipes can become very hot or very cold during operation and cause burns upon contact.
⇨ *Let the components and pipes cool down or warm up.*
⇨ *Wear protective garments and protective gloves.*

Danger of crushing due to moving actuator- and control shaft!
⇨ *Do not reach into the yoke as long as the pneumatic power is connected to the actuator.*
⇨ *Before working on the sampling valve, interrupt and lock pneumatic energy and the control signal.*
⇨ *Vent the actuator.*
⇨ *Do not allow the jamming of objects in the yoke to hinder the operation of the actuator- and control shaft.*
⇨ *If the actuator- and control shaft are blocked (e.g. due to "seizure" if not actuated for a long period of time"), release the residual energy of the actuator (spring tension) before releasing the blockage, see the corresponding actuator documentation.*
⇨ *Wear eye protection and, if necessary, hearing protection when working near valves.*

Danger of injury due to residual medium in the sampling valve!
When working on the sampling valve, residual medium can escape and, depending on the medium properties, cause injuries (e.g. scalding, chemical burns).
⇨ *Wear protective garments, protective gloves and eye protection.*
⇨ *Do not loosen the screw of the optional test connection while the sampling valve is pressurised.*
⇨ *Bring the sampling valve into the open position so the pressure is released from the sampling ball.*

Danger of injury due to preloaded springs!
Actuators with preloaded actuator springs are pressurised.
⇨ *Before working on the actuator, release the compression from the preloaded springs.*

Prior to disassembly, make sure that the following conditions are met:

– The sampling valve is decommissioned, see chapter "10 Decommissioning".

11.1 Removing the sampling valve from the pipe

⇨ Loosen the flange connection.
⇨ Remove the sampling valve from the pipe, see chapter "4.3 Transporting and lifting the sampling valve".

⚠ WARNING

If a used valve is sent to PFEIFFER for service:
⇨ *Decontaminate the valves properly in advance.*

⇨ When returning a used valve, include the safety data sheet for the medium as well as confirmation of decontamination of the valve. Otherwise the valve will not be accepted.

Tip
– PFEIFFER recommends documenting the following contamination data in the form ▶ FM 8.7-6 "Declaration regarding the contamination of PFEIFFER valves and components".
– This form is available at ▶ www.pfeiffer-armaturen.com.

11.2 Disassembling the actuator

See the corresponding actuator documentation.

12 Repairs

If the operation of the sampling valve is no longer compliant or if it does not work at all, it is defective and must be repaired or replaced.

NOTE

Damage to the sampling valve due to improper maintenance and repair!

⇨ *Do not perform maintenance and repair work on your own.*

⇨ *Contact the After Sales Service at PFEIFFER for maintenance and repair work.*

In special cases, certain maintenance and repair work may be performed.

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task.

The following instructions apply additionally for sampling valves. For decommissioning and disassembly, observe chapter "10 Decommissioning" and chapter "11 Disassembly".

12.1 Replacing the V-ring packing

If a leak is found in the stuffing box flange (3), the PTFE rings of the V-ring packing (6) could be defective.

⇨ Check the condition of the V-ring packing.

Disassemble the sampling valve to remove the packing. For this purpose, observe chapter "1 Safety instructions and safety measures".

⇨ Place the sampling valve on an even and clean work surface so that the packing space is easy to reach.

⇨ Loosen the screws (8) and remove the stuffing box flange (3) carefully.

⇨ Remove the disc springs from the disc spring set (7).

⇨ Remove the V-ring packing (6).

⇨ Check the PTFE rings of the V-ring packing as well as all plastic and graphite parts for damage and, in the case of doubt, replace them.

⇨ Assemble the sampling valve as described in Chapter "3.5 Assembly of the sampling valve.

12.2 Replacing the seat ring and the sampling ball

If there is a leak in the passage, the seat rings (10a and 10b) and the sampling ball (9) can be defective.

⇨ Check the condition of the seats ring and the sampling ball.

Disassemble the sampling valve to remove the seat ring and sampling ball of the sampling valve. For this purpose, observe Chapter "1 Safety instructions and safety measures".

⇨ Place the sampling valve on an even and clean work surface so that the packing space is easy to reach.

⇨ Loosen the screws (8) and remove the stuffing box flange (3) carefully.

⇨ Remove the disc springs from the disc spring set (7).

⇨ Remove the V-ring packing (6).

⇨ Clamp the sampling valve into a bench vice at the body flange, with the "sampling area" on the bonnet side facing upwards, so that this area is easy to reach.

Bonnet disassembly for screw cap (standard)

⇨ Loosen the screws (15).

⇨ Carefully remove the bonnet with insert (14).

⇨ Remove funnel (16)

Bonnet disassembly for bayonet lock (option)

⇨ Disengage the locking pin (20), release the adapter (21) and remove.

⇨ Loosen the screws (19).

⇨ Carefully remove the bonnet with insert (18).

Further disassembly for both variants

⇨ Remove the seat ring (10b) with O-ring (13).

⇨ Carefully remove the sampling ball ((9). Turn the control shaft slightly to bring the sampling ball into a suitable position for disassembly.

⇨ Remove the seat ring (10a).

⇨ Check the seat rings and the ball as well as all plastic and graphite parts for damage and, in the case of doubt, replace them.

⇨ Assemble the sampling valve as described in Chapter "3.5 Assembly of the sampling valve. .

12.3 Additional repairs

⇨ In the case of additional major damage, it is recommended to have repairs performed by PFEIFFER.

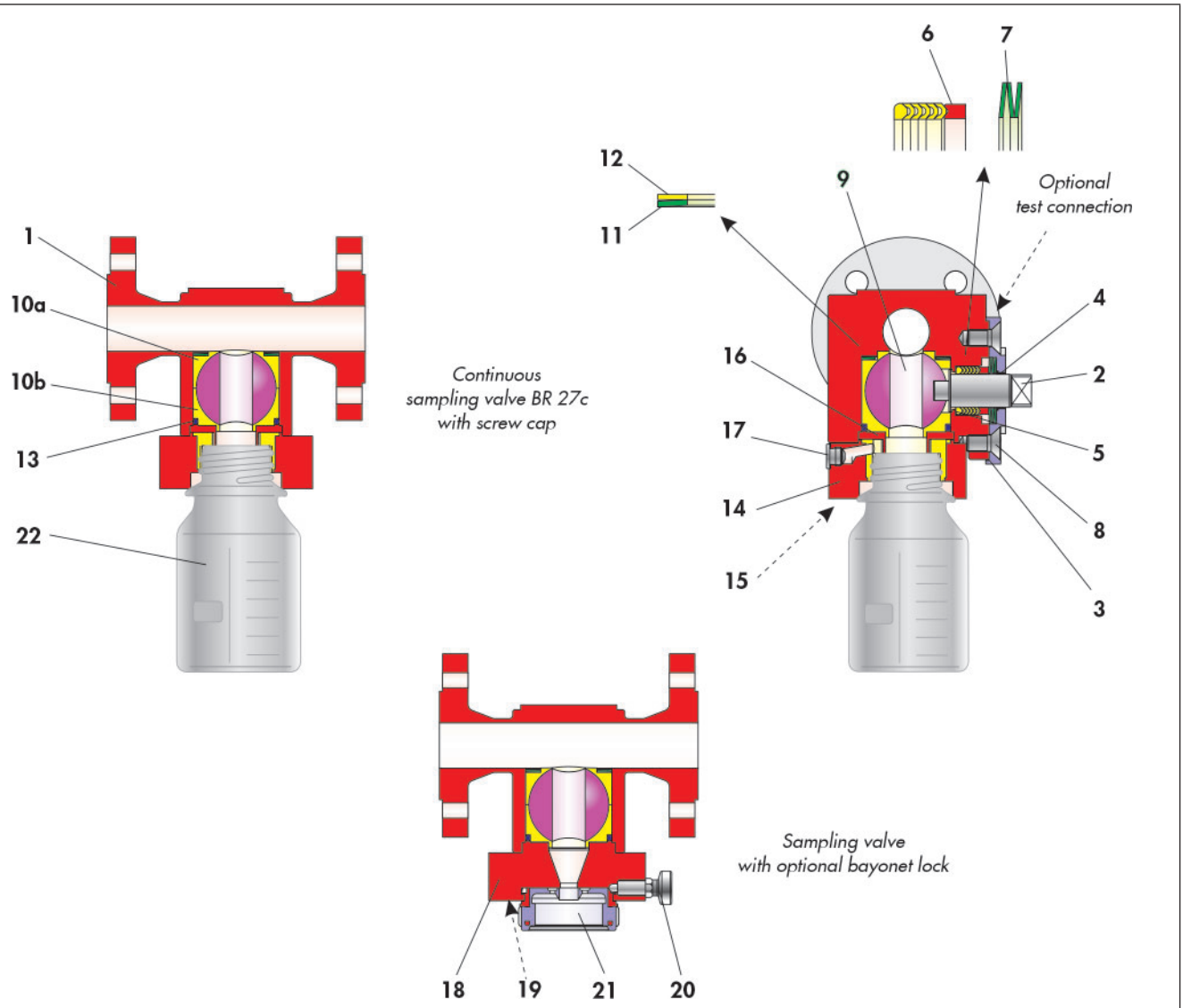


Figure 12-1: *Sectional drawing of the BR 27c sampling valve*

Table 12-1: *Parts list*

Sampling valve	
Item	**Description**
1	Main body
2	Control shaft
3	Stuffing box flange
4	Bearing bush
5	Bearing bush
6	V-ring packing
7	Disc spring set
8	Screw

Sampling set	
Item	**Description**
9	Sampling ball
10	Seat ring
11	Disc spring
12	Sealing disc
13	O-ring

Sampling container	
Item	**Description**
22	Sampling bottle

Screw-on bonnet (standard)	
Item	**Description**
14	Bonnet
15	Screw
16	Funnel
17	Screw plug

Bonnet with bayonet lock (option)	
Item	**Description**
18	Bonnet
19	Screw
20	Locking pin
21	Adapter

12.4 Sending devices to PFEIFFER

Defective sampling valves can be sent to PFEIFFER for repair.

Proceed as follows to send devices:

⚠ WARNING

Danger due to a contaminated sampling valve!

⇨ *When returning a used valve to PFEIFFER for service,* decontaminate the valve properly in advance.

⇨ *When returning a used valve, include the safety data sheet for the medium as well as confirmation of decontamination of the valve. Otherwise the valve will not be accepted.*

Tip

– PFEIFFER recommends documenting the following contamination data in the form ▶ FM 8.7-6 "Declaration regarding the contamination of PFEIFFER valves and components".

– This form is available at ▶ www.pfeiffer-armaturen.com.

⇨ Include the following information for returns:

- Manufacturer number
- Sampling valve type
- Article number
- Nominal size and version of the sampling valve
- Manual valve/automated valve
- Medium (designation and consistency)
- Medium pressure and temperature
- Flow rate in m^3/h
- Bench range of the actuator
- Number of actuations (year, month, week or day)
- Installation drawing if available
- Completed declaration regarding contamination. This form is available at ▶ www.pfeiffer-armaturen.com.

13 Disposal

⇨ For disposal, observe the local, national and international regulations.

⇨ Do not dispose of old components, lubricant and hazardous materials with domestic waste.

14 Certificates

The declaration of conformity is available on the following pages:

- Declaration of conformity according to Pressure Equipment Directive 2014/68/EU for automated valves, see page 14-2.
- Declaration of conformity according to Pressure Equipment Directive 2014/68/EU for manually operated valves, see page 14-3.
- Declaration of conformity for completed machinery according to Machinery Directive 2006/42/EC for the sampling valve BR 27c, see page 14-4.
- Declaration of conformity for partly completed machinery according to Machinery Directive 2006/42/EC for sampling valve BR 27c, see page 14-5.

The printed certificates correspond to the status at the time of printing. Further optional certificates are available upon request.

DECLARATION OF CONFORMITY

As per Pressure Equipment Directive 2014/68/EU
TRANSLATION

The manufacturer	**PFEIFFER Chemie-Armaturenbau GmbH**, D47906 Kempen, Germany
declares that:	**Type 27c Continuous inline sampling valve (BR 27c), with packing** • **with pneumatic actuator** • **with free shaft end for subsequent mounting of a pneumatic actuator**

1. The valves are pressure accessories within the meaning of the **Pressure Equipment Directive 2014/68/EU** and conform with the requirements of this Directive.
2. They may only be operated observing the Mounting and operating instructions ▶ EB 27c.

The commissioning of these valves is only permitted after the valve has been installed from all sides in the pipeline and a risk of injury can be ruled out.

(See ▶ EB 27c, Chapter 1 for sampling valves intended for dead-end service)

Applied standards

AD 2000 Regulations	Regulations for pressurized valve body parts
DIN EN ISO 4796	Laboratory glassware

Type designation and technical features:

PFEIFFER data sheet ▶ TB 27a

NOTE: This Manufacturer's Declaration applies to all valve types listed in this catalogue.

Applied conformity assessment procedure:

Conforming to Annex III of the Pressure Equipment Directive 2014/68/EU, Module H

Name of notified body:	*Identification number of the notified body:*
TÜV Anlagentechnik GmbH Am Grauen Stein 51101 Köln Germany	0035

These Declarations become invalid when modifications are made to the sampling valves and/or assemblies that affect the technical data of the sampling valve or the <Intended use> described in ▶ EB 27c, section 1 of the Mounting and operating instructions and considerably change the valve or an assembly delivered with it.

Kempen, 29. April 2023

i. V.

Stefan Czayka
Head of Quality Management/IMS Representative

SMART IN FLOW CONTROL 1 of 1 HE 2014-68-EU_BR27c-01_EN

DECLARATION OF CONFORMITY

As per Pressure Equipment Directive 2014/68/EU
TRANSLATION

The manufacturer	**PFEIFFER Chemie-Armaturenbau GmbH**, D47906 Kempen, Germany
declares that:	**Type 27c Continuous inline sampling valve (BR 27c), with packing** • **with lever for 90° operation**

1. The valves are pressure accessories within the meaning of the **Pressure Equipment Directive 2014/68/EU** and conform with the requirements of this Directive.
2. They may only be operated observing the Mounting and operating instructions ▶ EB 27c.

(See ▶ EB 27c, Chapter 1 for sampling valves intended for dead-end service)

Applied standards

AD 2000 Regulations	Regulations for pressurized valve body parts
DIN EN ISO 4796	Laboratory glassware

Type designation and technical features:

PFEIFFER data sheet ▶ TB 27a
NOTE: This Manufacturer's Declaration applies to all valve types listed in this catalog.

Applied conformity assessment procedure:

Conforming to Annex III of the Pressure Equipment Directive 2014/68/EU, Module H

Name of notified body:	*Identification number of the notified body:*
TÜV Anlagentechnik GmbH Am Grauen Stein 51101 Köln Germany	0035

These Declarations become invalid when modifications are made to the sampling valves and/or assemblies that affect the technical data of the sampling valve or the <Intended use> described in ▶ EB 27c, section 1 of the Mounting and operating instructions and considerably change the valve or an assembly delivered with it.

Kempen, 29. April 2023

i.V.

Stefan Czayka
Head of Quality Management/IMS Representative

SMART IN FLOW CONTROL 1 of 1 HE 2014-68-EU_BR27c-02_EN

EU DECLARATION OF CONFORMITY
TRANSLATION

The manufacturer	**PFEIFFER Chemie-Armaturenbau GmbH**, 47906 Kempen, Germany
declares for the listed products that:	**Type 27c Continuous inline sampling valve (BR 27c)** • **with a Type 31a spring closing Quarter-turn Actuator (BR 31a)** • **with a spring closing rotary actuator of a different make** Prerequisite: the unit was sized and assembled by PFEIFFER Chemie-Armaturenbau GmbH. The serial number on the valve refers to the entire unit.

1. It complies with all applicable requirements stipulated in **Machinery Directive 2006/42/EC**.
2. In the delivered state, the valve with actuator is considered to be final machinery as defined in the above-mentioned directive.

The start-up of these units is only permitted after the valve has been installed from both sides in the pipeline and a risk of injury can be ruled out as a result.

Referenced standards:

a) VCI, VDMA, VGB: "Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen, Mai 2018" [German only]

b) VCI, VDMA, VGB: "Zusatzdokument zum Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen vom Mai 2018" [German only], based on DIN EN ISO 12100:2011-03

Product description and technical features:

Tight-closing cavity-free inline valve designed to sample liquids from flowing media without bypass, automated with a single-acting 90° piston actuator for butterfly valves, ball valves and other valves with rotating throttle bodies.
For product descriptions refer to:
PFEIFFER data sheet for Type 27c Sampling valve ▶ TB 27a
PFEIFFER data sheet for Type 31a Actuator ▶ TB 31a
PFEIFFER mounting and operating instructions for Type 27c Sampling valve ▶ EB 27c
PFEIFFER mounting and operating instructions for Type 31a Actuator ▶ EB 31a
Valve accessories (e. g. positioners, limit switches, solenoid valves, lock-up valves, supply pressure regulators, volume boosters and quick exhaust valves) are classified as machinery components and do not fall within the scope of the Machinery Directive as specified in § 35 and § 46 of the Guide to Application of the Machinery Directive 2006/42/EC issued by the European Commission.

This declaration becomes invalid when modifications are made to the sampling valves and/or assemblies that affect the technical data of the sampling valve or the intended use (▶ EB 27c, section 1) and considerably change the valve or an assembly delivered with it.

Persons authorized to compile the technical file:

Kempen, 29 April 2023

i.V.

Stefan Czayka
Head of Quality Management/IMS Representative

SMART IN FLOW CONTROL. 1 of 1 HE 2006-42-EC_BR27c-01_EN

DECLARATION OF CONFORMITY

TRANSLATION

The manufacturer	**PFEIFFER Chemie-Armaturenbau GmbH**, 47906 Kempen, Germany
declares for the listed products that:	**Type 27c Continuous inline sampling valve (BR 27c)** • **with free shaft end**

1. In the delivered state, the valve prepared for mounting on a spring closing rotary actuator (not a clearly defined actuator system) is considered to be partly completed machinery as defined in the **Machinery Directive 2006/42/EC**.

Machinery is considered to be partly completed machinery when the machinery manufacturer has not determined all required specifications such as model type, thrusts, torques etc.

The start-up of these units is only permitted after the valve has been installed from both sides in the pipeline and a risk of injury can be ruled out as a result.

Referenced standards:

a) VCI, VDMA, VGB: "Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen, Mai 2018" [German only]

b) VCI, VDMA, VGB: "Zusatzdokument zum Leitfaden Maschinenrichtlinie (2006/42/EG) – Bedeutung für Armaturen vom Mai 2018" [German only], based on DIN EN ISO 12100:2011-03

Product description and technical features:

Tight-closing cavity-free inline valve designed to sample liquids from flowing media without bypass.

For product descriptions refer to:
PFEIFFER data sheet for Type 27c Sampling valve ▶ TB 27a
PFEIFFER mounting and operating instructions for Type 27c Sampling valve ▶ EB 27c

Valve accessories (e. g. positioners, limit switches, solenoid valves, lock-up valves, supply pressure regulators, volume boosters and quick exhaust valves) are classified as machinery components and do not fall within the scope of the Machinery Directive as specified in § 35 and § 46 of the Guide to Application of the Machinery Directive 2006/42/EC issued by the European Commission.

This declaration becomes invalid when modifications are made to the sampling valves and/or assemblies that affect the technical data of the sampling valve or the intended use (▶ EB 27c, section 1) and considerably change the valve or an assembly delivered with it.

Persons authorized to compile the technical file:

Kempen, 29 April 2023

i.V.

Stefan Czayka
Head of Quality Management/IMS Representative

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15 Annex

15.1 Tightening torques, lubricant and tools

15.1.1 Tightening torques

Info

[1] The tightening torques stated in the tables can only be understood as very rough and non-binding guide values and refer to a coefficient of friction of 0.2µ. Lubricating the threads leads to indeterminate tightening conditions.

15.1.1.1 Stuffing box flange

For the assembly of the stuffing box flange, the screw connections are tightened in a criss-cross pattern with the tightening torques indicated below.

Table 15-1: *Stuffing box flange tightening torques*

Nominal size		Qty.	Thread (8)	Tightening torque [1]
DN	NPS			
25	1	2	M10	44 Nm
40	1½	2	M10	44 Nm
50	2	2	M10	44 Nm
80	3	2	M10	44 Nm
100	4	2	M10	44 Nm

15.1.1.2 Bonnet

For the assembly of the bonnet, the screw connections are tightened in a criss-cross pattern with the tightening torques indicated below.

Table 15-2: *Bonnet tightening torques*

Deckelausführung	Qty.	Thread (15 / 19)	Tightening torque [1]
Für Schraubverschluss	4	M10	44 Nm
Für Bajonettverschluss	4	M10	44 Nm

15.1.1.3 Flange connection

Table 15-3: *Flange connection torque*

DN [mm]	PN [bar]	Thread	Tightening torques [Nm] for sealing units [2]		Tightening method [5]
			A	B	
25	10 ... 40	M12	50	50	I
40		M16	125 [3]	80	
50		M16			
80		M16			
100	10 ... 16	M16	125 [3]	80	I
	25 ... 40	M20	240 [4]	150	

[2] These tightening torques were calculated by the company BASF SE and confirmed by partner companies.
[3] Recommended lever length 300 mm.
[4] Recommended lever length 550 mm.
[5] I) With manually-operated spanner with a suitable extension if necessary.
II) With a torque wrench or other torque-controlled procedure.

Info

Required tightening torques for assembly for flanges according to DIN EN 1092-1 type 11 and connecting elements (e.g. screws, threaded pins) made of 25CrMo4 / A4-70 or a comparable strength.
The values are taken from the "Guidelines for assembly of flange connections in processing plants" of the VCI (Verband der Chemischen Industrie e.V.).

Table 15-4: *Sealing unit A*

Seal	Nominal pressure	Description
Flat seal	PN 10 to PN 25	Without inner eyelet
	PN 40	With inner eyelet
Shaft ring seals PN 40 are covered by this. Flat seals with inner eyelet for PN 10 - 25 are already covered, providing that the required characteristic values are complied with.		

Table 15-5: *Sealing unit B*

Seal	Nominal pressure	Description
Seal for tongue and groove flanges	PN 10 to PN 40	With fibre gaskets and metal-reinforced graphite gaskets
Grooved gasket		-
Spiral gasket with graphite		-

15.1.2 Lubricant

Table 15-6: *Recommended lubricant*

Use	Temperature range	Lubricant
Screws and nuts	-10 ... +200 °C	Heavy-duty grease paste (e.g. Gleitmo 805, manufacturer Fuchs) Not suitable for grease-free sampling valves or for use with oxygen
Screws and nuts	High temperature	Heavy-duty grease paste Molykote 1000

15.1.3 Tools

Suitable tools are required to work on the sampling valve. Unsuitable tools can damage the sampling valve.

15.2 Spare parts

PFEIFFER recommends spare part sets for “Commissioning” and for “2-year operation”

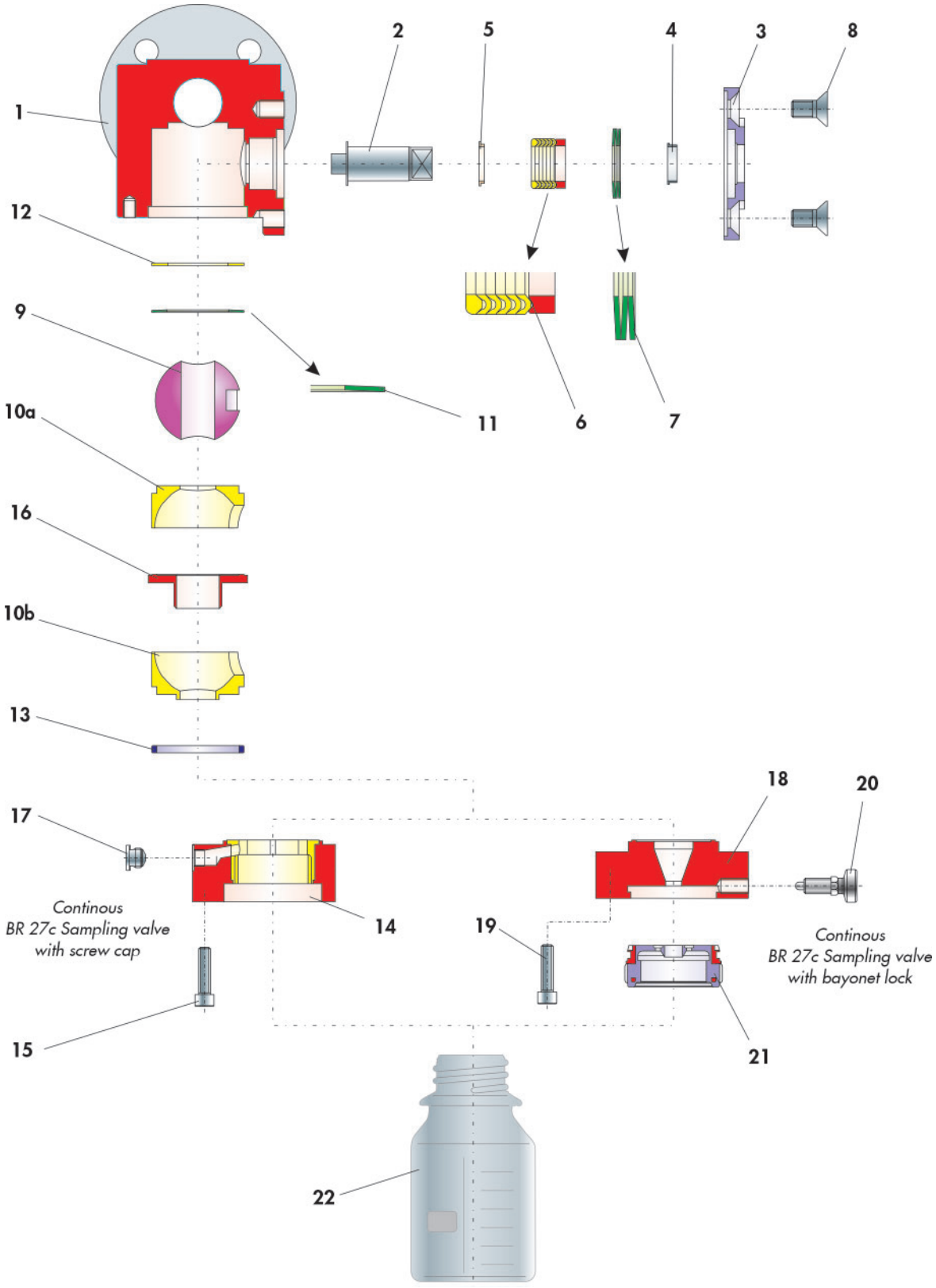

Fig. 15-1: *Exploded drawing of the BR 27a Sampling valve*

Table 15-7: *Recommend spare parts*

BR 27c Sampling valve

Item	Description	Material [1]	Commissioning	2-year operation
1	Main body	1.4571 / A351 CF8M		
2	Control shaft	1.4571 • 1.4462 / A351 CF8M • A182 Gr. F51		•
3	Stuffing box flange	1.4571		
4	Bearing bush	PTFE with carbon	•	•
5	Bearing bush	PTFE with glass	•	•
6	V-ring packing	PTFE / 1.4305	•	•
7	Disc spring set	1.8159 / Deltatone	•	•
8	Screw	A4-70		

Sampling set

Item	Description	Material [1]	Commissioning	2-year operation
9	Sampling ball	1.4571 • 1.4462		•
10	Seat ring	M-PTFE • PTFE	•	•
11	Disc spring	1.4310	•	•
12	Sealing disc	PTFE	•	•
13	O-ring	Viton	•	•

Screw-on bonnet (standard)

Item	Description	Material [1]	Commissioning	2-year operation
14	Bonnet	1.4571 / PTFE • 1.4571 / PTFE with glass		
15	Screw	A4-70		
16	Funnel	1.4571		
17	Screw plug	PTFE		

Bonnet with bayonet lock (option)

Item	Description	Material [1]	Commissioning	2-year operation
18	Bonnet	1.4571		
19	Screw	A4-70		
20	Locking pin			
21	Adapter	1.4313 / PFA		

Sampling container

Item	Description	Material [1]	Commissioning	2-year operation
22	Sampling bottle	Glass		

[1] Standard materials, other materials possible.

15.3 Circuit diagram

Circuit diagram for the automation unit. Should you have any queries, please contact PFEIFFER.

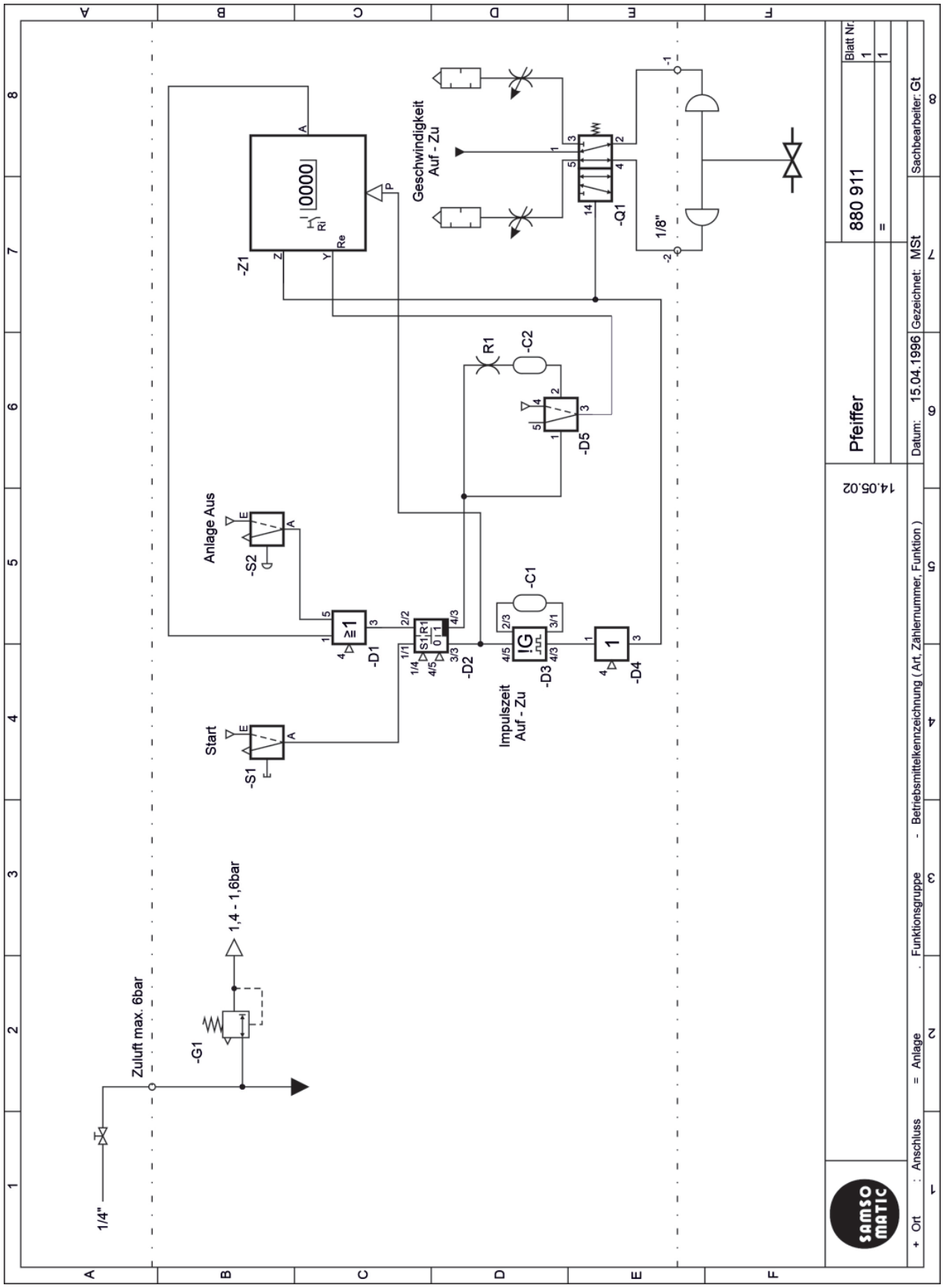

Fig. 15-2: *Circuit diagram*

15.4 Service

For maintenance and repair work as well as malfunctions or defects, contact the After Sales Service at PFEIFFER for support.

E-mail

The After Sales Service can be reached at the e-mail address "sales-pfeiffer-de@samsongroup.com".

Necessary data

Provide the following information in the case of questions and for troubleshooting:

- Manufacturer number
- Sampling valve type
- Article number
- Nominal size and version of the sampling valve
- Manual valve/automated valve
- Medium (designation and consistency)
- Medium pressure and temperature
- Flow rate in m^3/h
- Actuator signal pressure
- Number of actuations (year, month, week or day)
- Installation drawing if available
- Completed declaration regarding contamination. This form is available at ▶ www.pfeiffer-armaturen.com.

Further information

The indicated <data sheets> and further information are available, also in English, at the following address:

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