

MOUNTING AND OPERATING INSTRUCTIONS



EB 14t

Translation of the original manual



Control and shut-off valve type BR 14t - LTR 43
to combine with actuators

October 2024 edition



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 butterfly 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

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1 Safety instructions and safety measures

Intended use

The control and shut-off butterfly valve type BR 14t - LTR 43 is designed for use in combination with an actuator for the regulation of the volume flow, pressure and temperature of fluid, gaseous or vaporous media.

- The butterfly valve and its drive are designed for precisely defined conditions (e.g. operating pressure, utilised medium, temperature).

Therefore the operator must make sure that the butterfly 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 butterfly valve in other applications or environments, they must contact PFEIFFER.

- PFEIFFER shall not be held liable for damage that result from non-compliance with the intended use, as well as for damage that results from external forces or external influences.
- Limits of use, areas of use and possible uses can be found in the technical data and on the type plate.

Reasonably foreseeable misuse

The butterfly 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 attachments installed on the butterfly 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 butterfly valve may only be installed in observance of the recognised rules of technology, commissioned, serviced and repaired by specialist personnel.

- Specialist personnel in terms of this installation and operating manual are persons who, on the basis of their vocational education, knowledge and experience and knowledge of the relevant standards, are capable of evaluating the assigned tasks and identifying possible hazards.
- In the case of valves with an explosion-protection version, personnel must have been trained or instructed or be authorised to work on explosion-protected devices in plants at risk of explosion.

Personal protective equipment

PFEIFFER recommends obtaining information regarding the hazards resulting from the medium in use, for example using the GESTIS substance database.

Depending on the medium that is used and/or the respective activity, the following protective equipment, among others, may be necessary:

- Protective garments, protective gloves and eye protection when using hot, cold, aggressive and/or corrosive media
- Hearing protection when working in the vicinity of the butterfly valve
- Industrial safety helmet
- Safety harness, if there is a danger of falling (e.g. if working unsecured at a height)
- Safety shoes, e.g. with protection against static discharge
- Request additional protective equipment from the plant operator.

Changes and other modifications

Changes, conversions and other modifications to the valve are not authorised by PFEIFFER. They are made at your own risk and can lead to safety risks, for example, that cause the valve to no longer fulfil the prerequisites required for its use.

Protective devices

If the butterfly valve switches to a defined fail-safe position when the pneumatic energy fails, it depends on the utilised butterfly valve, see the corresponding actuator documentation. In the case of combinations of a butterfly valve with single-acting actuators, the butterfly valve automatically switches to a certain fail-safe position in case of a pneumatic energy failure, see Chapter 3. The fail-safe position corresponds to the effective direction and is indicated on the type plate.

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.

- Therefore, the operator and operating personnel must observe all the hazard information, warning information and information in this installation and operating manual.
- Hazards that result from the specific work conditions at the area of butterfly valve use must be determined in an individual risk assessment and made avoidable by corresponding instructions from the operator.

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.
- The operator is responsible that the limit values for the valve defined in the technical data are not undershot or exceeded.

Safety instructions and safety measures

- The start-up and shut-down processes are a part of the operating process and as such, are not a part of these installation and operating instructions. PFEIFFER cannot make a statement about these processes, as the operational details (e.g. differential pressures and temperatures) differ individually and are only known to the operator.

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 valve fulfils the requirements of the following European Directives:

- 2014/68/EU Pressure Equipment Directive
- 2006/42/EC Machinery Directive
- 2014/35/EU Low Voltage Directive
- 2014/30/EC Electromagnetic Compatibility
- 2014/34/EU Equipment and protective systems intended for use in potentially explosive atmospheres

In the case of valves provided with a CE marking, the Declaration of Conformity provides information about the conformity assessment procedure that was used, see Chapter 14.

Non-electrical actuators do not have their own potential ignition sources pursuant to the ignition hazard assessment in compliance with EN ISO 80079-36, even in the case of seldom occurring operational failures, and therefore are not subject to Directive 2014/34/EU.

⇒ For the connection to the equipotential bonding system, observe Paragraph 6.4 of EN 60079-14, VDE 0165-1.

– NACE

As regards the use or application of materials according to NACE MR0175 / ISO15156 as well as NACE MR0103 (materials in an environment containing H₂S) the designation of the standard in the material or test certificates does not indicate suitability for use of the butterfly valve.

This depends additionally on the operating and environmental parameters, to which generally only the plant operator has access. Therefore the suitability for use of such butterfly valves must always be checked by the plant manufacturer/operator.

– SIL

The suitability for use of butterfly valves in (SIL) protective circuits must be documented in separate agreements.

The below requirements are described in standards (e.g. VDI 2180, EN 61508, EN 61511) and in the applicable SAMSON Group Manual (Functional safety for control valves, rotary plug valves, ball valves and control butterfly valves; WA 236).

– Oxygen

Butterfly valve types BR 14t - LTR 43 are suitable for use in applications in which the oxygen content of the operating media is greater than or equal to 35% (Vol.). All parts coming into contact with the medium are cleaned oil and grease free and the butterfly valve is protected by means of a specific protective packaging against dirt and environmental influences.

All maintenance and repair work must be carried out in an oil and grease-free environment (clean room).

The utilised tools as well as personal equipment must comply with the cleanliness requirements.

The required cleanliness of the butterfly valve must be ensured through suitable measures prior to reinstallation.

For butterfly valves to be used in oxygen applications, when ordering spare parts, it must be specifically indicated that they are for "OXYGEN USE" and the corresponding measures must be observed.

Applicable documents

The following general and order-related documents apply in addition to this installation and operating manual:

- EB (Installation and operating manual) for the installed actuator
- EB for attachments (positioner, solenoid valve etc.)
- Data sheet ► TB 14t
- Safety manual ► SH 14t
- Manual ► WA 236
- Copy of the order-related type plate
- Order-related dimensional drawing (if agreed)

1.1 Notes regarding possible severe personnel injury

The following list indicates only generally-applicable information. The respective chapters can contain hazard information that, due to context, is provided in addition or is formulated slightly differently.

DANGER

Risk of bursting due to pressurised devices and components!

Butterfly valves and pipes are pressure equipment that can burst if handled improperly. Projecting, flying components, fragments and released pressurised medium can cause injuries or even death.

- ⇒ *Observe the maximum permissible pressure the butterfly valves and plant.*
- ⇒ *Empty the medium from the concerned plant parts and butterfly valve.*

⚠ DANGER**Danger due to falling of suspended loads!**

- ⇒ Do not stand under suspended loads.
- ⇒ Secure the transport paths.

Danger due to escaping medium as a result of unsuitable flange seals

Leaks caused by unsuitable flange seals can cause operating medium to escape. Flange leaks can cause fatal injury to personnel and damage the environment.

- ⇒ Use suitable flange seals.
- ⇒ Request special dimensions from PFEIFFER.

1.2 Notes regarding possible personnel injury

The following list indicates only generally-applicable warning information. The respective chapters can contain warning information that, due to context, is provided in addition or is formulated slightly differently.

⚠ WARNING**Danger of burning due to hot or cold components and pipes!**

Butterfly valves 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.

Hearing damage and deafness due to a high sound level!

Noise emissions depend on the version of the valve, the plant equipment as well as the utilised medium. During operation, medium-related noise emissions may be generated depending on the plant conditions. In addition, there may be a short-term high sound pressure level when a pneumatic actuator or pneumatic attachment is suddenly ventilated without noise-reducing elements. Both can damage hearing.

- ⇒ Wear hearing protection when working in the vicinity of the valve.

Danger of injury due to escaping exhaust air!

During operation, when regulating or when opening and closing the butterfly valve, exhaust air can escape, for example from the actuator.

- ⇒ Install the valve such that the actuator does not ventilate at eye level.
- ⇒ Use suitable silencers and plugs.
- ⇒ Wear eye protection when working in the vicinity of the actuator.

Danger of injury due to incorrect lifting without lifting equipment!

When lifting the valve without lifting equipment, injuries may occur, especially in the torso area, depending on the weight of the valve.

- ⇒ Observe the occupational health and safety regulations applicable at the installation site.

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

- ⇒ Only use approved lifting equipment and load lifting equipment whose lifting capacity corresponds at least to the weight of the valve and the packaging if applicable.

Danger of crushing due to moving parts!

The butterfly valve contains moving parts (e.g. shaft and wedge-lock-washer) that can lead to crushing if reaching into it.

- ⇒ During operation, do not reach into the bracket between the butterfly valve and the actuator.
- ⇒ Before working on the valve, interrupt and lock the pneumatic energy and the control signal.
- ⇒ Do not allow the jamming of objects in the bracket to hinder the rotation of the shaft.
- ⇒ In the case of a blocked shaft, contact PFEIFFER.

Danger of injury due to preloaded springs!

Valves that are equipped with preloaded actuator springs are under mechanical tension. The marking on the actuator type plate indicates whether a spring return is available and the fail-safe position. The marking on the type plates is described in the instruction manuals for the actuators.

- ⇒ Release the compression from the preloaded springs before working on the actuator, see the corresponding actuator documentation.

Danger of injury due to moving parts with spring-loaded actuators

Spring-loaded actuators may only be pressurised when installed in the pipe and not to perform work on the valve outside of the pipe. There is risk of fatal injury if the pneumatic energy suddenly fails and the valve disc moves automatically to the fail-safe position by means of spring force.

For devices that have a spring-loaded actuator with a "fail open" fail-safe position, the control and shut-off valve must be installed in the open position, for example by removing the pipe. The sealing surfaces may not be damaged during this operation.

Danger of injury due to residual medium in the butterfly valve!

When working on the butterfly valve, residual medium can escape and, depending on the medium properties, cause injuries (e.g. scalding, chemical burns).

- ⇒ If possible, empty the medium from the concerned plant parts and control and shut-off valve.
- ⇒ Wear protective garments, protective gloves and eye protection.

Danger of injury due to pressurised components and escaping medium!

- ⇒ Do not loosen pressurised components.

Danger of injury due to static charge

- ⇒ If there is a risk of static charge of the butterfly valve, the operator must ensure, to avoid it, that a suitable ground connection is installed in the provided position.

! WARNING

Danger of injury due to incorrect operation, use or installation caused by illegible information on the butterfly valve!

Over time, imprints or impressions on the valve can soil the adhesives and signs or make them illegible for other reasons so that dangers are not recognised and necessary operational messages cannot be followed. Danger of injury can occur.

- ⇒ Keep all relevant markings on the device legible at all times.
- ⇒ Damaged, missing or faulty signs or adhesives must be replaced immediately.

Functional impairment of the butterfly valve due to oil leaking from the hand pump!

- ⇒ Observe the agreed and documented actuator/valve alignment.

Dangers due to use of the butterfly valve as an end fitting!

During normal operation, in particular with gaseous, hot and/or hazardous media, spraying medium can cause hazards.

- ⇒ A blind flange must be assembled on the free connecting pieces or the butterfly valve must be secured against unauthorised actuation.
- ⇒ If a butterfly valve is 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 butterfly valve due to contamination (e.g. solid particles) in the pipes!

The plant operator is responsible for cleaning the pipes in the plant.

- ⇒ Rinse the pipes prior to commissioning.

Damage to the butterfly valve due to unsuitable medium properties!

The butterfly valve is designed for a medium with certain properties.

- ⇒ Only use a medium that corresponds to the design criteria.

Damage to the butterfly valve and leakage due to excessively high or low tightening torques!

The butterfly valve components must be tightened with specific torques. Excessively tightened components are subject to increased wear. Insufficiently tightened components can cause leakage.

- ⇒ Comply with the specified tightening torques, see Chapter "15.1.1 Tightening torques"

Damage to the butterfly valve due to unsuitable tools!

Unsuitable tools can damage the valve.

- ⇒ Suitable commercially available tools are needed to work on the butterfly valve, see Chapter "15.1.3 Tools".

! NOTE

Damage to the butterfly valve due to unsuitable lubricants!

The functionality of the butterfly valve is ensured only by using a certain lubricant. Unsuitable lubricants can corrode and damage the surface.

- ⇒ The butterfly valve material requires suitable lubricants, see Chapter "15.1.2 Lubricants".

Medium contamination due to unsuitable lubricants and contaminated tools and components!

- ⇒ If required, for example for oxygen applications, keep the butterfly valve and utilised tools free from solvents and greases.
- ⇒ Only use suitable lubricant, see Chapter "15.1.2 Lubricant"

1.4 Warning notes on the device

Warning of moving parts.



Figure 1-1: Example of the warning information

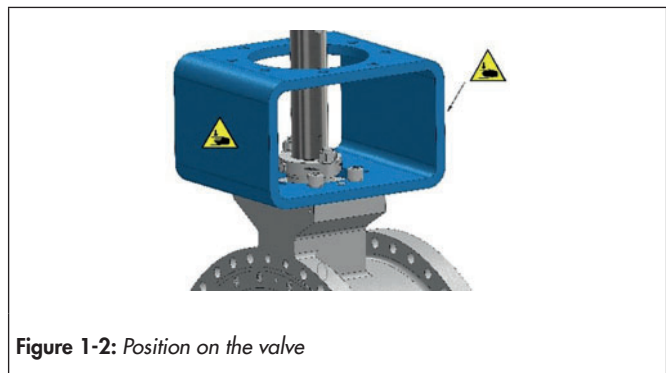


Figure 1-2: Position on the valve

There is a risk of crushing due to the rotation of the shaft, especially during fast rotation movements, when reaching into the bracket as long as the pneumatic energy is connected to the actuator.

2 Markings on the device

2.1 Control and shut-off valve type plate

The butterfly valves are marked with a metal type plate that is fastened to the butterfly valve or, if required, in another suitable location of the valve (e.g. extension, bridge).

Conformity with the Pressure Equipment Directive is confirmed when the type plate bears the CE symbol with the ID number of the notified body.

The plate provides the following information:

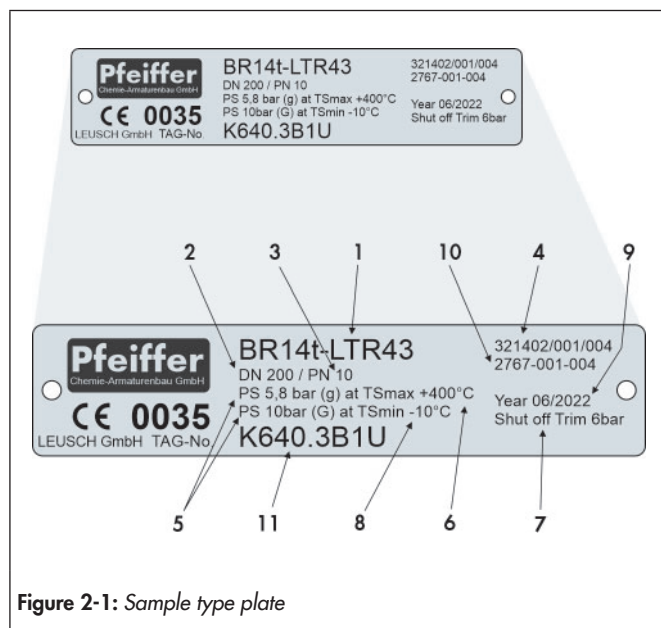


Figure 2-1: Sample type plate

Table 2-1: Meaning of the positions on the type plate

| Pos. | Meaning of the marking position |
|------|--|
| 1 | Butterfly valve type |
| 2 | Nominal size (DN or NPS) |
| 3 | Nominal pressure level (PN or CL) |
| 4 | Order number |
| 5 | Permissible pressure (PS) |
| 6 | Permissible maximum temperature (TSmax.) |
| 7 | Maximum permissible differential pressure on the shut-off trim (P shut-off trim) |
| 8 | Permissible minimum temperature (TSmin) |
| 9 | Year and month of manufacture (Date) |
| 10 | Remarks |
| 11 | Test point no. if available (Tag no.) |

The current type plates are attached to the final documentation for each order.

The preferable pressure force direction is marked by a direction arrow that is integrated in the butterfly valve body or is fastened as a metal label on the body in a suitable position. Further information can be provided on additional metal labels.

2.2 Actuator type plate

See the corresponding actuator documentation.

2.3 Material markings

The material markings for bodies and wedge-lock-washers are cast into or stamped onto the respective components.

3 Design and principle of operation

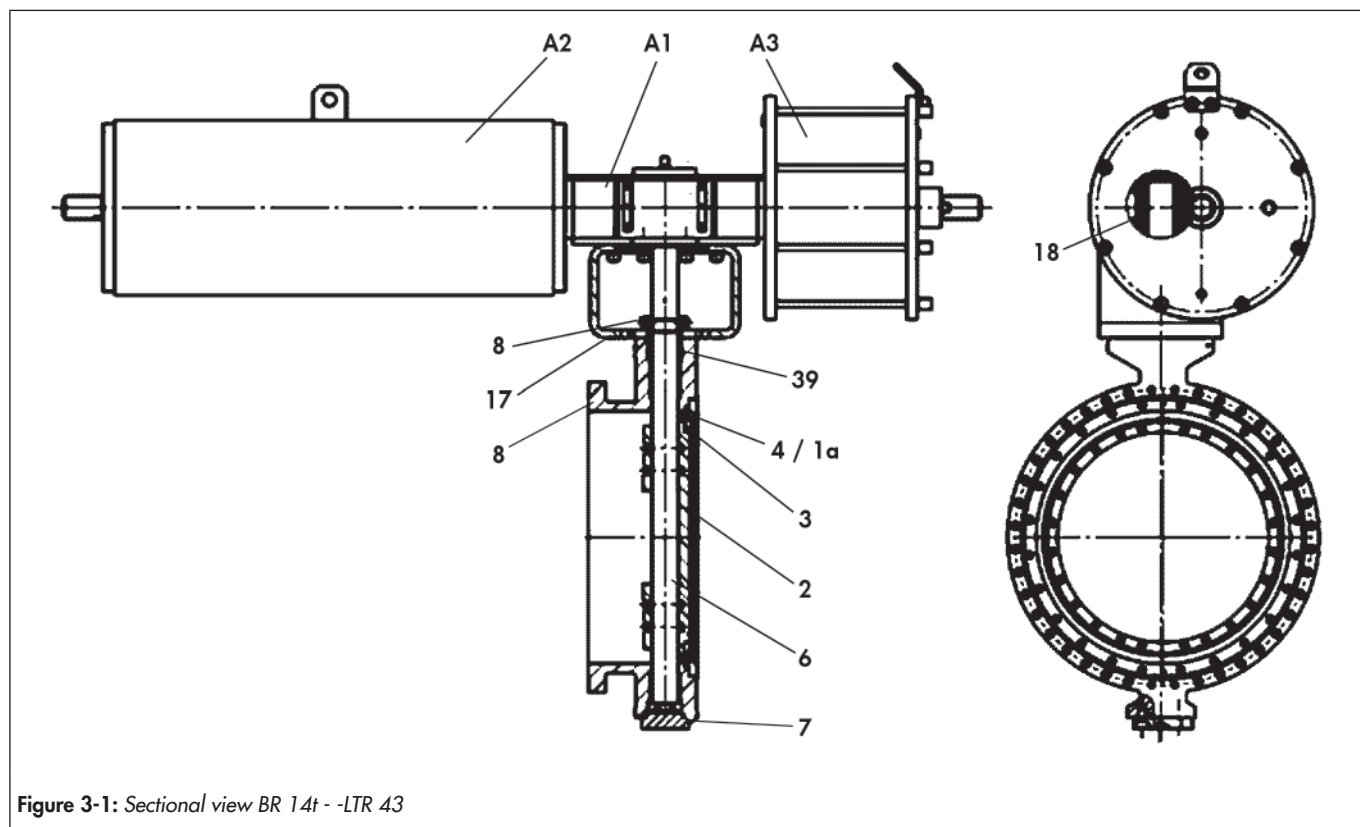


Figure 3-1: Sectional view BR 14t - LTR 43

Table 3-1: Parts list

| Pos. | Designation |
|------|-------------|
| 1 | Body |
| 2 | Disc |
| 3 | Seal ring |
| 4 | Seat |
| 6 | Shaft |
| 7 | Cover |
| 8 | Gland |

| Pos. | Designation |
|------|-----------------------------|
| 17 | Bracket |
| 18 | Coupling |
| 39 | Packing |
| A1 | Centre console actuator |
| A2 | Spring cylinder actuator |
| A3 | Pneumatic cylinder actuator |

The BR 14t - LTR 43 is a triple-eccentric control and shut-off butterfly valve. It is preferably combined with pneumatic actuators in the "rack and pinion" or "scotch-yoke" version, or can also be combined with electric or hydraulic actuators as well as manual gears.

The designed butterfly valve is available in different series for almost all applications and specifications for the control and shut-off of fluids.

The series differ in the structure of the sealing system. The following paragraph provides an example in order to explain the functionality of the valve. In the case of a special design or in combination with a different auxiliary energy, the functionality may differ slightly.

The butterfly valve body (1) either contains an installed replaceable seat (4) or it is integrated fixed in the body (1a). The respective seal ring (3) that is fastened to a disc (2) is connected with the actuator via a shaft (6). The actuator itself is fixed to the valve body by means of a bracket (17).

Adjusting the signal pressure that acts on the drive pistons (A3) changes the position of the wedge-lock-washer with respect to the seat, and therefore the flow rate. The springs (A2) installed in pneumatic actuators move the wedge-lock-washer with the seal ring into the respective fail-safe position if the pneumatic energy fails. The seal between the body and the shaft is guaranteed by the packing rings (39) pressed by a stuffing box (8).

Design and principle of operation

The butterfly valve reaches its maximum tightness when it is operated according to the preferable pressure force direction (FTC) when installed in the pipe system. The preferable pressure force direction is indicated by an arrow on the side of the body.

Fail-safe positions

If the butterfly valve switches to a defined fail-safe position when the pneumatic energy fails, it depends on the utilised butterfly valve, see the corresponding actuator documentation.

The position of the wedge-lock-washer is indicated by two red dots just above the stuffing box. When the butterfly valve is closed, the imaginary connection axis is the red marks at a right angle to the flow direction. When the actuator shaft rotates clockwise, the butterfly valve closes (clockwise to close).

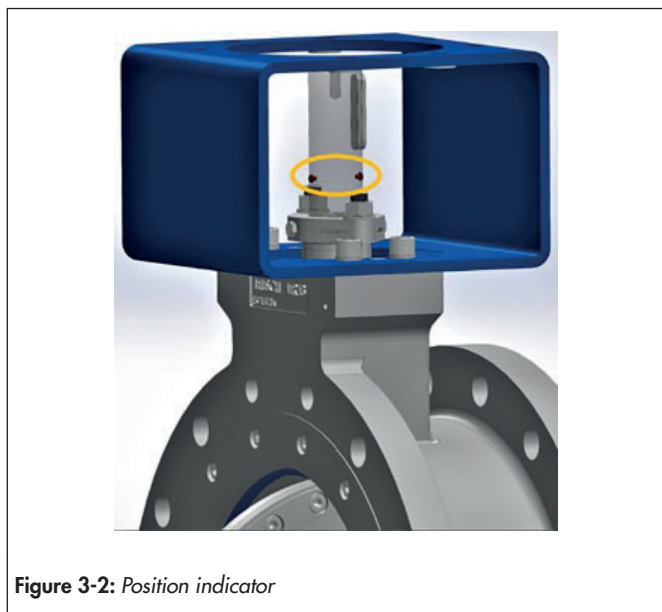


Figure 3-2: Position indicator

Valve closed by springs (FS)

Upon reduction of the signal pressure or failure of the pneumatic energy, the springs move the actuator shaft clockwise and close the butterfly valve.

The butterfly valve opens when the signal pressure increases, acting against the force of the springs.

Valve opened by springs (FÖ)

Upon reduction of the signal pressure or failure of the pneumatic energy, the springs move the actuator shaft counterclockwise and open the butterfly valve.

The butterfly valve closes when the signal pressure increases, acting against the force of the springs.

3.1 Variants

For very high or very low temperatures, the butterfly valve can be provided with a body extension and, for example, insulated with a cold-box cover.

Various variants and special designs, such as a heating jacket body, sealing gas connections, exterior bearing points, oxygen versions, TA-Luft seals, etc. are available upon request.

3.2 Additional optional components on the valve

Body extension

For operating or design temperatures below -60 °C (-76 °F) or above 350 °C (662 °F), the valve are equipped standard with a body extension (insulation part), see Chapter "5.2 Preparing for assembly".

Grip protection

In the case of conditions of use that require a high level of safety (e. g. if the valve is freely accessible to untrained specialist personnel), grip protection must be provided to exclude the risk of crushing due to moving parts (actuator shaft). The decision whether to use grip protection is the responsibility of the plant operator and depends on the risk potential of the individual plants and their respective conditions.

Noise reduction

Trims with flow dividers can be used to reduce noise emissions.

Fixed assembly plates on the actuator for control accessories.

For optimal accessibility and maintenance, the actuator accessories can be fit on a central plate as the operator level, depending on the application.

Weather protection equipment

To protect the valve function against the risk of pitting due to the entry of foreign material (e.g. sand) between the stuffing box and the shaft, additional cover plates can be attached to the bracket upon customer request.

To protect the actuator accessory (e.g. solenoid valve, positioner) against the sun, rain and other environmental influences, additional protective devices can be attached upon customer request.

Fire-resistant insulation

Upon customer request, the fire resistance of the valve with respect to the installation environment can be increased by means of individually customised fire protection equipment.

! WARNING

Danger of burns due to heated components!

Additional optional components can become very hot during operation and cause burns upon contact.

⇒ *Let components and pipes cool down.*

⇒ *Wear protective garments and protective gloves.*

3.3 Control-related additional equipment

For valves such as rotary valves, the following accessories are available, for example, either individually or in combinations:

- Positioner
- Limit switch
- Solenoid valves
- Filter - reducing station
- Jacket heater

Other additional equipment is possible according to specifications on request.

3.4 Technical data

The type plates of the butterfly valve and actuator provide information about the butterfly valve version, see Chapter 2.1 and the actuator documentation.

Conformity

The butterfly valve type LTR 43 complies with the essential international standards, and is in particular both CE and EAC compliant.

Temperature range

Depending on the version, the butterfly valve is designed for a temperature range from -60 to $+400$ °C. The temperature range can be expanded using adapted material as well as an insulation and body extension.

Leakage class

The following leakage classes are available upon agreement and according to customer specifications:

- DIN EN 12266 Part 1 - Testing of metallic valves / ISO 5208 [Leakage class A – G]
- ANSI FCI 70-2 Control Valve Seat Leakage / DIN EN 60534-4 (Leakage class I-VI)
- Others upon agreement

Noise emissions

PFEIFFER cannot make a general statement about noise emission. Noise emissions depend on the version of the butterfly valve, the plant equipment as well as the utilised medium.

Dimensions and weights

The dimensions and weights can be found on the technical data sheet ▶ TB 14t or on the order-related dimensions sheet of the valve.

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.

4.1 Accepting delivery

Perform the following steps after receiving the goods:

1. Check the scope of supply. Compare the data on the butterfly valve type plate with the delivery note. For details about the type plate, see Chapter "2 Markings on the device".
2. Check the supply for transport damage. Report transport damage through the PFEIFFER office and the transport company, see the delivery note.
3. Select suitable lifting equipment and load handling devices according to the weight and dimensions of the valves to be transported and lifted, see the transport documentation and Chapter "3.4 Technical data".

4.2 Unpacking the valve

Observe the following procedures:

- ⇒ Unpack the valve directly before lifting for installation into the pipe.
- ⇒ Check the valve for damage.
- ⇒ Use suitable transport equipment for on-site transport.
- ⇒ Only remove the protective caps on the butterfly valve inlet and outlet directly before installation into the pipe. They protect the butterfly valve against damage by preventing the entrance of foreign material.
- ⇒ Dispose of the packaging according to local regulations.

4.3 Transporting and lifting the valve

⚠ DANGER

Danger due to falling of suspended loads!

- ⇒ Do not stand under suspended loads.
- ⇒ Secure the transport paths

⚠ WARNING

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

- ⇒ Only use approved lifting equipment and load lifting equipment whose lifting capacity corresponds at least to the weight of the valve and the packaging if applicable.

Danger of injury due to tipping of the valve!

- ⇒ Observe the centre of gravity of the valve.
- ⇒ Secure the valve against tipping and twisting.

⚠ WARNING

Danger of injury due to incorrect lifting without lifting equipment!

When lifting the valve without lifting equipment, injuries may occur, especially in the torso area, depending on the weight of the valve.

- ⇒ Observe the occupational health and safety regulations applicable at the installation site.

! NOTE

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

The lifting eye/eyebolts on the actuators are used only for actuator assembling and disassembling as well as for lifting the actuator without the butterfly valve. These fastening points are not intended for lifting the complete valve.

- ⇒ When lifting the valve, make sure that the entire load is carried by the sling that is fastened to the butterfly valve body.
- ⇒ Do not fasten the load-bearing sling to the actuator, hand wheel or other components.
- ⇒ Observe the conditions for lifting, see Chapter 4.3.2.
- ⇒ Do not use the control air lines, accessories or other components with safety functions for suspension or damage them.

4.3.1 Transporting the valve

The transport notes from the packaging (e.g. wooden box) must be followed. The valve can be transported using lifting equipment such as a crane or a forklift.

- ⇒ Comply with the transport conditions.

Transport conditions

- ⇒ Protect the valve against external influences, such as impacts.
- ⇒ Do not damage the corrosion protection (paint, surface coating). Report any damage immediately and remedy it after consultation.
- ⇒ Protect the pipes and any attachments from damage.
- ⇒ Protect the valve against moisture and dirt.
- ⇒ When the valve is in the standard version, the permissible transport temperature is from -20 to +65 °C.

4.3.2 Lifting the valve

When installing the valve in the pipe, suitable lifting equipment should be used, such as a crane or a forklift. Use suitable tested slings and suitable fastening to make sure that the surfaces and contact surfaces are not damaged, and that no other damage occurs to the valve (e.g. actuator accessories, piping, sealing elements).

Conditions for lifting

- ⇒ Use a hook with a safety clamp as the suspension element, see Figure 4-1, so that the sling cannot slip off the hook during lifting and transport.
- ⇒ 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 valve. Pay attention to the centre of gravity!
- ⇒ In the case of interruptions in work, do not leave the lifting equipment suspended in the air for a long period of time.

⚠ WARNING

Danger due to incorrect lifting and transport!

The lifting points for the lifting slings shown on the schematic drawing serve as examples for most valve variants. On site the conditions for lifting and transporting the butterfly valve can change however.

- ⇒ The operator makes sure that the butterfly valve is lifted and transported safely.



Figure 4-1: Sample lifting points for butterfly valves



Figure 4-2: Sample lifting points for valves

Version: Horizontal alignment

1. Use suitable tested slings and suitable fastening to lift the valve using suitable lifting equipment.
2. Lift the valve carefully. Check if the load lifting equipment holds.
3. Move the valve at a constant speed to the installation site.
4. Install the valve in the pipe, see chapter "5 Installation".
5. Remove the lifting slings after successful installation.

i Info

Upon request, PFEIFFER can provide comprehensive transport and lifting instructions. Contact PFEIFFER.

4.4 Storing the valve

! NOTE

Damage to the valve due to improper storage!

- ⇒ Comply with the storage conditions.
- ⇒ Avoid long storage periods.
- ⇒ In the case of deviating storage conditions and long storage, contact PFEIFFER.

i Info

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

Storage conditions

- ⇒ Protect the valve in its original packaging in a covered location in a clean and dry environment against external influences, such as impacts.

- ⇒ Secure the valve in the storage position against slipping or tipping over.
- ⇒ Do not damage the corrosion protection (paint, surface coating). Remedy any damage immediately.
- ⇒ Protect the valve against moisture and dirt and store at a relative humidity of <75 %. Prevent condensation in damp rooms. Use a desiccant or heater.
- ⇒ Make sure that the surrounding area is free of acids or other corrosive and aggressive media.
- ⇒ The permissible storage temperature for valves is from -20 to +65 °C.
- ⇒ No components may be placed on the valve.

Special storage conditions for elastomer

Example of elastomer: Actuator seals

- ⇒ To maintain the shape and avoid the formation of cracks, do not suspend or bend elastomers.
- ⇒ PFEIFFER recommends a storage temperature of 15 °C for elastomers.
- ⇒ Store elastomers separately from lubricants, chemicals, solutions and fuels.

5 Installation

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task. Observe chapter 4.3 for transport to the installation site.

5.1 Installation conditions

Operator level

The operator level for the valve is the front view on all operating elements of the valve from the perspective of operating personnel.

The plant operator must make sure that operating personnel can carry out all work after the butterfly valve is installed safely and can access it easily from the operator level.

Pipe routing

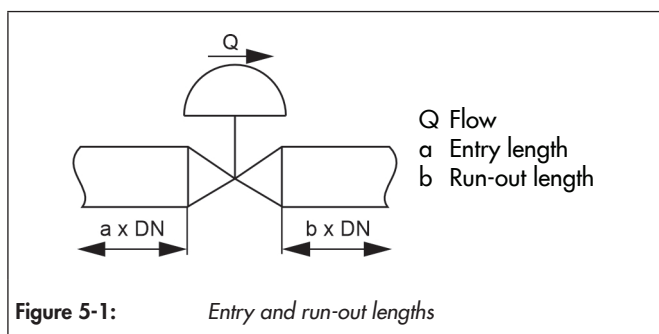


Table 5-1: Entry and run-out lengths

| Medium state | Butterfly valve conditions | Installation length a | Run-out length b |
|--------------|--|-----------------------|------------------|
| Gaseous | $Ma \leq 0.3$ | 2 | 4 |
| | $0.3 \leq Ma \leq 0.7$ | 2 | 10 |
| Vaporous | $Ma \leq 0.3$ ¹⁾ | 2 | 4 |
| | $0.3 \leq Ma \leq 0.7$ ¹⁾ | 2 | 10 |
| | Wet steam (Condensation percentage >5%) | 2 | 20 |
| Fluid | Cavitation free / $w < 10$ m/s | 2 | 4 |
| | Sound cavitation / $w \leq 3$ m/s | 2 | 4 |
| | Sound cavitation / $3 < w < 5$ m/s | 2 | 10 |
| | Critical cavitation / $w \leq 3$ m/s | 2 | 10 |
| | Critical cavitation / $3 < w < 5$ m/s | 2 | 20 |
| Flashing | - | 2 | 20 |
| Multi-phase | - | 10 | 20 |

¹⁾ no wet steam

The entry and run-out lengths depend on various variables and process conditions and are provided as a recommendation, see Table 5-1.

If the lengths recommended are significantly undershot, contact PFEIFFER.

The guidelines applicable on site apply for the installation of the butterfly valve in the pipe.

Install the butterfly valve so there is low vibration and no mechanical tension, use a support if necessary. Observe the sections "Installation orientation" and "Support and mounting" in this chapter.

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

Installation position

The recommended installation position of the BR 14t - LTR 43 butterfly valve must be selected so that the control shaft is always aligned parallel to the ground.

⇒ In the event of deviations from this installation position, contact PFEIFFER.

Installation position

The butterfly valves of the BR 14t - LTR 43 are designed such that it is possible to position the actuator/butterfly valve horizontally or vertically, whereby the standard version is vertical. The agreed and documented installation location must be observed. If it must be adjusted contact PFEIFFER.

WARNING

Functional impairment of the valve due to oil leaking from the hand pump in case of an incorrect installation position!

⇒ Observe the agreed and documented actuator and butterfly valve alignment.

Support and mounting

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

Attachments

When connecting the attachments, make sure that they can be operated from the operator level safely and with easy access.

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).

⇒ Ventilation must be oriented such that operating personnel is not endangered. The operator must evaluate the hazard due to noise and prevent it using suitable measures.

5.2 Preparing for assembly

⚠ DANGER

Danger due to escaping medium resulting from unsuitable flange seals!

Leaks caused by unsuitable flange seals can cause operating medium to escape. Flange leaks can cause fatal injury to personnel and damage the environment.

- ⇒ The butterfly valves of BR 14t - LTR43 have special dimensions, if applicable. It is indicated in the order confirmation or the dimension sheet if special dimensions are required.
- ⇒ Special dimensions can be requested from PFEIFFER.

Danger of injury due to moving parts with spring-loaded actuators!

Spring-loaded actuators may only be pressurised when installed in the pipe and not to perform work on the butterfly valve outside of the pipe. There is risk of fatal injury if the pneumatic energy suddenly fails and the valve disc moves automatically to the fail-safe position by means of spring force.

- ⇒ Install butterfly valves that have a spring-loaded actuator with the "fail open" fail-safe position in the open position. Remove the pipe if necessary.
- ⇒ Do not damage the sealing surface.

! NOTE

Employees or third parties may not be endangered.

Any applicable legal regulations of the country of destination must also be observed.

Other seals.

For other seals, such as spiral or grooved gaskets, the standardised dimensions may not be suitable.

- ⇒ Contact PFEIFFER for suitable special dimensions.
- ⇒ Upon request, PFEIFFER can supply these seals.

Damage to the butterfly valve due to incorrect insulation!

Insulate butterfly valves with a body extension with medium temperatures below -60 °C or above 350 °C only up to the maximum permissible height.

- ⇒ In the case of high temperature applications, insulate only the lowest third of the insulation part.
- ⇒ In the case of low temperature applications, insulate only the lowest two thirds of the entire length.
- ⇒ In the case of cold-box applications, insulate the cold-box cover up to the lower edge. If the insulation part is insulated at an impermissibly high level, it can lose its function!

i Info

The plant operator is responsible for cleaning the pipes in the plant.

Ensure the following conditions prior to assembly:

- The valve is clean.
- The valve and all attachments inclusive of the pipes are not damaged.
- The data on the type plate (type, nominal size, material, nominal pressure and temperature range) matches the plant conditions and conditions of use. For details about the type plate, see Chapter "2 Markings on the device".
- Additional optional components are installed or prepared to the point as required prior to the assembly of the valve, see Chapter "3.2 Additional optional components on the valve".
- Sufficient installation space is available.
- The pipe connections must be aligned plane-parallel, flush and tension-free.
- Measures for avoiding contact with hazardous media were found.
- All welding requirements have been met.

Perform the following preparation steps for assembly:

- Get the material and tools ready that are required for assembly.
- If the butterfly valve and actuator are already assembled together, check the screw connections for the correct tightening torques, see Chapter "15.1.1 Tightening torques". Components can loosen up during transport.

5.3 Assembling the butterfly valve

The tasks are listed below that are necessary for assembly and prior to the commissioning of the butterfly valve.

Make sure before assembly that all necessary preparations are made, see Chapter 5.2.

5.3.1 Assembling the butterfly valve and actuator

The PFEIFFER valves are delivered in working order. In individual cases, the actuator and butterfly 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 valve.

⚠ DANGER

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

! WARNING**Danger and damage due to use of an electrical actuator!**

- ⇒ It must be ensured that the valve in the "CLOSED" and "OPEN" position is turned off by the limit switch signal.
- ⇒ If shut-off takes place in an intermediate position due to the signal of the torque switch, this signal should be used in addition for an error message. The fault must be remedied as soon as possible, see Chapter "8 Malfunction".
- ⇒ For further instructions, see the electrical actuator documentation.

Danger of injury due to preloaded springs!

Butterfly valves that are equipped with preloaded actuator springs are under mechanical tension. The marking on the actuator type plate indicates whether a spring return is available and the fail-safe position. The marking on the type plates is described in the instruction manuals for the actuators.

- ⇒ Release the compression from the preloaded springs before working on the actuator, see the corresponding actuator documentation.

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 butterfly valve.

Danger and damage due to heavy actuator units!

Actuators that are heavier than the weight of the butterfly 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 butterfly valve due to their size and/or installation situation.

! NOTE**Damage due to incorrectly installed end stops.**

The actuator end stops must be adjusted such that the seat is not overrun, see the corresponding actuator documentation.

Damage to the butterfly valve due to the incorrect actuator assembly!

Triple eccentric butterfly valves must always be closed clockwise!

- ⇒ Observe the turning direction when assembling an actuator.

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

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

Any change to the "OPEN" and "CLOSED" end stops preset by PFEIFFER is only permissible upon consultation and approval.

5.3.2 Installing the valve in the pipe

! NOTE**Premature wear and leakage due to insufficient support or mounting!**

- ⇒ Use sufficient supports or mountings in suitable points.

- ⇒ Fasten the valve with suitable lifting equipment and pay attention to the centre of gravity of the valve, see chapter "4.3.2 Lifting the valve". Data regarding the centre of gravity can be requested from PFEIFFER.

! NOTE**Swivel and/or tipping danger**

When using manual auxiliary actuations, observe the corresponding documentation to bring the valve into the closed position.

- ⇒ Remove the protective elements on the butterfly valve prior to installation.
- ⇒ Check the closed position. Make sure that no parts of the wedge-lock-washer protrude beyond the plane-parallel sealing surfaces.
- ⇒ In the case of noise-reducing versions of the wedge-lock-washer that protrudes past the sealing surfaces, the order-related dimension sheet must be observed.
To ensure that there is a collision-free installation, suitable measures must be taken.
- ⇒ Lift the valve at the installation site using suitable lifting equipment, see Chapter 4.3.2. When doing so observe the flow direction of the butterfly valve. It is marked with direction arrows on the side of the valve body.
- ⇒ Install the butterfly valve tension-free in the pipe after previously installing supports or mountings, if necessary. It must be ensured that suitable flange seals are used, see chapter 5.2. Use bolts (no screws) and nuts to assemble the flange with blind threads on the bodies. The bolts must be screwed in to the thread base.

! WARNING**Danger of injury due to static charge**

- ⇒ If there is a risk of static charge of the butterfly valve, the operator must ensure, to avoid it, that a suitable ground connection is installed in the provided position.

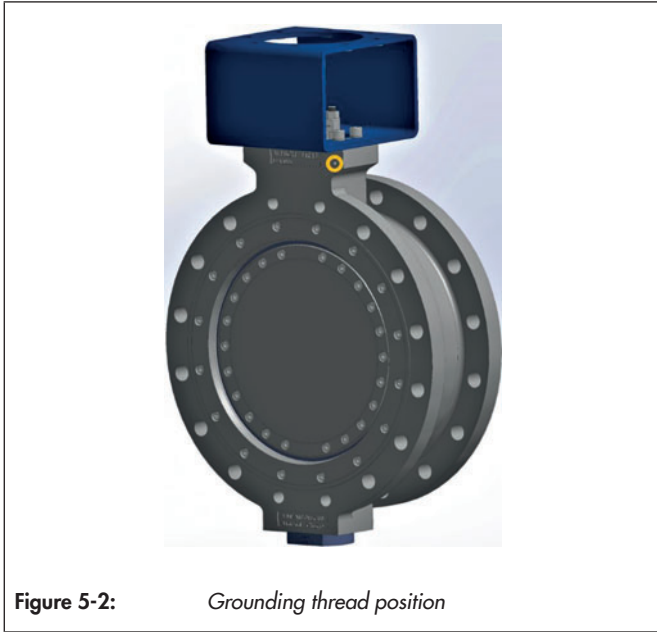


Figure 5-2: Grounding thread position

! WARNING

Danger of crushing due to moving parts!

The valve contains moving parts (e.g. shaft and wedge-lock-washer) that can lead to crushing if reaching into it.

- ⇒ During operation, do not reach into the bracket between the butterfly valve and the actuator.
- ⇒ Before working on the valve, interrupt and lock the pneumatic energy and the control signal.
- ⇒ Do not allow the jamming of objects in the bracket to hinder the rotation of the shaft.
- ⇒ In the case of a blocked shaft, contact Pfeiffer.

Danger of injury due to preloaded springs!

Butterfly valves that are equipped with preloaded actuator springs are under mechanical tension. The marking on the actuator type plate indicates whether a spring return is available and the fail-safe position. The marking on the type plates is described in the instruction manuals for the actuators.

- ⇒ Release spring force before working on the actuator, see the corresponding actuator documentation.

! NOTE

If the actuator is delivered separately from the butterfly valve or if it must be disassembled, actuator assembly may be carried out only by personnel trained by PFEIFFER.

5.4 Checking the assembled valve

! DANGER

Risk of bursting due to pressurised devices and components!

Butterfly valves and pipes are pressure equipment that can burst if handled improperly. Projecting, flying components, fragments and released pressurised medium can cause injuries or even death.

Before working on the valve:

- ⇒ Depressurise the concerned plant parts and butterfly valves, inclusive of the actuator. Also discharge the residual energy.
- ⇒ Empty the medium from the concerned plant parts and butterfly valve.

! WARNING

Danger of injury due to escaping exhaust air!

During operation, when regulating or when opening and closing the butterfly valve, exhaust air can escape, for example from the actuator.

- ⇒ Wear eye protection when working near the actuator.

Hearing damage and deafness due to a high sound level!

During operation, medium-related noise emissions may be generated depending on the plant conditions. In addition, there may be a short-term high sound pressure level when a pneumatic actuator or pneumatic attachment is suddenly ventilated without noise-reducing elements. Both can damage hearing.

- ⇒ Wear hearing protection when working in the vicinity of the valve.

Danger of injury due to pressurised components and escaping medium!

- ⇒ Do not loosen pressurised components.

Perform the following tests to test the function of the valve prior to commissioning or recommissioning:

5.4.1 Pressure and leak test

! NOTE

Damage to the butterfly valve due to a sudden pressure increase and resulting high flow speed must be avoided!

- ⇒ Observe the data on the type plate.

Damage to the butterfly valve due to excessively high or low tightening torques!

The butterfly valve components must be tightened with specific torques, see Chapter "15.1.1 Tightening torques".

Excessively tightened components are subject to increased wear. Insufficiently tightened components can cause leakage.

- ⇒ Observe the specified tightening torques.

The plant operator is responsible for performing the leak test and selecting the test procedure. The leak test must comply with the national and international standards and regulations applicable at the installation site!

During the pressure test and leak test from the outside, the butterfly valve disc must be brought into the open position.

Tip

Upon request, the After Sales Service can provide you with support for the planning and implementation of a leak test specific to your plant. Contact PFEIFFER.

The tightness of the packing, bonnet, flange and optional body extension must be checked.

In the case of impermissible leakage, proceed as follows:

Tighten the packing (8)

- ⇒ Tighten the stuffing box nuts (56) alternately and evenly using the specified torques, see Chapter "15.1.1 Tightening torques". Avoid tilting

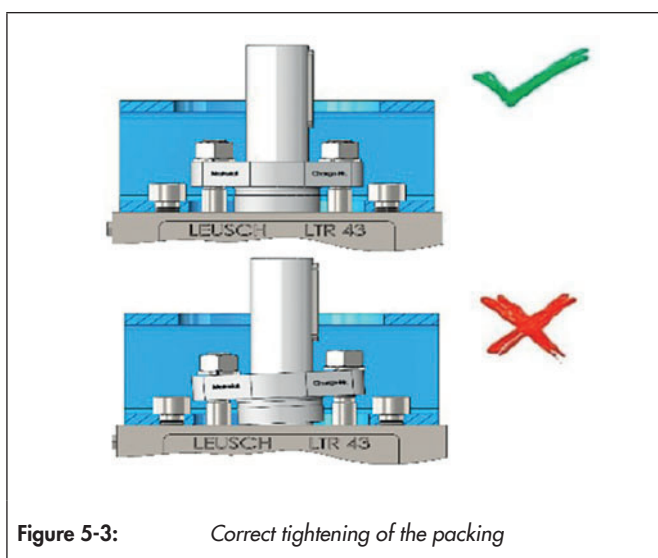


Figure 5-3: Correct tightening of the packing

- ⇒ Open and close the valve completely multiple times, if possible.
- ⇒ Repeat steps 1 and 2 until the required tightness is achieved.

NOTE**Functional impairment of the butterfly valve due to increased friction resulting from an excessively tightened stuffing box!**

- ⇒ Make sure that the actuator shaft is able to move smoothly after tightening the stuffing box.
- ⇒ If the adjustable packing is not correctly sealed, contact PFEIFFER.

Tighten the bonnet (7)

- ⇒ Tighten the bonnet screws (53) with the specified tightening torque, see Chapter "15.1.1 Tightening torques".
- ⇒ In the case of insufficient tightness, contact PFEIFFER.

Tightening the flange

- ⇒ Tighten the flange screws with the specified torque.
- ⇒ If the seal is not sufficient, the flanges and flange seals must be checked for damage and replaced if necessary.

Optional body extension (15) (insulation part)

- ⇒ Tighten the nuts (63) with the specified tightening torque, see Chapter "15.1.1 Tightening torques".
- ⇒ In the case of insufficient tightness, contact PFEIFFER.

5.4.2 Checking the rotary movement

The rotary movement of the actuator shaft must be even (smooth).

5.4.3 Checking the fail-safe position

It must be checked if the valve moves to the fail-safe position indicated on the actuator type plate, see 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!

The valve and pipe 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!

- ⇒ Pressurised components may not be loosened.

Hearing damage and deafness due to a high sound level!

During operation, medium-related noise emissions may be generated depending on the plant conditions. In addition, there may be a short-term high sound pressure level when a pneumatic actuator or pneumatic attachment is suddenly ventilated without noise-reducing elements. Both can damage hearing.

- ⇒ Wear hearing protection when working in the vicinity of the valve.

Danger of crushing due to moving parts

The valve contains moving parts (e.g. shaft and wedge-lock-washer) that can lead to crushing if reaching into it.

- ⇒ During operation, do not reach into the bracket between the butterfly valve and the actuator.
- ⇒ Before working on the valve, interrupt and lock the pneumatic energy and the control signal.
- ⇒ Do not allow the jamming of objects in the bracket to hinder the rotation of the shaft.
- ⇒ In the case of a blocked shaft, contact PFEIFFER.

Danger of injury due to escaping exhaust air!

During operation, when regulating or when opening and closing the butterfly valve, exhaust air can escape, for example from the actuator.

- ⇒ Wear eye protection when working in the vicinity of the actuator.

- ⇒ the limit values indicated on the type plate, such as the max. permissible pressure PS of the valve, minimum/maximum temperature TS, see Chapter "2 Markings on the device", are not exceeded due to the operating conditions ($P < PS$, $TS_{min.} < T < TS_{max.}$).

Furthermore, the pressure-temperature assignment must be observed according to EN 12516-1, EN 1092-1 and ASME B16.34.

The valve must be operated by expert and instructed personnel. Furthermore, the operator must ensure that employees and third parties are not endangered. The nationally applicable regulations of the country of destination must be observed when operating the valve.

Changes to the factory settings for the actuator (e.g. end stops) and accessories (e.g. filter regulator, booster, controller etc.) are not permissible and may be made on an individual basis only upon approval of the manufacturer by qualified and expert personnel.

The system must be started-up and shut-down so that the temperature increase/decrease or sudden pressure increases do not result in impermissible increases in voltage.

During start-up operation, the valve must be continuously observed and checked for possible leakage.

During normal operation, the valve may only be operated if all valve components are functional and not deactivated or changed with regard to its intended effect.

Operation of the valve in a continuous throttle position (no opening angle) can lead to increased wear of the sealing elements (seat/seal ring) and require more frequent maintenance intervals.

Commissioning/recommissioning

The valve may only be commissioned after the operator has ensured that

- ⇒ the valve has been inspected to ensure its proper condition in relation to installation and safe function, see Chapter "5 Installation".
- ⇒ the parts in contact with the media are suitable for the intended use, see chapter "1 Safety instructions and safety measures".
- ⇒ The actuators and accessories (if installed) are connected according to manufacturer instructions and the valve functions correctly according to the control commands.
- ⇒ for electrical components, the IP and Ex markings/data are correct.

7 Operation

As soon as the commissioning/recommissioning work is complete without any defects, see Chapter "6 Start-up", the valve is ready for operation.

! DANGER

Danger due to jerky operation of the valve!

The failure to observe these warnings can cause extreme danger for persons or damage to the pipe system.

- ⇒ Do not open and close the butterfly valve suddenly to prevent pressure surges and/or a temperature shock in the pipe system.

! WARNING

Danger of burning due to hot or cold components and pipe!

Butterfly valves 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!

- ⇒ Pressurised components may not be loosened.

Hearing damage and deafness due to a high sound level!

During operation, medium-related noise emissions may be generated depending on the plant conditions. In addition, there may be a short-term high sound pressure level when a pneumatic actuator or pneumatic attachment is suddenly ventilated without noise-reducing elements. Both can damage hearing.

- ⇒ Wear hearing protection when working in the vicinity of the actuator.

Danger of crushing due to moving parts

The valve contains moving parts (e.g. shaft and wedge-lock-washer) that can lead to crushing if reaching into it.

- ⇒ During operation, do not reach into the bracket between the butterfly valve and the actuator.
- ⇒ Before working on the valve, interrupt and lock the pneumatic energy and the control signal.
- ⇒ Do not allow the jamming of objects in the bracket to hinder the rotation of the shaft.
- ⇒ In the case of a blocked shaft, contact PFEIFFER.

Danger of injury due to escaping exhaust air!

During operation, when regulating or when opening and closing the butterfly valve, exhaust air can escape, for example from the actuator.

- ⇒ Wear eye protection when working in the vicinity of the actuator.

After commissioning and reaching the operating temperature, it may be necessary to retighten the screw connections on the body parts with the corresponding tightening torques, see Chapter "15.1.1 Tightening torques".

If an valve leaks, see chapter "8 Malfunction".

7.1 Working in automatic mode

For actuators with additional manual adjustment, bring them into a neutral position recommended by the manufacturer. Further information can be found in the respective component instructions.

Butterfly valves that were delivered from the factory with an actuator are precisely adjusted. The user is responsible for any changes they make.

7.2 Working in manual mode

For actuators with manual adjustment, the butterfly valve can be opened and closed manually if the pneumatic energy fails. Further information can be found in the respective component instructions.

7.3 Working with the manual gear

For butterfly valves with manual adjustment, they can be opened and closed manually. Further information can be found in the respective component instructions.

8 Malfunction

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

8.1 Detecting and rectifying errors

| Type of fault | Cause | Measure | Note |
|---------------------------------------|--|--|--|
| Leaks in the passage | Wedge-lock-washer not in the closed position | Check the end stops on the actuator and/or gear (sealing paint undamaged) Contact PFEIFFER for further measures | Note 1: Check the position marking on the shaft, see Chapter 3. Note 2: Check the position display on the actuator Note 3: Rinse the butterfly valve and pipes |
| | Seat/seal ring damaged | Replace the seat/seal ring | Contact PFEIFFER with regard to a repair kit |
| Leaks in the flange seal | Seal damaged | Replace the seal | Use a suitable seal, see Chapter 4.4 |
| | Insufficient surface pressure on the seal | Tighten the flange screws | Observe the maximum permissible tightening torques |
| | Flange sealing surface damaged | Rework the flange sealing surface | Coordinate rework with PFEIFFER |
| Leaks in the shaft sealing (packing) | Packing worn | Tighten the stuffing box nuts | Observe the max. permissible tightening torques, see Chapter 15.2 |
| | Packing insufficiently preloaded | Tighten the stuffing box nuts | Observe the max. permissible tightening torques, see Chapter 15.2 |
| | Packing defective | Replace the packing | See chapter 9.3.3 |
| Leaks in the body cover | Seal insufficiently preloaded | Retighten the bonnet screws. | Observe the max. permissible tightening torques, see Chapter 15.2 |
| | Seal defective | Replace the seal. | See chapter 9.3.3 |
| Difficulty of actuator shaft movement | Packing improperly preloaded | Release and and realign the gland | Depressurise the butterfly valve, see Chapter 10 |
| | Insufficient tightening torque | Check the pneumatic energy. | |
| | Actuator insufficiently supported | Use construction measures to support the weight of the actuator | |
| | Dirt in the bearing area | Contact PFEIFFER | |
| Actuator functionality limited | Actuator or control faulty | Contact PFEIFFER. | |

In the case of faults that are not listed in the table, contact the After Sales Service at PFEIFFER.

8.2 Carrying out emergency measures

The system operator is responsible for emergency measures. In the case of an valve fault, observe the measures in Chapter 8.1.

In case of an valve fault:

- ⇒ Close off the pipe upstream and downstream of the actuator so that no medium flows through the valve.
- ⇒ Troubleshoot the error, see chapter 8.1.
- ⇒ Rectify the fault that can be fixed as indicated in the instructions provided in this installation and operating manual.
Contact PFEIFFER for additional errors.

Recommissioning after faults

See chapter 6

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 valve:

- Instructions for actuators and attachments

DANGER

Risk of bursting due to pressurised devices and components!

Butterfly valves and pipes are pressure equipment that can burst if handled improperly. Projecting, flying components, fragments and released pressurised medium can cause injuries or even death.

Before working on the valve:

- ⇒ Depressurise the concerned plant parts and actuators. Also discharge the residual energy.
- ⇒ Empty the medium from the concerned plant parts and butterfly valve.

WARNING

Danger of burning due to hot or cold components and pipe!

The valve and pipe 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!

- ⇒ Pressurised components may not be loosened.

Hearing damage and deafness due to a high sound level!

During operation, medium-related noise emissions may be generated depending on the plant conditions. In addition, there may be a short-term high sound pressure level when a pneumatic actuator or pneumatic attachment is suddenly ventilated without noise-reducing elements. Both can damage hearing.

- ⇒ Wear hearing protection when working in the vicinity of the actuator.

Danger of crushing due to moving parts

The valve contains moving parts (e.g. shaft and disc) that can lead to crushing if reaching into it.

- ⇒ During operation, do not reach into the bracket between the butterfly valve and the actuator.
- ⇒ Before working on the valve, interrupt and lock the pneumatic energy and the control signal.
- ⇒ Do not allow the jamming of objects in the bracket to hinder the rotation of the shaft.
- ⇒ In the case of a blocked shaft, contact PFEIFFER.

WARNING

Danger of injury due to escaping exhaust air!

During operation, when regulating or when opening and closing the butterfly valve, exhaust air can escape, for example from the actuator.

- ⇒ Wear eye protection when working in the vicinity of the actuator.

Danger of injury due to preloaded springs!

Valves that are equipped with preloaded actuator springs are under mechanical tension. The marking on the actuator type plate indicates whether spring return is available and the fail-safe position. The marking on the type plates is described in the instruction manuals for the actuators.

- ⇒ Release the compression from the preloaded springs before working on the actuator, see the corresponding actuator documentation.

Danger of injury due to residual medium in the butterfly valve!

When working on the butterfly valve, residual medium can escape and, depending on the medium properties, cause injuries (e.g. scalding, chemical burns).

- ⇒ If possible, empty the medium from the concerned plant parts and butterfly valve.
- ⇒ Wear protective garments, protective gloves and eye protection.

Damage to the butterfly valve due to unsuitable lubricants!

The functionality of the butterfly valve is ensured only by using a certain lubricant. Unsuitable lubricants can corrode and damage the surface.

- ⇒ Only use lubricants recommended by PFEIFFER, see Chapter "15.1.2 Lubricants".

NOTE

Damage to the butterfly valve due to the subsequent fitting of the actuator!

- ⇒ If the actuator is delivered separately from the butterfly valve or if it must be disassembled, observe the corresponding assembly instructions.

Damage to the butterfly valve due to excessively high or low tightening torques!

The butterfly valve components must be tightened with specific torques, see Chapter "15.1.1 Tightening torques". Excessively tightened components are subject to increased wear. Insufficiently tightened components can cause leakage.

- ⇒ Observe the tightening torques.

Info

The valve was checked by PFEIFFER prior to delivery.

- Certain test results certified by PFEIFFER are no longer valid when performing maintenance work on the 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.
- For spare parts, only use original parts from PFEIFFER that correspond to the original specification.

9.1 Periodic tests

Depending on the conditions of use, the 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 in consideration of the documentation of the utilised components.



Tip
After Sales Service can provide you with support for creating a test plan specific to your plant. Contact PFEIFFER.

PFEIFFER recommends the following inspections that can be carried out during operation:

| Test | Measures in the case of a negative test result |
|---|---|
| Check the butterfly valve for exterior damage (e.g. corrosion). | Remedy any damage immediately, if possible. If required, decommission the valve, see chapter 10. |
| Check the imprints and impressions on the valve, adhesives and signs for legibility and completeness. | Request a replacement for damaged, missing or faulty signs or adhesives and replace them. Clean text that is illegible due to dirt. |
| Check the butterfly valve for leaks from the outside. | Tighten the packing, see Chapter 5.1.1. Tighten the screw connections on the bonnet and extension, see Chapter 5.1.1 or replace the corresponding seals. Check the flange connection (tightening torques) and replace the seals on the flange connection if necessary, see Chapter 9.4. |
| Check the actuator, attachments and their piping for leaks. | Proper tightening of the pipe connections. In the case of defective components, contact PFEIFFER. |
| Check the inner tightness of the butterfly valve. | Rinse the plant part with the butterfly valve open, to remove any dirt and/or deposited foreign material from between the seat and the seal ring. Check the end position to the closed position and adjust if necessary. Replace the seat and seal ring, see Chapter 9.3.4 |

| Test | Measures in the case of a negative test result |
|---|--|
| Check the rotary movement of the actuator for a smooth, rotating movement. | Check the packing for correct tightening torque and tighten correctly if necessary, see Chapter 5.1.1. |
| | Check the functionality/energy supply of the actuator and the attachments and take suitable measures if necessary. |
| | If the actuator shaft is blocked, contact PFEIFFER immediately through. |
| | Decommission the valve, see chapter 10. Then determine the cause and remedy it, see Chapter 8.1. |
| If required, check the fail-safe position of the valve (partial stroke/full stroke test). | Contact PFEIFFER. |

9.2 Preparing maintenance work

- ⇒ Get the material and tools ready that are required for the maintenance work.
- ⇒ Identify the components that should be checked or serviced.
- ⇒ If components are to be replaced, it is recommended to contact PFEIFFER.
- ⇒ Decommission the valve, see chapter “10 Decommissioning”.
- ⇒ Interrupt the pneumatic energy to the valve (deenergise and depressurise).

9.3 Maintenance work

9.3.1 Maintenance work on the attachments

Observe the documentation for the corresponding attachments.

9.3.2 Maintenance work on the actuator

Observe the documentation for the corresponding actuator.

9.3.3 Maintenance work on the butterfly valve in an installed condition

At least one PFEIFFER Seal Kit is required to perform this work.

PFEIFFER recommends the procurement of a corresponding repair kit, see Chapter “1.5.3 Spare parts”.

9.3.3.1 Replacing the packing

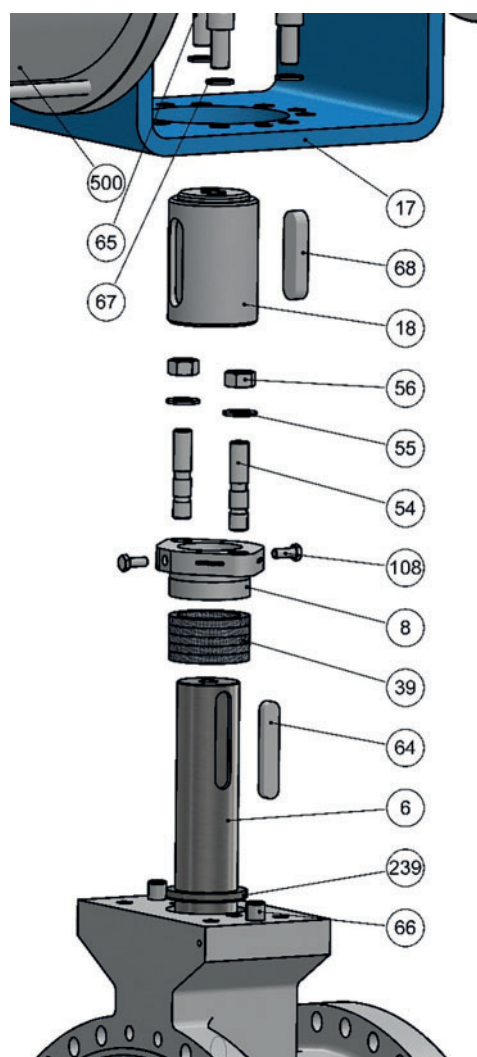


Figure 9-1: Packing replacement

Table 9-1: Parts list

| Pos. | Designation |
|------|---------------|
| 6 | Shaft |
| 8 | Gland |
| 17 | Bracket |
| 18 | Coupling |
| 39 | Packing |
| 54 | Stud bolt |
| 55 | Washer |
| 56 | Nut |
| 59 | Spring washer |

| Pos. | Designation |
|------|-------------------|
| 64 | Key |
| 65 | Screw |
| 66 | Pin |
| 67 | Wedge-lock-washer |
| 68 | Key |
| 108 | Screw |
| 239 | Support ring |
| 500 | Actuator |

- ⇒ Secure the actuator (500) with a crane, see the corresponding actuator documentation.
- ⇒ Mark the installation position of the actuator.
- ⇒ Release only the screws (65) and wedge-lock-washers (67) between the bracket (17) and the butterfly valve.
- ⇒ Lift the actuator with the crane and put it down in a safe place.
- ⇒ Disassemble the coupling (18) and secure the key(s) (68) in it to prevent it from falling out.
- ⇒ Remove the key(s) (64).
- ⇒ Remove the nuts (56) and wedge-lock-washers (55) or spring washers (59). When reassembling the spring washer set, observe the correct sequence and alignment.
- ⇒ Release the screws (108) until the stuffing box can be pulled off.
- ⇒ Disassemble the gland (8) and remove the packing ring (39) carefully with a suitable tool. (The support ring (239) remains in the body.)
- ⇒ Remove any residues in the packing area and clean it.
- ⇒ Apply a thin layer of approved lubricant in the packing area, see Chapter "15.1.2 Lubricants"

WARNING

Damage to the butterfly valve due to unsuitable lubricants!
 The functionality of the butterfly valve is ensured only by using a certain lubricant. Unsuitable lubricants can corrode and damage the surface.
 ⇒ Only use lubricants recommended by PFEIFFER, see Chapter "15.1.2 Lubricants".

- ⇒ In the case of increased requirements on the outer tightness (TA-Luft), see Chapter "15.1.1 Tightening torques".
- ⇒ Insert the new packing rings (39) one after the other. If available, it must be ensured that the trimmed edges are offset with respect to each other.
- ⇒ Assemble the gland (8), nuts (56) and wedge-lock-washers (55) or spring washers (59).

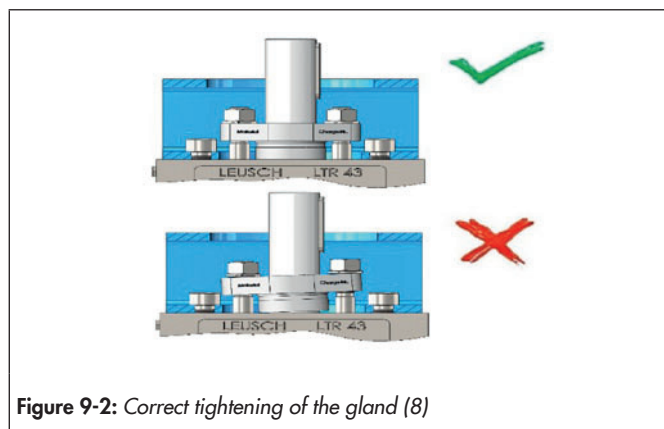


Figure 9-2: Correct tightening of the gland (8)

- ⇒ Tighten the nuts (56) alternately with slight manual force. Make sure that the stuffing box does not tilt with respect to the shaft.
- ⇒ Assemble the key(s) (68).
- ⇒ Tighten the nuts (56) in a criss-cross pattern with the specified torques, see Chapter 15.1.1.
- ⇒ Assemble the actuator in the marked installation position.
- ⇒ Check the tightness of the packing (39) and the functionality of the valve, see chapter "5.4 Checking the assembled valve". If the packing leaks, tighten the nuts (56) in a criss-cross pattern in small steps. If there is still leakage, contact PFEIFFER.

9.3.3.2 Replacing the gasket cover

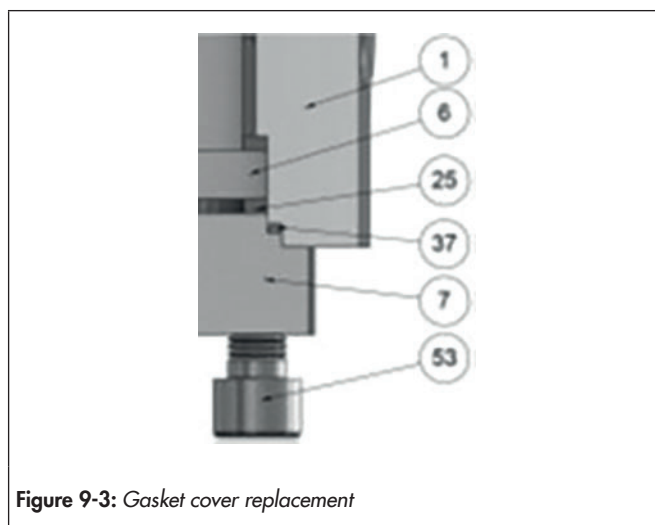


Figure 9-3: Gasket cover replacement

Table 9-2: Parts list

| Pos. | Designation |
|------|--------------|
| 1 | Body |
| 6 | Shaft |
| 7 | Bonnet |
| 25 | Thrust ring |
| 37 | End cap seal |
| 53 | Screw |

- ⇒ Release and remove the screws (53), see Figure 9 3.
- ⇒ Disassemble the bonnet (7) and remove the old cover sealing (37). During disassembly, make sure that the thrust ring (25) does not fall out.
- ⇒ Remove the residues and check for damage.
- ⇒ Apply a thin layer of approved lubricant on the new gasket cover (37) and thrust ring (25) and position them on the bonnet (7) and install.
- ⇒ First tighten the screws (53) cross-wise with slight manual force. Then tighten with the specified tightening torque, see Chapter "15.1.1 Tightening torques".

⇒ Check the butterfly valve for any leaks in this area prior to commissioning. If there is still leakage, contact PFEIFFER.

9.3.4 Maintenance work on the butterfly valve in a removed condition

Observe Chapter 11 for valve disassembly.

PFEIFFER recommends a rep-kit for the performance of this work, see Chapter “15.3 Spare parts”.

Replacing the seat and seal ring

The series differ in the design of the sealing system, see Chapter 9.6.

The procedure for replacing the seat and seal ring is described in separate documentation, see the “Applicable documents” in Chapter 1.

9.4 Assembling and commissioning the valve after maintenance work

The assembly and commissioning of the valve takes place according to the specifications in Chapter “5 Installation” and “6 Start-up”.

9.5 Design of the sealing system

The following figures describe the constructive design of the sealing system of the BR 14t - LTR 43 butterfly valve series.

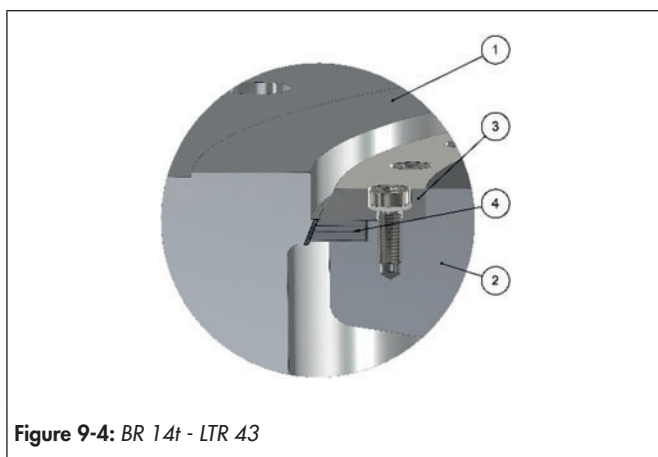


Table 9-3: Parts list for BR 14t - LTR 43

| Pos. | Designation |
|------|---------------|
| 1 | Body |
| 2 | Disc |
| 3 | Clamping ring |
| 4 | Seal ring |

10 Decommissioning

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

DANGER

Risk of bursting due to pressurised devices and components!

Butterfly valves and pipes are pressure equipment that can burst if handled improperly. Projecting, flying components, fragments and released pressurised medium can cause injuries or even death.

Before working on the valve:

- ⇒ Depressurise the concerned plant parts and valve. Also discharge the residual energy.
- ⇒ Empty the medium from the concerned plant parts and butterfly valve.

WARNING

Danger of burning due to hot or cold components and pipe!

The valve and pipe 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!

- ⇒ Pressurised components may not be loosened.

Hearing damage and deafness due to a high sound level!

During operation, medium-related noise emissions may be generated depending on the plant conditions. In addition, there may be a short-term high sound pressure level when a pneumatic actuator or pneumatic attachment is suddenly ventilated without noise-reducing elements. Both can damage hearing.

- ⇒ Wear hearing protection when working in the vicinity of the actuator.

Danger of crushing due to moving parts!

The valve contains moving parts (e.g. shaft and disc) that can lead to crushing if reaching into it.

- ⇒ During operation, do not reach into the bracket between the butterfly valve and the actuator.
- ⇒ Before working on the valve, interrupt and lock the pneumatic energy and the control signal.
- ⇒ Do not allow the jamming of objects in the bracket to hinder the rotation of the shaft.
- ⇒ If the shaft is blocked, contact PFEIFFER.

Danger of injury due to escaping exhaust air!

During operation, when regulating or when opening and closing the butterfly valve, exhaust air can escape, for example from the actuator.

- ⇒ Wear eye protection when working in the vicinity of the actuator.

WARNING

Danger of injury due to residual medium in the butterfly valve!

When working on the butterfly valve, residual medium can escape and, depending on the medium properties, cause injuries (e.g. scalding, chemical burns).

- ⇒ If possible, empty the medium from the concerned plant parts and butterfly valve.
- ⇒ Wear protective garments, protective gloves and eye protection.

Danger of injury due to preloaded springs!

Actuators that are equipped with preloaded actuator springs are under mechanical tension. The marking on the actuator type plate indicates whether a spring return is available and the fail-safe position. The marking on the type plates is described in the instruction manuals for the actuators.

- ⇒ Release the compression from the preloaded springs before working on the actuator, see the corresponding actuator documentation.

NOTE

If the actuator is delivered separately from the butterfly valve or if it must be disassembled, the corresponding assembly instructions must be observed.

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

- ⇒ Depressurise the pipes and butterfly valves and remove residual medium from the pipe.
- ⇒ Shut off the pneumatic energy and lock it, to deenergise and depressurise the actuator.
- ⇒ Let the pipe and butterfly 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. The After Sales Service of PFEIFFER is glad to provide on-site consultation and support.

WARNING

Danger of burning due to hot or cold components and pipe!

The valve and pipe 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 parts

- ⇒ Before working on the valve, interrupt and lock the pneumatic energy and the control signal and release the spring tension in the actuator if necessary.
- ⇒ Do not allow the jamming of objects in the bracket to hinder the rotation of the shaft.
- ⇒ If the shaft is blocked, contact PFEIFFER.

Danger of injury due to residual medium in the butterfly valve!

When working on the butterfly valve, residual medium can escape and, depending on the medium properties, cause injuries (e.g. scalding, chemical burns).

- ⇒ Empty the medium from the concerned plant parts and butterfly valve.
- ⇒ Wear protective garments, protective gloves and eye protection.

Danger of injury due to preloaded springs!

Actuators that are equipped with preloaded actuator springs are under mechanical tension. The marking on the actuator type plate indicates whether a spring return is available and the fail-safe position. The marking on the type plates is described in the instruction manuals for the actuators.

- ⇒ Release the compression from the preloaded springs before working on the actuator, see the corresponding actuator documentation.

NOTE

If the actuator is delivered separately from the butterfly valve or if it must be disassembled, the corresponding assembly instructions must be observed.

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

- ⇒ The valve is decommissioned, see chapter 10.
- ⇒ When using manual auxiliary actuations, observe the corresponding documentation to bring the valve into the closed position.
- ⇒ Check the closed position.

- ⇒ To ensure collision-free removal, suitable measures must be taken, see Chapter 5.3.2. In the case of noise-reducing versions of the wedge-lock-washer that also protrude past the overall length, the order-related dimension sheet must be observed.

11.1 Removing the butterfly valve with an assembled actuator from the pipe

- ⇒ Fasten the valve with suitable lifting equipment and pay attention to the centre of gravity of the valve, see chapter "4.3 Transporting and lifting the valve".

NOTE

Swivel and/or tipping danger

- ⇒ If necessary, release and remove the supports or mountings.
- ⇒ Loosen the flange connection properly.
- ⇒ Disassemble the screws and seals and store them appropriately.
- ⇒ Lift the valve carefully out of the installation site using suitable lifting equipment, see Chapter "4.3.2 Lifting the valve".
- ⇒ Check the closed position.
- ⇒ Place the valve in a safe position on suitable ground and secure it to prevent it from tipping.

DANGER

Danger of injury due to a spring-loaded opening actuator

The uncontrolled swinging movement of the wedge-lock-washer can be dangerous.

- ⇒ Do not stay in danger zone.

- ⇒ Mark or document the installation position of the actuator.
- ⇒ For the transport and storage of the valve, observe Chapter "4 Shipment and on-site transport".

11.2 Disassembling the actuator

- ⇒ Secure the actuator with the crane.
- ⇒ Mark or document the installation position of the actuator.
- ⇒ Only the screws (65) between the bracket and butterfly valve may be loosened.
- ⇒ Lift the actuator with the crane and put it down in a safe place.

12 Repairs

If the 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 valve due to improper repairs!

- ⇒ Only have repair work performed by qualified and trained personnel.
- ⇒ If required, PFEIFFER can be contacted.

12.1 Sending devices to PFEIFFER

Defective butterfly valves can be sent to PFEIFFER for repair.

When returning devices to PFEIFFER, proceed as follows:

- ⇒ Decommission the valve, see chapter 10, and disassemble it, see Chapter 11.
- ⇒ Decontaminate the butterfly valve. Remove residual medium completely.

WARNING

Danger due to a contaminated 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".

- ⇒ Fill out the declaration regarding contamination.

Info

Further information about sending in devices or regarding returns can be found at <https://www.samsongroup.com/de/service-support/after-sales-service/retouren/>.

⇒ Include the following information for returns:

- Manufacturer number
- Valve type
- Article number
- Nominal size and version of the valve
- Manual valve/automated valve
- Medium (designation and consistency)
- Medium pressure and temperature
- Flow rate in m³/h
- Bench range of the actuator (e.g. 0.2 to 1 bar)
- 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, see page 14-2.
- Declaration of conformity for completed machinery according to Machinery Directive 2006/42/EC for butterfly valve BR 14t - LTR 43, see page 14-3.
- Declaration of installation for partly completed machinery according to Machinery Directive 2006/42/EC for butterfly valve BR 14t - LTR 43, see page 14-4

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 | LEUSCH GmbH Industrial Valves , 41472 Neuss, Germany |
| declares for the listed products: | Type 14t - LTR 43 Butterfly valves (BR 14t - LTR 43) with packing and adjustable stuffing box <ul style="list-style-type: none"> • with pneumatic/ electric/ hydraulic actuator • with free shaft end for subsequent mounting of an actuator • with gearbox and handwheel |
| <p>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.</p> <p>2. They may only be operated observing the Installation and operating instructions ► EB 14t.</p> <p>Commissioning of the units is only permitted when the valve is connected to both sides of the pipeline and a risk of injury is thus excluded.</p> <p>(See ► EB 14t, Chapter 1 for butterfly valves intended for dead-end service)</p> | |

Applied standards:

| | |
|-----------------|--|
| EN 16668 | Industrial valves – Requirements and testing for metallic valves as pressure accessories |
| EN 1349 | Industrial process control valves |

Type designation and technical features:

| |
|--|
| PFEIFFER Data sheets ► TB 14t NOTE: This declaration applies to all valve types listed in the data sheet. |
|--|

Applied conformity assessment procedure:

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

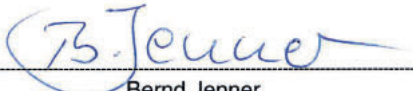
Name of notified body:

Identification number of the notified body:

| | |
|---|------|
| TÜV Rheinland Service GmbH Am Grauen Stein 51101 Köln Germany | 0035 |
|---|------|

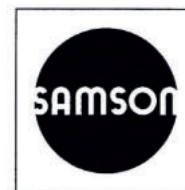
Modifications to valves which have an effect on the technical data of the valve or on the intended use (see ► EB 14t, section 1) and which substantially change the valve make this declaration invalid.

Kempen, 31. May 2023


 Bernd Jenner
 Chief Executive Officer

EU DECLARATION OF CONFORMITY

TRANSLATION



| | |
|--|--|
| The manufacturer | LEUSCH Industrial Valves, 41472 Neuss, Germany |
| declares for the listed products that: | <p>Type 14t - LTR 43 Control and shut-off butterfly valve (BR 14t - LTR 43)</p> <ul style="list-style-type: none"> • with a Type 31a Quarter-turn Actuator (BR 31a) • with a rotary actuator of a different make <p>Prerequisite: the unit was designed and assembled by LEUSCH GmbH. The serial number on the valve refers to the entire unit.</p> |
| <p>1. They comply with all applicable requirements stipulated in Machinery Directive 2006/42/EC.</p> <p>2. In the delivery state, the valve with actuator is considered to be completed machine as defined in the above mentioned directive.</p> <p>Commissioning of these unit is only permitted when the valve is connected to both sides of the pipeline and a risk of injury is thus excluded.</p> | |

Referenced standards:

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

Product description and technical features:

Butterfly valve for liquid or gaseous media, particularly for high requirements in oil-, gas- or chemical applications, automated with a single or double-acting piston actuator for rotating trims.

For product descriptions refer to:

PFEIFFER data sheet for Type 14t - LTR 43 Valve ▶ TB 14t

PFEIFFER data sheet for Type 31a Actuator ▶ TB 31a

Date sheet for different rotary actuators

PFEIFFER mounting and operating instructions for Type 14t - LTR 43 Valve ▶ EB 14t

PFEIFFER mounting and operating instructions for Type 31a Actuator ▶ EB 31a

Mounting and operating instructions for different rotary actuators

PFEIFFER safety manual for Type 14t - LTR 43 Valve ▶ SH 14t

PFEIFFER safety manual for Type 31a Actuator ▶ SH 31a

Safety manual for different rotary actuators

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 above mentioned guide to the Machinery Directive.

Modifications to valves which have an effect on the technical data of the valve or on the intended use (see ▶ EB 14t, section 1) and which substantially change the valve make this declaration invalid.

Kempen, 31 May 2023


 Bernd Jenner
 Chief Executive Officer

EU DECLARATION OF CONFORMITY TRANSLATION



| | |
|--|--|
| The manufacturer | LEUSCH Industrial Valves , 41472 Neuss, Germany |
| declares for the listed products that: | Type 14t - LTR 43 Control and shut-off butterfly valve (BR 14t - LTR 43) <ul style="list-style-type: none"> • with free shaft end (without actuator) • not intended for a defined actuated system |
| <p>1. In the delivered state, i.e. prepared for the assembly of a quarter-turn actuator (not clearly defined actuator system) are considered "partly completed machinery" in the sense of the Machinery Directive 2006/42/EC.</p> <p>Machines are to be considered as partly completed machines if the manufacturer has not defined all necessary specifications including type, connectors, forces, torques etc.</p> <p>Commissioning of these units is only permitted when the valve is connected to both sides of the pipeline and a risk of injury is thus excluded.</p> | |

Referenced standards:

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

Product description and technical features:

Butterfly valve for liquid or gaseous media, particularly for high requirements in oil-, gas- or chemical applications.

For product descriptions refer to:
 PFEIFFER data sheet for Type 14t - LTR 43 Valve ▶ TB 14t
 PFEIFFER mounting and operating instructions for Type 14t - LTR 43 Valve ▶ EB 14t

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 above mentioned guide to the Machinery Directive.

Modifications to valves which have an effect on the technical data of the valve or on the intended use (see ▶ EB 14t, section 1) and which substantially change the valve make this declaration invalid.

Kempen, 31 May 2023


 Bernd Jenner
 Chief Executive Officer

4 Annex

15.1 Tightening torques, lubricant and tools

15.1.1 Tightening torques

15.1.1.1 Bonnet, seat, seat ring, retaining ring, shaft, extension and bracket

Table 15-1: The tightening torques apply for materials A2-70, 1.4980, Monel K500 and 1.4462

| Thread size | Max. torque [Nm] for screws according to DIN 7984 (low head), see Figure 1 | Max. torque [Nm] for screws according to ISO 4762 (high head), see Figure 2 |
|-------------|--|---|
| M6 | 7.3 | 9.1 |
| M8 | 17.5 | 21.8 |
| M10 | 35 | 44 |
| M12 | 60 | 75 |
| M16 | 144 | 180 |
| M20 | 296 | 370 |
| M24 | 486 | 608 |
| M27 | 336 | 421 |
| M30 | 457 | 571 |
| M33 | 623 | 779 |

The values in the table apply for lubricated threads.



Figure 15-1: Screw according to DIN 7984



Figure 15-2: Screw according to ISO 4762

15.1.1.2 Stuffing box nuts (standard)

Values in the following table according to technical data sheet
▶ LW-10006

Table 15-2: PN 10 / 16 / 25 and cl150 (max. 28 bar)

| Nominal size | | Stuffing box | Ø shaft | Graphite packing $M_{min.}$ [Nm] | PTFE packing $M_{min.}$ [Nm] | Max. permissible $M_{max.}$ [Nm] |
|--------------|------|--------------|---------|-------------------------------------|---------------------------------|-------------------------------------|
| NPS | DN | | | | | |
| 3 | 80 | M10 | 20 | 6 | 8 | 35 |
| 4 | 100 | M10 | 20 | 6 | 8 | 35 |
| 6 | 150 | M12 | 25 | 14 | 18 | 60 |
| 8 | 200 | M12 | 25 | 14 | 18 | 60 |
| 10 | 250 | M12 | 30 | 16 | 20 | 60 |
| 12 | 300 | M12 | 35 | 18 | 23 | 60 |
| 14 | 350 | M16 | 40 | 27 | 34 | 144 |
| 16 | 400 | M16 | 50 | 33 | 41 | 144 |
| 18 | 450 | M16 | 50 | 33 | 41 | 144 |
| 20 | 500 | M20 | 60 | 48 | 60 | 296 |
| 24 | 600 | M20 | 70 | 75 | 94 | 296 |
| 28 | 700 | M20 | 70 | 75 | 94 | 296 |
| 30 | 750 | M20 | 70 | 75 | 94 | 296 |
| 32 | 800 | M20 | 80 | 85 | 106 | 296 |
| 36 | 900 | M20 | 80 | 85 | 106 | 296 |
| 40 | 1000 | M24 | 100 | 125 | 156 | 486 |

Table 15-3: PN 40 and cl300 (max. 55 bar)

| Nominal size | | Stuffing box | Ø shaft | Graphite packing $M_{min.}$ [Nm] | PTFE packing $M_{min.}$ [Nm] | Max. permissible $M_{max.}$ [Nm] |
|--------------|------|--------------|---------|-------------------------------------|---------------------------------|-------------------------------------|
| NPS | DN | | | | | |
| 3 | 80 | M10 | 20 | 6 | 8 | 35 |
| 4 | 100 | M12 | 25 | 14 | 18 | 60 |
| 6 | 150 | M12 | 30 | 16 | 20 | 60 |
| 8 | 200 | M12 | 35 | 18 | 23 | 60 |
| 10 | 250 | M16 | 40 | 27 | 34 | 144 |
| 12 | 300 | M16 | 50 | 33 | 41 | 144 |
| 14 | 350 | M20 | 60 | 48 | 60 | 296 |
| 16 | 400 | M20 | 70 | 75 | 94 | 296 |
| 18 | 450 | M20 | 70 | 75 | 94 | 296 |
| 20 | 500 | M20 | 80 | 85 | 106 | 296 |
| 24 | 600 | M24 | 100 | 125 | 156 | 486 |
| 28 | 700 | M33 | 110 | Upon request | | |
| 30 | 750 | M24 | 120 | | | |
| 32 | 800 | M30 | 130 | | | |
| 36 | 900 | M30 | 130 | | | |
| 40 | 1000 | M30 | 130 | | | |

Table 15-4: PN 63 (cl400) (max. 70 bar)

| Nominal size | | Stuffing box | Ø shaft | Graphite packing M _{min.} [Nm] | PTFE packing M _{min.} [Nm] | Max. permissible M _{max.} [Nm] |
|--------------|------|--------------|---------|--|--|--|
| NPS | DN | | | | | |
| 3 | 80 | M12 | 25 | 14 | 18 | 60 |
| 4 | 100 | M16 | 30 | 21 | 27 | 144 |
| 6 | 150 | M16 | 35 | 24 | 30 | 144 |
| 8 | 200 | M20 | 40 | 34 | 42 | 296 |
| 10 | 250 | M16 | 50 | 33 | 41 | 144 |
| 12 | 300 | M20 | 60 | 48 | 60 | 296 |
| 14 | 350 | M20 | 70 | 75 | 94 | 296 |
| 16 | 400 | M27 | 80 | 115 | 143 | 336 |
| 18 | 450 | M27 | 80 | 115 | 143 | 336 |
| 20 | 500 | M30 | 100 | 156 | 195 | 432 |
| 24 | 600 | M24 | 120 | Upon request | | |
| 28 | 700 | M30 | 130 | | | |
| 30 | 750 | | | | | |
| 32 | 800 | | | | | |
| 36 | 900 | | | | | |
| 40 | 1000 | | | | | |

Table 15-5: PN 100 and cl600 (max. 110 bar)

| Nominal size | | Stuffing box | Ø shaft | Graphite packing M _{min.} [Nm] | PTFE packing M _{min.} [Nm] | Max. permissible M _{max.} [Nm] |
|--------------|------|--------------|---------|--|--|--|
| NPS | DN | | | | | |
| 3 | 80 | M12 | 25 | 21 | 26 | 60 |
| 4 | 100 | M16 | 30 | 31 | 39 | 144 |
| 6 | 150 | M16 | 35 | 35 | 44 | 144 |
| 8 | 200 | M20 | 40 | 49 | 62 | 296 |
| 10 | 250 | M16 | 50 | 48 | 60 | 144 |
| 12 | 300 | M20 | 60 | 70 | 88 | 296 |
| 14 | 350 | M20 | 70 | 111 | 138 | 296 |
| 16 | 400 | M27 | 80 | 168 | 210 | 336 |
| 18 | 450 | M27 | 80 | 168 | 210 | 336 |
| 20 | 500 | M30 | 100 | 229 | 287 | 432 |
| 24 | 600 | M24 | 120 | Upon request | | |
| 28 | 700 | M30 | 130 | | | |
| 30 | 750 | | | | | |
| 32 | 800 | | | | | |
| 36 | 900 | | | | | |
| 40 | 1000 | | | | | |

15.1.1.3 Stuffing box nuts (TA-Luft)

Table 15-6: PN 10 / 16 / 25 and cl150

| Nominal size | | Stuffing box | Ø Shaft | Pure graphite packing | | Other packings | |
|--------------|------|--------------|---------|------------------------------|-------------|------------------------------|-------------|
| NPS | DN | | | T _{-prescaled} [Nm] | Torque [Nm] | T _{-prescaled} [Nm] | Torque [Nm] |
| 3 | 80 | M10 | 20 | 25 | 19 | 21 | 12 |
| 4 | 100 | M10 | 20 | 25 | 18 | 21 | 12 |
| 6 | 150 | M12 | 25 | 56 | 42 | 47 | 28 |
| 8 | 200 | M12 | 25 | 56 | 42 | 47 | 28 |
| 10 | 250 | M12 | 30 | 65 | 49 | 54 | 33 |
| 12 | 300 | M12 | 35 | 74 | 55 | 61 | 37 |
| 14 | 350 | M16 | 40 | 108 | 81 | 90 | 54 |
| 16 | 400 | M16 | 50 | 130 | 98 | 109 | 65 |
| 18 | 450 | M16 | 50 | 130 | 98 | 109 | 65 |
| 20 | 500 | M20 | 60 | 191 | 143 | 159 | 96 |
| 24 | 600 | M20 | 70 | 302 | 226 | 252 | 151 |
| 28 | 700 | M24 | 70 | 302 | 226 | 252 | 151 |
| 30 | 750 | M20 | 70 | 302 | 226 | 252 | 151 |
| 32 | 800 | M20 | 80 | 340 | 255 | 283 | 170 |
| 36 | 900 | M20 | 80 | 340 | 255 | 283 | 170 |
| 40 | 1000 | M24 | 100 | 498 | 374 | 415 | 249 |

Table 15-7: PN 40 and cl300

| Nominal size | | Stuffing box | Ø Shaft | Pure graphite packing | | Other packings | |
|--------------|------|--------------|---------|------------------------------|-------------|------------------------------|-------------|
| NPS | DN | | | T _{-prescaled} [Nm] | Torque [Nm] | T _{-prescaled} [Nm] | Torque [Nm] |
| 3 | 80 | M10 | 20 | 25 | 19 | 21 | 12 |
| 4 | 100 | M12 | 25 | 56 | 42 | 47 | 28 |
| 6 | 150 | M12 | 30 | 65 | 49 | 54 | 33 |
| 8 | 200 | M12 | 35 | 74 | 55 | 61 | 37 |
| 10 | 250 | M16 | 40 | 108 | 81 | 90 | 54 |
| 12 | 300 | M16 | 50 | 130 | 98 | 109 | 65 |
| 14 | 350 | M20 | 60 | 191 | 143 | 159 | 96 |
| 16 | 400 | M20 | 70 | 302 | 226 | 252 | 151 |
| 18 | 450 | M20 | 70 | 302 | 226 | 252 | 151 |
| 20 | 500 | M20 | 80 | 340 | 255 | 283 | 170 |
| 24 | 600 | M24 | 100 | 498 | 374 | 415 | 249 |
| 28 | 700 | M33 | 110 | Upon request | | | |
| 30 | 750 | M24 | 120 | | | | |
| 32 | 800 | M30 | 130 | | | | |
| 36 | 900 | M30 | 130 | | | | |
| 40 | 1000 | M30 | 130 | | | | |

Table 15-8: PN 63 / 100 and cl600

| Nominal size | | Stuffing box | Ø Shaft | Pure graphite packing | | Other packings | |
|--------------|------|--------------|---------|-----------------------|-------------|------------------|-------------|
| NPS | DN | | | T-presealed [Nm] | Torque [Nm] | T-presealed [Nm] | Torque [Nm] |
| 3 | 80 | M12 | 25 | 56 | 42 | 47 | 28 |
| 4 | 100 | M16 | 30 | 85 | 64 | 71 | 42 |
| 6 | 150 | M16 | 35 | 96 | 72 | 80 | 48 |
| 8 | 200 | M16 | 40 | 134 | 101 | 112 | 67 |
| 10 | 250 | M16 | 50 | 130 | 98 | 109 | 65 |
| 12 | 300 | M20 | 60 | 191 | 143 | 159 | 96 |
| 14 | 350 | M20 | 70 | 302 | 226 | 252 | 151 |
| 16 | 400 | M27 | 80 | 458 | 344 | 382 | 229 |
| 18 | 450 | M27 | 80 | 458 | 344 | 382 | 229 |
| 20 | 500 | M30 | 100 | 625 | 469 | 521 | 313 |
| 24 | 600 | M24 | 120 | Upon request | | | |
| 28 | 700 | M30 | 130 | | | | |
| 30 | 750 | | | | | | |
| 32 | 800 | | | | | | |
| 36 | 900 | | | | | | |
| 40 | 1000 | | | | | | |

15.1.2 Lubricant

Depending on the application and suitability, the following lubricants are approved by the manufacturer:

- Metaflux 70-85 Lubricating metal paste (standard)
- Gleitmo 595 (technical gases)
- Gleitmo 595 with BAM approval (oxygen)

The plant operator is responsible for the use of other lubricants.

15.1.3 Tools

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

15.2 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
- Valve type
- Article number
- Nominal size and version of the valve
- Manual valve/automated valve
- Medium (designation and consistency)
- Medium pressure and temperature
- Flow rate in m³/h
- Bench range of the actuator (e.g. 0.2 to 1 bar)
- 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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E-Mail: sales-pfeiffer-de@samsongroup.com

Internet: www.pfeiffer-armaturen.com

15.3 Spare parts

! NOTE

If additional repairs or the replacement of further individual parts is required for the safe use of the butterfly valves, contact PFEIFFER.

The following spare part kits are available:

- **Seal Kit** contains all soft seals and the stuffing box packing
- **Rep Kit** contains a seal kit including seal ring and seat (series related)

PFEIFFER recommends spare part kits for "Commissioning" and for "2-year operation", see Chapter:

- "15.3.1 "Spare parts for the BR 14t - LTR 43 control and shut-off valve"

15.3.1 Spare parts for the control and shut-off valve BR 14t - LTR 43

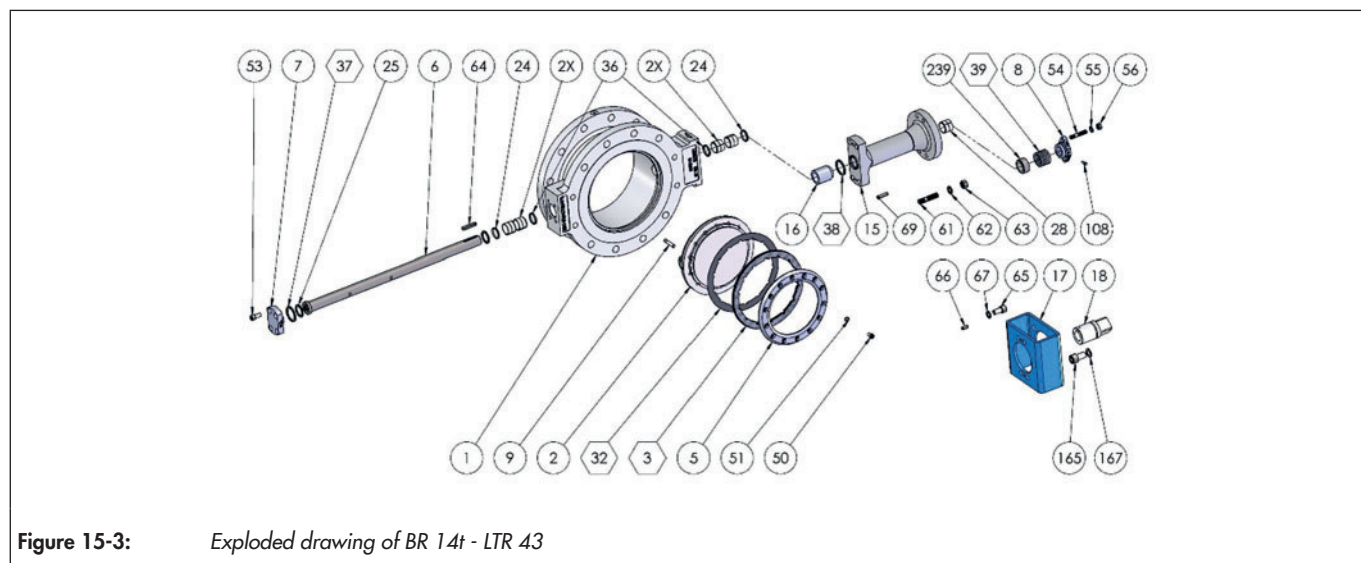


Figure 15-3: Exploded drawing of BR 14t - LTR 43

Table 15-9: Parts list for series BR 14t - LTR 43

| Pos. | Designation |
|------|-------------------|
| 1 | Body |
| 2 | Disc |
| 3* | Seal ring |
| 5 | Retaining ring |
| 6 | Shaft |
| 7 | Cover |
| 8 | Gland |
| 9 | Pin |
| 15 | Extension |
| 16 | Extension spacer |
| 17 | Bracket |
| 18 | Coupling |
| 2X | Bearing |
| 24 | Spacer ring |
| 25 | Thrust ring |
| 28 | Bearing |
| 32* | Gasket disc |
| 36 | Bearing protector |
| 37* | Gasket cover |
| 38* | Gasket extension |

| Pos. | Designation |
|------|-------------------|
| 39* | Packing |
| 50 | Screw |
| 51 | Wedge-lock-washer |
| 52 | Screw |
| 53 | Screw |
| 54 | Stud bolt |
| 55 | Washer |
| 56 | Nut |
| 61 | Stud bolt |
| 62 | Wedge-lock-washer |
| 63 | Nut |
| 64 | Key |
| 65 | Screw |
| 66 | Pin |
| 67 | Wedge-lock-washer |
| 69 | Pin |
| 108 | Screw |
| 165 | Screw |
| 167 | Wedge-lock-washer |
| 239 | Support ring |

* Recommended spare parts



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