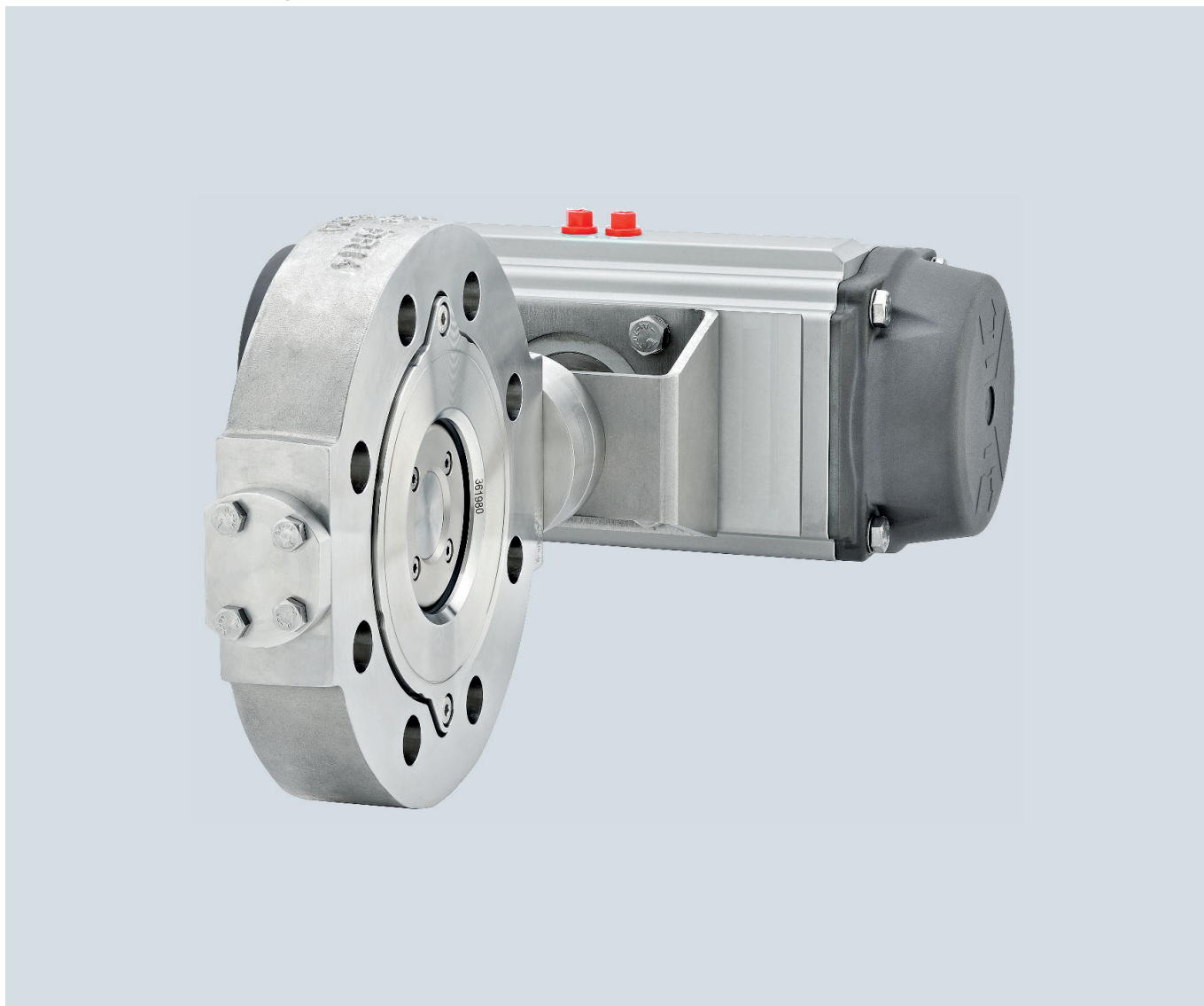


# MOUNTING AND OPERATING INSTRUCTIONS



## EB 14p

Translation of the original manual



**High-Performance Control and Shut-off Butterfly valve  
BR 14p - Type PSA • DIN and ANSI version  
to combine with actuators**

November 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

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#### **DANGER**

*Hazardous situations that lead to death or serious injuries*

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#### **WARNING**

*Situations that can lead to death or serious injuries*

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#### **NOTE**

*Property damage and malfunctions*

---

#### **Info**

*Additional information*

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#### **Tip**

*Recommended action*

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## Content

<b>1</b>	<b>Safety instructions and safety measures</b>	<b>1-1</b>
1.1	Notes regarding possible severe personnel injury	1-2
1.2	Notes regarding possible personnel injury	1-2
1.3	Notes regarding possible property damage	1-3
1.4	Warning notes on the device	1-4
<b>2</b>	<b>Markings on the device</b>	<b>2-1</b>
2.1	Butterfly valve type plate	2-2
2.2	Actuator type plate	2-2
2.3	Turning direction notice sign	2-2
<b>3</b>	<b>Design and principle of operation</b>	<b>3-1</b>
3.1	Variants	3-1
3.2	Additional fittings	3-1
3.3	Attachments	3-2
3.4	Technical data	3-2
3.5	Butterfly valve assembly	3-2
3.5.1	Assembly of butterfly valve	3-2
<b>4</b>	<b>Shipment and on-site transport</b>	<b>4-1</b>
4.1	Accepting delivery	4-1
4.2	Unpacking the butterfly valve	4-1
4.3	Transporting and lifting the butterfly valve	4-1
4.3.1	Transporting	4-1
4.3.2	Lifting	4-1
4.3.3	Lifting points on the body	4-2
4.3.4	Lifting points on the bracket	4-3
4.4	Storing the butterfly valve	4-3
<b>5</b>	<b>Installation</b>	<b>5-1</b>
5.1	Installation conditions	5-1
5.2	Preparing for assembly	5-1
5.3	Assembling the butterfly valve and actuator	5-1
5.4	Installing the butterfly valve in the pipe	5-2
5.4.1	General	5-2
5.4.2	Installing the butterfly valve	5-3
5.5	Checking the assembled butterfly valve	5-3
5.5.1	Functional test	5-3
5.5.2	Pressure test of the pipe section	5-4
5.5.3	Rotary movement	5-4
5.5.4	Fail-safe position	5-4
<b>6</b>	<b>Start-up</b>	<b>6-1</b>
<b>7</b>	<b>Operation</b>	<b>7-1</b>

## Content

<b>8 Malfunction</b>	<b>8-1</b>
8.1 Detecting and rectifying errors	8-1
8.2 Carrying out emergency measures	8-2
<b>9 Servicing</b>	<b>9-1</b>
9.1 Periodic tests	9-1
9.2 Maintenance work	9-2
9.2.1 Replacing the seat ring	9-2
9.2.2 Replace seat ring and valve disc ring	9-2
9.3 Ordering spare parts and consumables	9-2
<b>10 Decommissioning</b>	<b>10-1</b>
<b>11 Removal</b>	<b>11-1</b>
11.1 Removing the butterfly valve from the pipe	11-1
11.2 Disassembling the actuator	11-1
<b>12 Repairs</b>	<b>12-1</b>
12.1 Replacing the V-ring packing	12-1
12.2 Replacing the seat ring	12-1
12.2.1 Replacing the seat ring in butterfly valves from DN 400 (NPS16)	12-1
12.3 Replacing the seat ring and the valve disc ring	12-1
12.4 Disconnecting the valve disc/valve shaft connection	12-3
12.5 Additional repairs	12-3
12.6 Sending devices to PFEIFFER	12-3
<b>13 Disposal</b>	<b>13-1</b>
<b>14 Certificates</b>	<b>14-1</b>
<b>15 Annex</b>	<b>15-1</b>
15.1 Tightening torques, lubricant and tools	15-1
15.1.1 Tightening torques	15-1
15.1.2 Lubricant	15-3
15.1.3 Tools	15-3
15.2 Spare parts	15-3
15.3 Service	15-6

# 1 Safety instructions and safety measures

## Intended use

The PFEIFFER butterfly valve BR 14p - type PSA is in combination with an quarter-tun actuator for the regulation of the volume flow, pressure and temperature of fluid, gaseous or vaporous media with high requirements in the pressure swing adsorption process

- 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.

- Automated butterfly valves are only intended for use, after installation in a pipe system and after connecting the drive to the control, to cut off the media, let it flow through or regulate it within the permitted pressure and temperature limits.
- The data sheet contains the permissible pressure and temperature range for these butterfly valves ► TB 14p.
- The safety regulations that apply to the pipe system in which the valves are installed and to the control system to which the actuator is connected also apply to the butterfly valves.

This manual only provides safety instructions that are to be observed additionally for butterfly valves. There may be additional safety instructions in the manuals for the actuator assemblies.

- It is assumed that this chapter is observed when using the valve as intended.

## Reasonably foreseeable erroneous use and unintended use

The 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 peripheral devices 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 disassembled, dismantled, assembled and commissioned by qualified specialist personnel trained in pressurised pipes who are familiar with the assembly, commissioning and operation of this product.

- 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.

## Personal protective equipment

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

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

## Prohibition of modifications

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

## Protective devices

In the case of a power supply failure, the butterfly valve automatically switches to a certain fail-safe position, see "Fail-safe positions" in Chapter "3 Design and principle of operation".

- The fail-safe position corresponds to the effective direction and is indicated on the type plate of the rotary actuators, see the actuator documentation.
- The valve is to be included in the equipotential bonding of the plant.

## Warning of residual risks

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

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

## Obligation of the operator to exercise diligence

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

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

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

- The butterfly valve is only used as intended as described in this chapter.
- An actuator unit that is subsequently installed on the butterfly valve is adapted to the butterfly valve and the max. torque is observed, and is correctly adjusted in the end positions, and in particular in the closed position of the valve.

- The pipe system and control system are properly installed and regularly checked. The wall thickness of the butterfly valve body is measured such that an additional load of the usual magnitude is taken into account for a pipe system installed properly in this way.
- The valve is connected properly to these systems.
- The customary flow rates in continuous operation are not exceeded in this pipe system.
- It is recommended to contact Pfeiffer in the case of abnormal operating conditions, such as vibrations, hydraulic shock, cavitation and also small amounts of solid matter in the medium, especially abrasive matter.
- Coordinate operating parameters near the cavitation limits and/or with noise emission clearly above 85 dB with PFEIFFER.

### 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 butterfly valves fulfil the requirements of the European Pressure Equipment Directive 2014/68/EU and the European Machinery Directive 2006/42/EC.

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

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

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

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

## 1.1 Notes regarding possible severe personnel injury

### DANGER

#### **Hazards and ineffectiveness of the warranty!**

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

- ⇒ Observe the following hazards and warning information.
- ⇒ Contact PFEIFFER in the case of questions:

### DANGER

#### **Hazards and damage due to unsuitable butterfly valves!**

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

- ⇒ Only operate butterfly valves with a permissible pressure/temperature range (=“rating”) sufficient for the operating conditions, see the data sheet ► TB 14p

#### **Risk of bursting of the pressure equipment!**

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

- ⇒ Observe the maximum permissible pressure the butterfly valve and plant.
- ⇒ Before working on the butterfly valve, depressurise the concerned plant parts and the butterfly valve.
- ⇒ Before removing the butterfly valve from the pipe or loosening the screw connection on the bonnet, completely release the pressure in the pipe so that the medium does not escape uncontrolled from the line.
- ⇒ Empty the medium from the concerned plant parts and butterfly valve. (Wear protective equipment).

## 1.2 Notes regarding possible personnel injury

### WARNING

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

Depending on the utilised medium, butterfly valve components and pipes can become very hot or very cold and cause burns upon contact.

- ⇒ Butterfly valves must be protected against contact in the case of operating temperatures  $>+50\text{ °C}$  or  $<-20\text{ °C}$  together with the pipe connections.

#### **Danger of injury due to pressurised components and escaping medium!**

- ⇒ Do not loosen the screw of an optional test connection while the butterfly valve is pressurised.

#### **Danger of crushing due to moving parts!**

The butterfly valve contains moving parts (actuator stem and control shaft) that can lead to crushing if reaching into it.

- ⇒ Do not reach into the yoke during operation.
- ⇒ When working on the butterfly valve, interrupt and lock pneumatic energy and the control signal.

#### **Danger of injury due to preloaded springs!**

Butterfly valves that are equipped with preloaded actuator springs are under mechanical tension.

- ⇒ Before working on the actuator, release the compression from the preloaded springs, see the corresponding actuator documentation.

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

⇒ Do not reach into the butterfly valve. This can result in serious injuries.

**Danger of injury due to venting the actuator!**

During operation, when regulating or opening and closing the butterfly valve, the actuator can be ventilated.

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

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

When a butterfly valve must be removed from a pipe, medium can escape from the pipe or the butterfly valve.

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

**Danger of injury due to the releasing of body screw connections!**

If the body screw connections must be released, medium can escape from the butterfly valve.

- ⇒ The screw connections on the connection of the body parts may only be released or loosened after the butterfly valve has been removed.
- ⇒ When reassembling, tighten the screws according to the specifications in chapter "15.1.1 Tightening torques" using a torque wrench.

**Hazards due to incorrect butterfly valve use!**

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

- ⇒ The material selected for the parts of the butterfly valve that come into contact with the media must be suitable for the utilised media, pressures and temperatures.

**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.

**Danger due to incorrect installation in case of use as an end fitting!**

The seal is no longer guaranteed if the installation location is incorrect.

- ⇒ Assemble the butterfly valve such that the fastening ring fastened on the valve body with cylinder screws or a tension spring is pressed against the pipe flange.

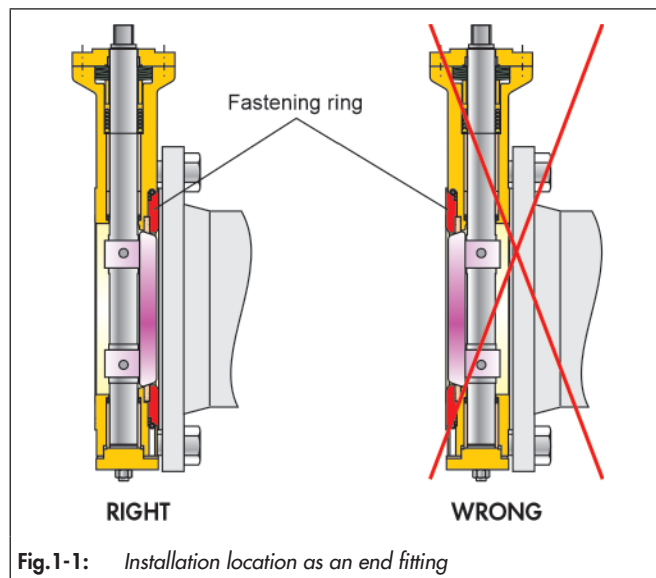


Fig.1-1: Installation location as an end fitting

### 1.3 Notes regarding possible property damage

**NOTE****Damage to the butterfly valve due to contamination!**

Contamination (e.g. solid particles) in the pipes can damage the butterfly valve.

- ⇒ The plant operator is responsible for cleaning the pipes in the plant.
- ⇒ Rinse the pipes prior to commissioning.
- ⇒ Observe the maximum permissible pressure the butterfly valve and plant.

**Damage to the butterfly valve due to unsuitable medium properties!**

The butterfly valve is designed for a medium with certain properties. Other media can damage the butterfly valve.

- ⇒ 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. Deviating torques can lead to butterfly valve leakage or damage.

- ⇒ Excessively tightened components are subject to increased wear.
- ⇒ Insufficiently tightened components can cause leakage.
- ⇒ Observe the tightening torques, see chapter "15.1.1 Tightening torques".

**Specific aspects in case of use for control purposes!**

- ⇒ In the case of use for control purposes, observe the limitations indicated above in the data sheets.

**NOTE**

**Deviation of the breakaway and actuating forces due to non-actuation of the butterfly valve!**

Depending on the period of time of non-actuation, the breakaway and actuation forces can deviate considerably from the actuating power data in the data sheet.

It is recommended to actuate the butterfly valve at regular intervals.

- ⇒ In consideration of the design, actuation must take place during the year.
- ⇒ Indicate the duration of non-actuation when making an enquiry, so that this condition is taken into consideration in the actuator design.
- ⇒ In the case of retrofitted actuators by the operator, the correct actuator design as regards the duration of non-actuation is no longer the responsibility of PFEIFFER.

**Damage to the seat ring or the sealing strip**

Turning the valve disc over 0° leads to irreparable damage to the seat ring or the sealing strip.

- ⇒ Only operate the valve disc within the range of 0°-90°

**Damage to the butterfly valve due to unsuitable tools!**

Unsuitable tools can damage the butterfly valve.

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

**Damage to the butterfly valve due to unsuitable lubricants!**

Unsuitable lubricants can corrode and damage the surface.

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

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

## 1.4 Warning notes on the device

### Warning of moving parts

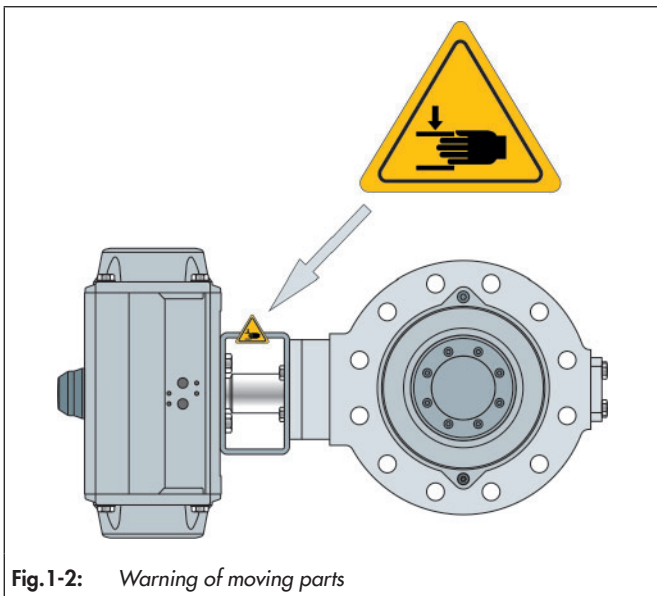
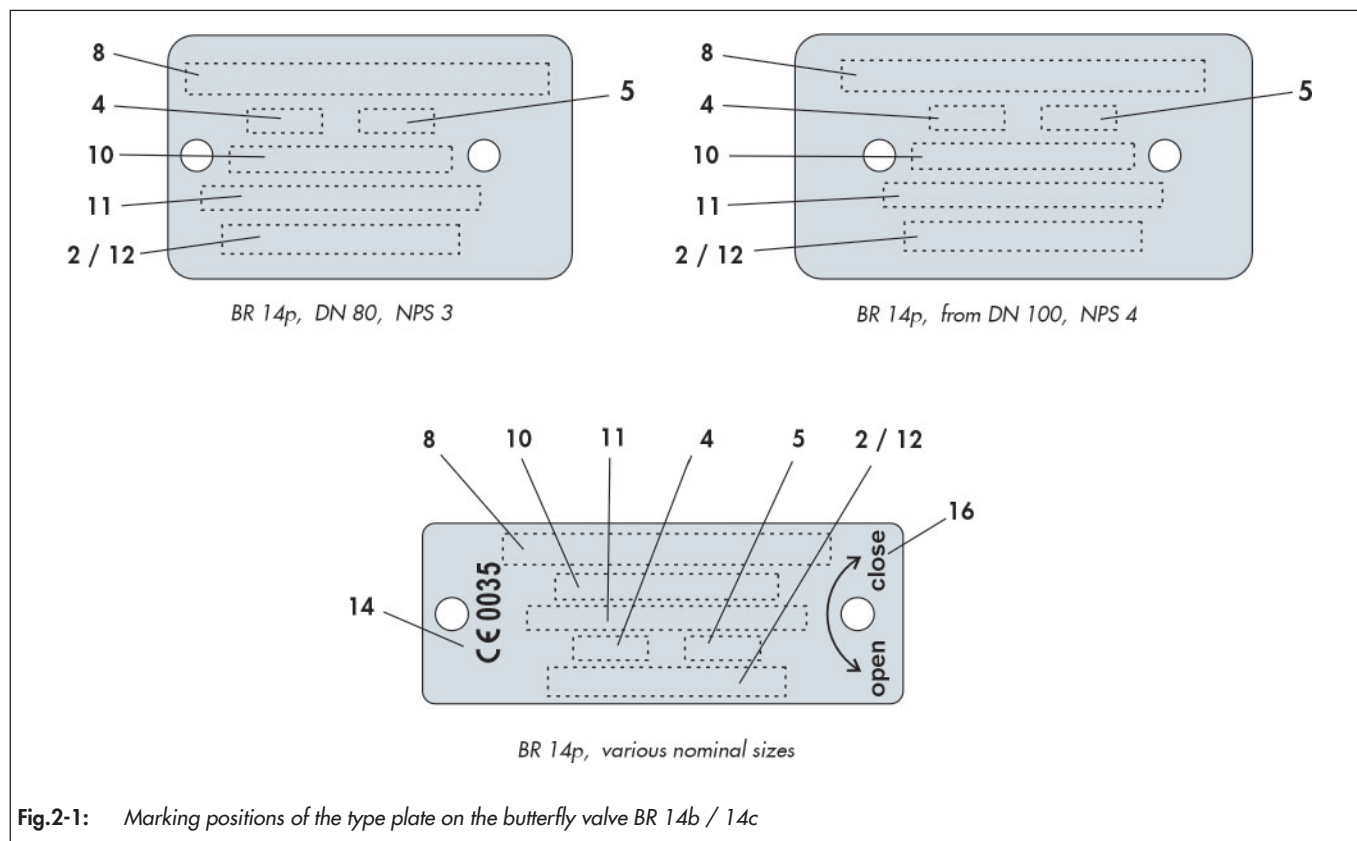


Fig.1-2: Warning of moving parts





## 2.1 Butterfly valve type plate

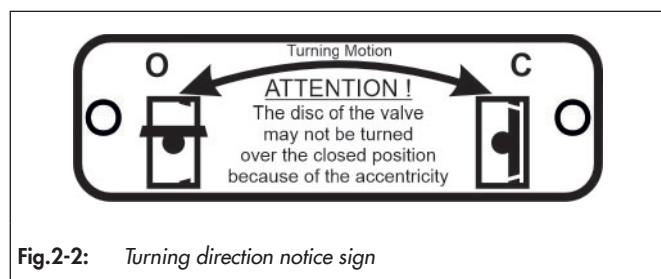


## 2.2 Actuator type plate

See the corresponding actuator documentation.

## 2.3 Turning direction notice sign

The turning direction is indicated on the butterfly valve by a sign.



### 3 Design and principle of operation

#### Version

Pressure swing adsorption (PSA) is a method used to separate a gas from a gas mixture as well as to dry or clean gases.

The purity and quantity of the gas to be extracted strongly depends on the control valves used in this process.

The control valves used in PSA applications must shut-off tightly, have short opening and closing times as well as a high level of operational reliability.

The double-eccentric control and shut-off butterfly valve BR 14p - type PSA fulfils these high requirements.

#### Function and principle of operation

The process medium can flow through the valve in both directions.

The valve disc (4) determines the flow through the free area between valve disc and seat ring (14). Butterfly valves are sealed between the valve disc (4) and the seat ring (14).

The control shaft (2) is sealed by a packing (15). The standard packing is a maintenance-free PTFE V-ring packing which is loaded by disc springs (13).

Optionally, a Graphite/Inconel packing can be used which is also loaded by disc springs (14).

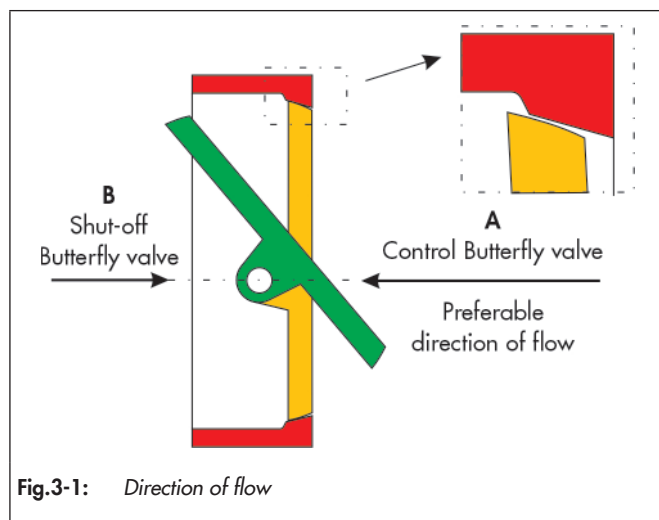


Fig.3-1: Direction of flow

The direction of flow and the differential pressure determine the breakaway torque to open the butterfly valve.

The double-eccentric bearing design of the control shaft causes the valve disc on opening and closing to remain in contact with the seat only over a very small angle of rotation, see Fig. 3-1. This reduces wear and increases the service life of the valve. In addition, it reduces the breakaway torque.

When the process medium flows through the valve in **direction A** (Fig. 3-1), the valve disc is slightly pressed out of the seat. This reduces the pre-load force and the breakaway torque.

When the process medium flows through the valve in **direction B**, the pre-load force increases as the breakaway torque rises.

#### Fail-safe position

Depending on the mounting of the pneumatic actuator, the butterfly valve has two fail-safe positions that are activated when the pressure is released as well when the supply air fails:

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

Upon air failure, the butterfly valve is closed. The butterfly valve opens when the signal pressure increases, acting against the force of the springs.

- **Butterfly valve with fail-open actuator [FO]:**

Upon air failure, the butterfly valve is opened. The butterfly valve closes when the signal pressure increases, acting against the force of the springs.

#### Changing the fail-safe position

The fail-safe position of the actuator can be reversed if required, for this purpose see the installation and operating instructions for the respective pneumatic actuator.

#### Operating elements and functions

The BR 14p - type PSA butterfly valve can be selected in the following versions:

- With BR 30a diaphragm multi-turn actuator.
- With rotary actuators from other manufacturers (for details, see the relevant data sheet).

#### 3.1 Variants

- Special material
- Low-temperature version

#### 3.2 Additional fittings

##### Strainer

PFEIFFER recommends installing a strainer in front of the butterfly valve. A strainer prevents the solid content in the medium from damaging the butterfly valve.

##### Bypass and shut-off valve

PFEIFFER recommends installing a shut-off valve in front of the strainer as well as behind the butterfly valve and to create a bypass. By means of the bypass, the entire plant does not have to be decommissioned during maintenance and repair work on the butterfly valve.

##### Insulation

The butterfly valves can be insulated to reduce the passage of heat energy. Observe the notes in Chapter "5 Assembly".

##### Test connection

In the version with a double stuffing box, a test connection (e.g. G $\frac{1}{4}$ "") can be used on the upper flange to check the tightness of the butterfly valve towards the atmosphere.

### Grip protection

In the case of conditions of use that require a high level of safety (e. g. if the butterfly valve is freely accessible to untrained specialist personnel), PFEIFFER offers a safety guard to prevent the risk of crushing due to moving parts (actuator- and control shaft). The risk assessment of the plant by the operator will indicate if the installation of this protective device is required for the safe operation of the butterfly valve in the plant.

### 3.3 Attachments

The following accessories are available either individually or in combinations:

- Control shaft extension (100 mm standard)
- Pneumatic or electric rotary actuator
- 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 offer information about the valve version, see Chapter "2 Markings on the device".

#### **i** Info

- Detailed information is available in the data sheet ► TB 14p.
- The documentation for the special ball valves BR 14p that are not described in this chapter can be requested from PFEIFFER.

### 3.5 Butterfly valve assembly

The BR 14p - type PSA butterfly valves have design differences in the various versions so that they cannot be documented in one construction manual.

- Chapter 3.5.1 describes the assembly of the BR 14p - type PSA butterfly valve in the standard version.
- BR 14p - type PSA butterfly valve in other versions are described in separate chapters.

#### Preparation of the assembly

To assemble the butterfly valve, all parts must be prepared, e.g. the parts are carefully cleaned and placed on a soft mat (rubber mat or other). Keep in mind that plastic parts are almost always very soft and very delicate, and in particular the sealing surfaces may not be damaged.

#### **!** NOTE

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

PFEIFFER recommends a heavy-duty grease paste (e.g. Gleitmo 805, manufacturer Fuchs) to prevent the cold-welding of the screws in the bodies.

- ⇒ Do not use this product for butterfly valves with use of oxygen.
- ⇒ A suitable lubricant must be selected for grease-free butterfly valves, especially for use with oxygen.

#### **i** Info

The position and arrangement of the individual parts shown in the drawings must be observed during assembly.

### 3.5.1 Assembly of butterfly valve

#### 3.5.1.1 Preassembly of the butterfly valves

- ⇒ Place the valve body (1) on a clean surface at working height so that the bearing area of the shaft is easy to reach.
- ⇒ Insert the ring (23) into the groove on the stuffing box side of the valve housing (1).
- ⇒ Screw the intermediate flange (6) to the valve housing (1) using screws (30).

#### **i** Info

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

- ⇒ Press the bearing bush (10a) from the stuffing box side into the shaft bore of the valve housing (1) as far as it will go using a suitable mandrel.
- ⇒ Insert the distance bush (12a).
- ⇒ Press the bearing bush (10b) from the bonnet side into the shaft bore of the valve housing (1) as far as it will go using a suitable mandrel.
- ⇒ Insert the distance bush (12b).

#### 3.5.1.2 Modular unit of the valve disc and control shaft

#### **i** Info

The valve disc (4) forms a modular unit with the control shaft (2), which is easily assembled with grooved pins (28). This unit may be separated for assembly.

- ⇒ Only ever use these components together.

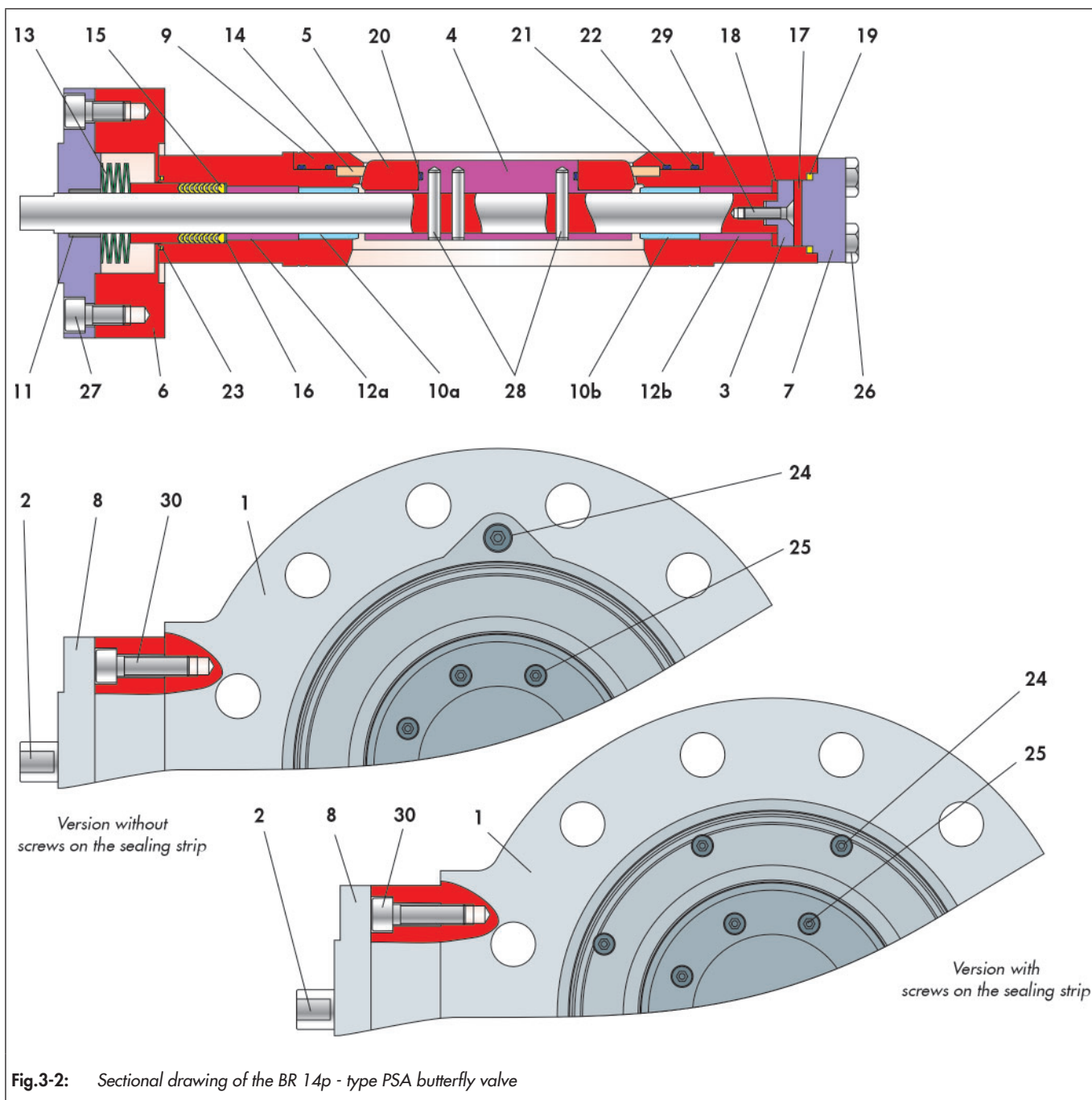


Table 3-2: List of parts

Item	Description	Item	Description	Item	Description
1	Valve body	11	Bearing bush	21	O-ring
2	Control shaft	12	Distance bush	22	O-ring
3	Shaft head	13	Disc spring set	23	Ring
4	Valve disc	14	Seat ring	24	Screw
5	Valve disc ring	15	V-ring packing	25	Screw
6	Intermediate flange	16	Disc	26	Screw
7	Bonnet	17	Disc	27	Screw
8	Stuffing box flange	18	Disc	28	Grooved pin
9	Fastening ring	19	Ring	29	Screw
10	Bearing bush	20	O-ring	30	Screw

### 3.5.1.3 Assembling the valve disc, control shaft and valve body

- ⇒ Place the valve disc (4) with the sealing side facing downwards on a surface positioned at working height.
- ⇒ Carefully place the valve housing (1) with the side of the sealing strip facing upwards over the valve disc so that it is centred in the passage of the housing.

#### **!** NOTE

##### **Damage due to improper assembly!**

- ⇒ Do not damage the sealing surfaces of the valve body and the valve disc.

#### **i** Info

The bearing bores of the valve disc (4) must be aligned with the shaft bore of the valve body (1). The eccentricity of the valve disc must also be taken into account.

- ⇒ Push the control shaft (2) through the shaft bore of the valve body (1) and the bearing bores of the valve disc (4).
- ⇒ Pin the valve disc (4) and control shaft (2) with grooved pins (28).

### 3.5.1.4 Final assembly of the butterfly valve

- ⇒ From the bonnet side, push the disc (18) over the control shaft up to the mounted distance bush (12b).
- ⇒ Screw the shaft head (3) onto the face of the control shaft using the screw (29).
- ⇒ Push the ring (19) onto the bonnet (7).
- ⇒ Insert the disc (17) into the recess provided in the bonnet (7).
- ⇒ Insert the pre-assembled bonnet into the shaft bore of the valve body and adjust with screws (26).
- ⇒ Tighten the screws (26) evenly and alternately.

#### **i** Info

The permissible torque for tightening the bonnet can be found in Table 15-3 in Chapter "15.1.1 Tightening torques."

- ⇒ From the stuffing box side, push the disc (16) over the control shaft to the corresponding position in the valve body.
- ⇒ Push the PTFE V-ring packing (15) over the control shaft into the body bore and press in with an assembly sleeve. Refer to the sectional drawing Fig. 3-2 for the arrangement of the V-ring packing.
- ⇒ Insert the disc spring set (13). The arrangement of the disc springs is shown in the sectional drawing in Fig. 3-2.
- ⇒ Press the bearing bush (11) into the stuffing box flange (8).
- ⇒ Place the pre-assembled stuffing box flange on the intermediate flange and adjust with screws (27).

- ⇒ Tighten the screws (27) evenly and alternately.

#### **i** Info

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

### 3.5.1.5 Final assembly of the valve disc

- ⇒ Turn the valve body by 180° so that the sealing surface of the valve disc is facing upwards.
- ⇒ Insert the O-ring (20) into the groove of the already assembled valve disc (4). Ensure cleanliness.
- ⇒ Place the valve disc ring (5) on the valve disc and adjust with screws (25).
- ⇒ Tighten the screws (25) evenly and alternately.

#### **i** Info

The permissible torque for tightening the valve disc ring can be found in Table 15-4 in Chapter "15.1.1 Tightening torques."

- ⇒ Push the seat ring (14) onto the fastening ring (9).
- ⇒ Insert the O-rings (21 and 22) into the grooves of the fastening ring. Ensure cleanliness.
- ⇒ Place the pre-assembled fastening ring in the corresponding recess in the valve body and adjust with the screws (24).

#### **!** NOTE

##### **Damage due to improper assembly!**

- ⇒ Do not damage sealing surfaces.

- ⇒ Tighten the screws (24) evenly and alternately.

#### **i** Info

The permissible torque for tightening the fastening ring can be found in Table 15-5 in Chapter "15.1.1 Tightening torques."

## 4 Shipment and on-site transport

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

### ! NOTE

#### **Damage to the butterfly valve due to improper transport and storage!**

- ⇒ Butterfly valves must be handled, transported and stored with care.

### 4.1 Accepting delivery

Perform the following steps after receiving the goods:

- ⇒ Check the scope of supply. Compare the delivered goods with the delivery note.
- ⇒ Check the supply for transport damage. Report transport damage to PFEIFFER and the transport company (see the delivery note).

### 4.2 Unpacking the butterfly valve

Carry out the following steps:

- ⇒ Unpack the butterfly valve directly before lifting for installation into the pipe.
- ⇒ Leave the butterfly valve on the pallet or in the transport container for on-site transport.
- ⇒ The protective caps on the butterfly valve inlet and outlet prevent foreign matter from entering the butterfly valve and damaging it. Only remove the protective caps prior to installation in the pipe.
- ⇒ Dispose of the packaging properly.

### 4.3 Transporting and lifting the butterfly valve

#### ! DANGER

#### **Danger due to falling of suspended loads!**

*Do not stand under suspended loads.*

#### ! WARNING

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

- ⇒ Only used approved lifting equipment and load lifting equipment whose lifting capacity corresponds at least to the weight of the butterfly valve including the actuator.
- ⇒ Take the weights from the respective data sheet.

#### ! WARNING

#### **Danger of injury due to the tipping of the butterfly valve!**

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

#### ! NOTE

#### **Damage to the butterfly valve due to improper fastening of the sling!**

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

- ⇒ When lifting the butterfly 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.
- ⇒ Do not use the control air lines, accessories or other components with safety functions for suspension or damage them.

### 4.3.1 Transporting

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

- ⇒ Leave the butterfly valve on the pallet or in the transport container for transport.
- ⇒ Butterfly valves that weigh more than approx. 10 kg should be transported on a pallet (or supported similarly) (also to the installation site). The packaging should protect the butterfly valves from damage.
- ⇒ Comply with the transport conditions.

#### Transport conditions

- ⇒ Protect the butterfly valve against external influences, such as impacts.
- ⇒ Do not damage the corrosion protection (paint, surface coating). Repair damage immediately.
- ⇒ Protect the butterfly valve against moisture and dirt.

### 4.3.2 Lifting

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

#### Conditions for lifting

- ⇒ Use a hook with a safety clamp as the suspension element so that the sling cannot slip off the hook during lifting and transport, see Fig. 4-1.
- ⇒ Secure the sling against shifting and slipping off.

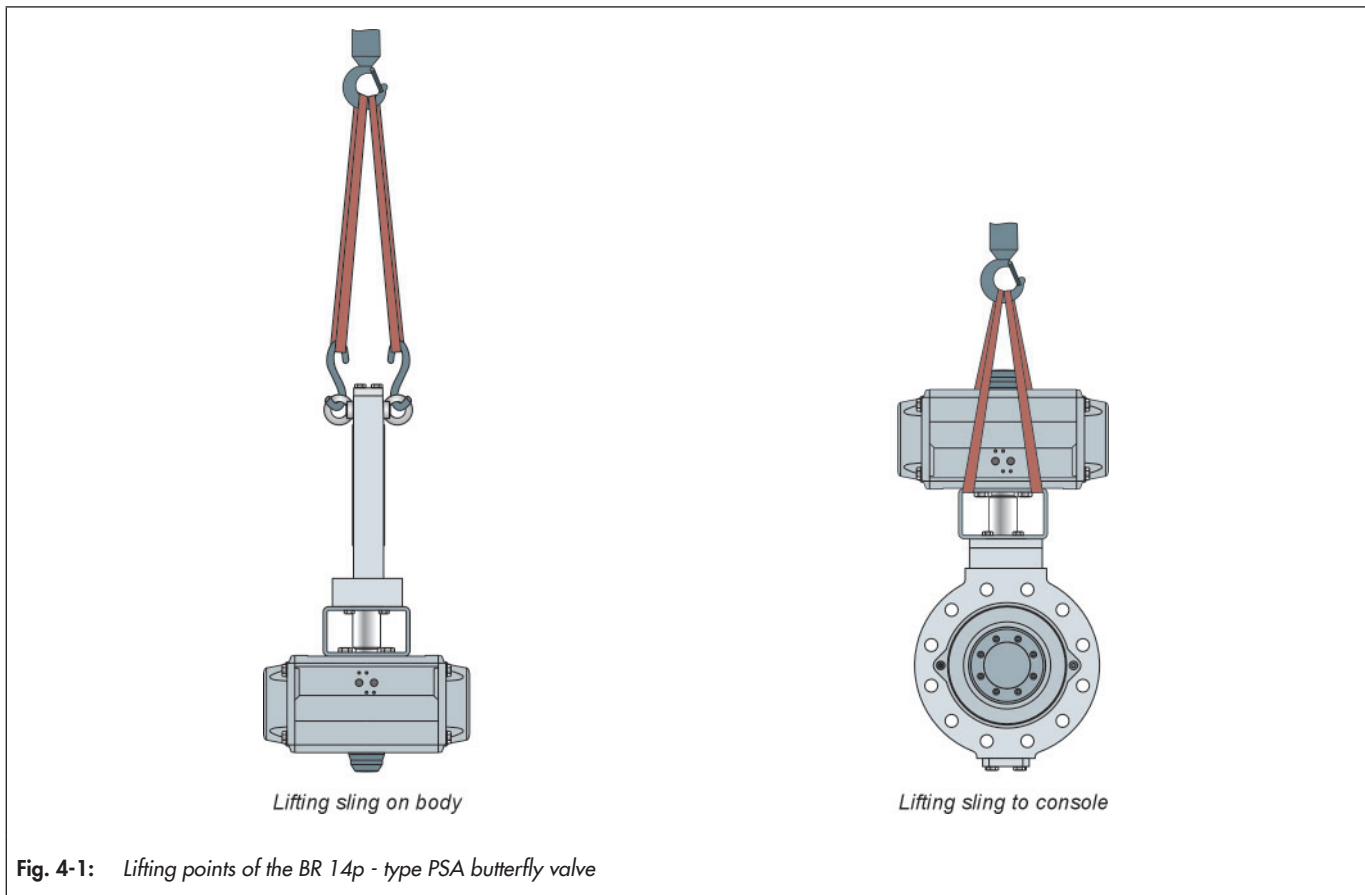


Fig. 4-1: Lifting points of the BR 14p - type PSA butterfly valve

- ⇒ Fasten the sling such that it can be removed again after installation in the pipe.
- ⇒ Avoid swinging and tipping the butterfly valve.
- ⇒
- ⇒ In the case of interruptions in work, do not leave the lifting equipment suspended in the air for a long period of time.
- ⇒ Lift the butterfly valves aligned in the same direction in which they will be installed in the pipe.
- ⇒ Always lift the butterfly valve in the centre of gravity of the load to prevent uncontrolled tipping.
- ⇒ Make sure that in the case of butterfly valves, any slings between the lifting eyes on the rotary actuator and suspension element are not loaded. These slings are used only to secure the load against turning over while lifting. Before lifting the butterfly valve, pretension this sling so it is taut.

**⚠ DANGER**

**Danger due to incorrect lifting and transport!**

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

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

### 4.3.3 Lifting points on the body

- ⇒ Attach the eye bolts in the flange bores in the body. When doing so, make sure that the carrying capacity of the utilised eye bolts is sufficient.
- ⇒ Connect the lifting sling with hooks to the eye bolts. Make sure that the hook is seated properly in the eye bolts.
- ⇒ Fasten a lifting sling to each suspension element (e.g. hook) of the crane or forklift, see Fig. 4-1. When doing so, ensure the safety, bearing capacity and length of the lifting slings.
- ⇒ In the case of an actuator with a lifting eye: fasten additional lifting slings to the lifting eye on the actuator and on the suspension element.
- ⇒ Lift the butterfly valve carefully. Check if the load lifting equipment holds.
- ⇒ Move the butterfly valve at a constant speed to the installation site.
- ⇒ Install the butterfly valve in the pipe, see chapter 5.4
- ⇒ After installation in the pipe: check that the flanges are firmly tightened and that the butterfly valve holds in the pipe.
- ⇒ Remove the lifting slings.



### 4.3.4 Lifting points on the bracket

- ⇒ Fasten a lifting sling to the bracket and the suspension element (e.g. hook) of the crane or forklift, see Fig. 4-1. When doing so, ensure the safety, bearing capacity and length of the lifting slings.
- ⇒ In the case of an actuator with a lifting eye: fasten additional lifting slings to the lifting eye on the actuator and on the suspension element.
- ⇒ Lift the butterfly valve carefully. Check if the load lifting equipment holds.
- ⇒ Move the butterfly valve at a constant speed to the installation site.
- ⇒ Install the butterfly valve in the pipe, see chapter 5.4
- ⇒ After installation in the pipe: check that the flanges are firmly tightened and that the butterfly valve holds in the pipe.
- ⇒ Remove the lifting slings.

## 4.4 Storing the butterfly valve

### ! NOTE

#### **Damage to the butterfly valve due to improper storage!**

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

### i Info

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

- ⇒ In the case of storage prior to installation, the valve should normally be stored in a closed room where it is protected against harmful influences such as impacts, dirt or moisture. A room temperature of  $25\text{ °C} \pm 15\text{ °C}$  is recommended.
- ⇒ In particular, the actuator and the ends of the butterfly valve to the pipe connection may not be damaged by mechanical or any other influences.
- ⇒ Do not stack the butterfly valves.
- ⇒ Prevent condensation in damp rooms. Use a desiccant or heater.
- ⇒ The butterfly valve must be stored in its protective packaging and/or with the protective caps on the connection ends.
- ⇒ Butterfly valves that weigh more than approx. 10 kg should be stored on a pallet (or supported similarly).
- ⇒ Butterfly valves are usually delivered in a closed position. They must be stored in the position in which they were delivered. The actuating device must not be actuated.

### i Info

- In the case of butterfly valves that are delivered without an actuator, the valve disc is not secured to prevent it from moving. It must not be opened from the closed position due to external influences (e.g. shaking).
- Only in the case of butterfly valves with a pneumatic actuator does the valve disc protrude outside of the body on body sides in the delivered state. The packaging on the protruding edge should protect the valve disc from damage.

- ⇒ Do not place any objects on the butterfly valve.



## 5 Installation

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task. The following instructions apply additionally for butterfly valves. Observe chapter "4.3 Transporting and lifting the butterfly valve" for transport to the installation site.

### 5.1 Installation conditions

#### Operator level

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

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

#### Pipe routing

The guidelines applicable on site apply for the installation of BR 14p - type PSA butterfly valves in the pipe.

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

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

#### Installation position

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

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

#### Support and mounting

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

#### Venting

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

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

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

### 5.2 Preparing for assembly

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

#### Perform the following steps after receiving the goods:

- ⇒ Check the scope of supply. Compare the delivered goods with the delivery note.
- ⇒ Check the supply for transport damage. Report transport damage to PFEIFFER and the transport company (see the delivery note).

#### Ensure the following conditions prior to assembly:

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

### 5.3 Assembling the butterfly valve and actuator

PFEIFFER butterfly valves are supplied 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 butterfly valve.

#### WARNING

#### **Danger and damage due to retrofitting an actuator unit!**

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

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

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

⇒ *It must be made sure that the valve in the "CLOSED" position is turned off by the signal of the torque switch.*

⇒ *In the "OPEN" position, the butterfly valve must be turned off by the limit switch.*

⇒ *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 manual.*

#### **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.*

**WARNING**

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

Double eccentric butterfly valves must always be closed clockwise!

- ⇒ Observe the turning direction when assembling an actuator.
- ⇒ The turning direction is indicated on the butterfly valve by a sign, see Fig. 5-1.

**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.

- ⇒ The adjustment of the "OPEN" and "CLOSED" end stops is the responsibility of the user.

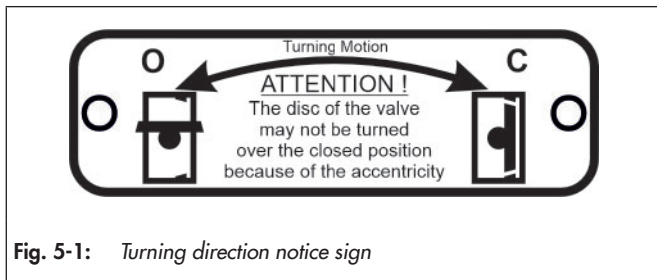


Fig. 5-1: Turning direction notice sign

## 5.4 Installing the butterfly valve in the pipe

### 5.4.1 General

- ⇒ Transport the valve in its original packaging to the installation site and unpack it only there.
- ⇒ Inspect the butterfly valve and actuator for transport damage. Damaged butterfly valves or actuators may not be installed.
- ⇒ Handle the butterfly valve with care and observe the instructions for the flange connection.
- ⇒ Make sure that only butterfly valves are installed whose pressure classes, connection type (flow rate), type of lining and connection dimensions match the conditions of use. See the corresponding marking on the butterfly valve.
- ⇒ The counterflanges must have smooth sealing surfaces. Other flange shapes must be agreed upon with PFEIFFER.

**DANGER**

**Danger due to exceeding the limits of use!**

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

- ⇒ No butterfly valve may be installed whose permissible pressure/temperature range is not sufficient for the operating conditions.
- ⇒ The max. permissible limits of use are marked on the butterfly valve, see Chapter "2 Markings on the device".
- ⇒ The permissible range is defined in Chapter "1 Safety instructions and safety measures".

- ⇒ The connection ends of the pipe must align with the butterfly valve connections and have plane-parallel ends.
- ⇒ The connection data for the actuator unit must match the control data. See the type plate(s) on the actuator unit.
- ⇒ Prior to installation, the butterfly valve and the connected pipe must be carefully cleaned of any contamination, in particular solid foreign matter.
- ⇒ The sealing surfaces on the flange connection and the utilized flange seals must in particular be free of all contamination during installation.
- ⇒ An arrow is marked on the body. The direction of the arrow must correspond to the direction of flow in the pipe.

**i Info**

**It may be necessary in special cases for a butterfly valve to be tight against the direction of flow.**

For installation in these special cases, contact PFEIFFER as this could lead to an excessive strain on the seat ring, washer, etc.

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

**NOTE**

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

⇒ Tighten the flange connections evenly and in a criss-cross pattern with the torques indicated in Table 15-6.

- ⇒ After a long storage period, retighten the body screws according to the specifications in chapter "15.1.1. Tightening torques".
- ⇒ Vents are screwed into the exhaust air connections of pneumatic and electropneumatic devices to ensure that the generated exhaust air can be released to the outside (protection against overpressure in the device).  
Furthermore, vents allow the intake of air (protection against underpressure in the device).

- ⇒ Carry out venting on the side that faces away from the working area of operating personnel.
- ⇒ When installing peripheral devices, make sure that they can be operated from the working area of operating personnel.

#### NOTE

#### Damage to the valve due to improper installation!

The valve disc could be damaged and the butterfly valve could leak.

- ⇒ Push the butterfly valve with a closed valve disc into the gap between the pipe flanges.
- ⇒ The inside diameter of the counterflange must leave enough space for the opened valve disc so that it is not damaged when swinging out, see Table 5-1.

**Table 5-3:** Minimum required inner diameter  $D_i$  of the counterflange

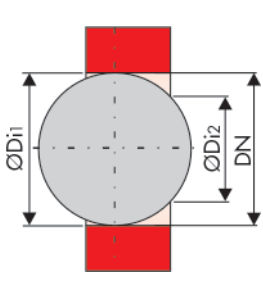
Nominal size		$\varnothing D_i$	$\varnothing D_{i2}$ Row 16	
DN	NPS			
80	3	54	-	
100	4	78	-	
150	6	128	118	
200	8	180	166	
250	10	227	217	
300	12	276	260	
350	14	308	301	
400	16	365	348	

Fig. 5-2: In diameter

## 5.4.2 Installing the butterfly valve

- ⇒ Close the butterfly valve in the pipe for the duration of the installation.
- ⇒ Remove the protective caps on the valve openings prior to installation.
- ⇒ Lift the butterfly valve with suitable lifting equipment at the installation site, see chapter "4.3 Transporting and lifting the butterfly valve". When doing so observe the flow direction of the butterfly valve. An arrow on the butterfly valve indicates the flow direction.
- ⇒ Make sure that the correct flange seals are used.
- ⇒ Screw the pipe together with the butterfly valve without tension.
- ⇒ After installation, open the butterfly valve slowly in the pipe.

#### NOTE

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

Open the butterfly valve slowly in the pipe during commissioning.

#### Info

#### Observe the following for butterfly valves with a metal seat:

To avoid damaging the seat seal, make sure that the pipe connected upstream and downstream of the butterfly valve is cleaned carefully of all rigid and abrasive particles prior to installation.

- ⇒ Check the correct function of the butterfly valve.

## 5.5 Checking the assembled butterfly valve

### 5.5.1 Functional test

#### WARNING

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

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

#### 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 and, if necessary, hearing protection when working near valves.

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

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

#### WARNING

#### Danger due to improperly executed control commands!

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

- ⇒ Check the actuator unit and control command., see chapter "8 Malfunction".

## 5.5.2 Pressure test of the pipe section

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

- ⇒ First carefully rinse newly installed pipe systems in order to wash out all foreign matter.
- ⇒ Ensure the following conditions for the pressure test:
  - Valve open: The test pressure may not exceed the value  $1.5 \times PN$  (according to the type plate).
  - Valve closed: The test pressure may not exceed the value  $1.1 \times PN$  (according to the type plate).

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

---

### **i** Info

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

---

## 5.5.3 Rotary movement

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

- ⇒ Open and close the butterfly valve. When doing so, observe the movement of the actuator shaft.
- ⇒ Set the maximum and minimum control signal in succession to check the end positions of the butterfly valve.
- ⇒ Check the display on the position indicator.

## 5.5.4 Fail-safe position

- ⇒ Close the signal pressure line.
- ⇒ Check whether the butterfly valve moves to the fail-safe position, see Chapter "Fail-safe positions in Chapter "3 Design and principle of operation".

## 6 Start-up

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

### WARNING

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

Valve components and pipes can become very hot or very cold during operation and cause burns upon contact.

- ⇒ Let the components and pipes cool down or warm up.
- ⇒ Wear protective garments and protective gloves.

#### **Danger of injury due to pressurised components and escaping medium!**

- ⇒ Do not loosen the screw of an optional test connection while the butterfly valve is pressurised.

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

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

#### **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 and, if necessary, hearing protection when working near valves.

### **Ensure the following conditions prior to commissioning/recommissioning:**

- The BR 14p - type PSA butterfly valve is installed properly in the pipe, see Chapter "5 Assembly".
- The leak and function tests have been completed successfully, see Chapter "5.1 Installation conditions".
- No residual amounts of water are present in the flow section of the valve to prevent a possible reaction with the medium.
- The current conditions in the concerned plant section correspond to the design of the butterfly valve, see Intended use in Chapter "1 Safety instructions and safety measures".

### **Commissioning/recommissioning**

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





## 7 Operation

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

### WARNING

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

Valve components and pipes can become very hot or very cold during operation and cause burns upon contact.

- ⇒ Let the components and pipes cool down or warm up.
- ⇒ Wear protective garments and protective gloves.

#### **Danger of injury due to pressurised components and escaping medium!**

- ⇒ Do not loosen the screw of an optional test connection while the butterfly valve is pressurised.

#### **Danger of crushing due to moving actuator- and control shafts!**

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

#### **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 and, if necessary, hearing protection when working near valves.

### Observe the following points during operation:

- After commissioning and reaching the operating temperature, it may be necessary to retighten all flange connections between the pipe and butterfly valve with the corresponding tightening torques, see Table 15-6 in Chapter "15.1.1 Tightening Torques".
- It may also be necessary to tighten the screw connections of the body parts according to the respective specifications in chapter "15.1.1 Tightening torques".
- The butterfly valve/actuator unit must be actuated with the control signals.
- Butterfly valves that were delivered from the factory with an actuator are precisely adjusted. The user is responsible for any changes they make.

- For the manual operation or manual override of the actuator (if present), normal manual forces are sufficient and the use of extensions to increase the actuation torque is not permitted.
- If a butterfly valve leaks, observe chapter "8 Malfunction".



## 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	Possible cause	Measures
Leaks in the pipe connection	The flange connection of the butterfly valve is leaky	<p>Tighten the flange screws:</p> <hr/> <p><b>! NOTE</b></p> <p><b>An excessive tightening torque when retightening the flange screws can damage the butterfly valve and pipe!</b></p> <p><i>The permissible torque for retightening the pipe flange screws is limited.</i></p> <hr/> <p>Retighten the flange connection with the respective tightening torque, see Table 15-6 in Chapter "15.1.1 Tightening torques".</p> <p>If necessary, increase the tightening torque to max. 20%.</p>
	The flange connection is still leaky after retightening	<p>Loosen the flange connection and remove the butterfly valve, see chapter "1 Safety instructions and safety measures".</p> <p>Check the plane parallelism of the flange connection and correct if it is not sufficient.</p> <p>Check the flange seals: if the seals are damaged, replace them.</p>
Leakage on the bonnet	Connection of the bonnet to the valve body released	Retighten the bonnet screws.
	Bonnet still untight after retightening	Replace the cover sealing and/or butterfly valve, see chapter "1 Safety instructions and safety measures".
Leaks in the control shaft sealing	Medium escapes	<p><b>! DANGER</b></p> <p><b>Danger of injury due to escaping medium!</b></p> <p><i>To protect operating personnel from danger, depressurise the line on both sides of the butterfly valve, see Chapter "1 Safety instructions and safety measures".</i></p>
	Medium escapes from the stuffing box flange	<p>Remove the butterfly valve, see chapter "1 Safety instructions and safety measures".</p> <p>Disassemble the butterfly valve and replace the control shaft sealing.</p> <p>Request spare parts from PFEIFFER, see Chapter "15.2 Spare parts".</p> <p>For the required repair instructions, see Chapter "12 Repairs".</p>
Increased medium flow rate with the butterfly valved closed	Leakage in the closed position	<p>Close the butterfly valve 100%.</p> <p>If the butterfly valve is in the closed position, check if the actuator closes with full torque.</p> <p>If the actuator closes with full torque, open/close the butterfly valve when pressurised multiple times.</p> <p>If the butterfly valve is still leaky, increase the tightening torque of the actuator in the "CLOSED" position up to maximum 1.1 x the nominal torque.</p> <p>If the butterfly valve is still leaky, it could be damaged.</p>
	The butterfly valve is damaged	<p>Repairs are necessary.</p> <p>Remove the butterfly valve, see chapter "1 Safety instructions and safety measures".</p> <p>Request spare parts from PFEIFFER, see Chapter "15.2 Spare parts".</p> <p>For the required repair instructions, see Chapter "12 Repairs".</p>

Type of fault	Possible cause	Measures
Malfunction	The actuator unit or control does not react	Check the actuator unit and control command.
	The actuator and control are OK	Remove and inspect the butterfly valve, see chapter "1 Safety instructions and safety measures".
	The butterfly valve is damaged	Repairs are necessary. Remove the butterfly valve, see chapter "1 Safety instructions and safety measures". Request spare parts from PFEIFFER, see Chapter "1.5.2 Spare parts". For the required repair instructions, see Chapter "12 Repairs".
Problems in the actuator unit	The pneumatic actuator must be removed	Disconnect the connection to the control pressure. Remove the actuator from the butterfly valve, observe the "Safety instructions and safety measures", see the included actuator unit manuals.

### **i** Info

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

## 8.2 Carrying out emergency measures

In the case of a power supply failure, the butterfly valve automatically switches to the preset fail-safe position, (see "Fail-safe positions" in Chapter "3 Design and principle of operation").

The system operator is responsible for emergency measures.

### In case of a butterfly valve fault:

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

### Recommissioning after faults

See Chapter "6 Commissioning".

## 9 Servicing

The work described in this chapter may only be performed by specialist personnel qualified to perform the corresponding task. The following documents may also be required for the maintenance of the butterfly valve:

- Installation and operating manual for the installed actuator, e.g. ▶ EB 30a for diaphragm rotary actuators BR 30a, ▶ EB 31a for rotary actuators BR 31a or the corresponding actuator documentation of other manufacturers.

### **! WARNING**

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

Valve components and pipes can become very hot or very cold during operation and cause burns upon contact.

- ⇒ Let the components and pipes cool down or warm up.
- ⇒ Wear protective garments and protective gloves.

#### **Danger of injury due to pressurised components and escaping medium!**

- ⇒ Do not loosen the screw of an optional test connection while the butterfly valve is pressurised.

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

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

#### **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 and, if necessary, hearing protection when working near valves.

#### **Danger of injury due to preloaded springs!**

Actuators with preloaded actuator springs are pressurised.

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

#### **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).

- ⇒ Wear protective garments, protective gloves and eye protection.

### **! NOTE**

#### **Damage to the butterfly valve 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.

- ⇒ Observe the tightening torques, see Chapter "15.1.1 Tightening torques".

#### **Damage to the butterfly valve due to unsuitable tools!**

- ⇒ Only use tools approved by PFEIFFER, see Chapter "15.1.3 Tools".

#### **Damage to the butterfly valve due to unsuitable lubricants!**

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

### **i Info**

#### **The butterfly valve was checked by PFEIFFER prior to delivery.**

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

## 9.1 Periodic tests

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

Test	Measures in the case of a negative test result
If present, check the optional test connection for tightness. <b>WARNING!</b> Danger of injury due to pressurised components and escaping medium! Do not loosen the test connection while the butterfly valve is pressurised.	Decommission the butterfly valve, see chapter "10 Decommissioning". Contact the After Sales Service at PFEIFFER for repairs, See chapter "12 Repairs".
Check the control shaft sealing for tightness from the outside.	The control shaft sealing with a PTFE V-ring packing is preloaded with a disc spring set and is therefore maintenance free.

Test	Measures in the case of a negative test result
Check the rotary movement of the actuator- and control shaft for smooth movement.	Tighten the packing correctly. If the actuator- and control shaft are blocked, remove the blockage. <b>WARNING!</b> If the actuator- and control shaft are blocked (e.g. due to "seizure" if not actuated for a long period of time) they can release unexpectedly and move uncontrolled. This can lead to crushing if reaching into them. Before trying to release a blockage of the actuator- and control shaft, interrupt and lock the pneumatic energy and the control signal. Release the residual energy of the actuator (spring tension or compressed air reservoir) before releasing the blockage, see the corresponding actuator documentation.
If possible, check the fail-safe position of the butterfly valve by briefly interrupting the power supply.	Decommission the butterfly valve, see chapter "10 Decommissioning". Then determine the cause and remedy it, see Chapter "8 Malfunctions".
Check pipe connections and seals of the butterfly valve and actuator for leaks.	Regular maintenance work on the butterfly valve is not necessary, but when checking the pipe section, no medium may escape from the flange and screw connections of the body or from the control shaft sealing.

## 9.3 Ordering spare parts and consumables

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

### Spare parts

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

## 9.2 Maintenance work

- ⇒ The butterfly valve must be prepared before all maintenance work, see Chapter "12 Repairs".
- ⇒ After all maintenance work, the butterfly valve must be checked prior to recommissioning, see Chapter "5.5 Checking the mounted butterfly valve".

### 9.2.1 Replacing the seat ring

- ⇒ Check the condition of the seat ring.
- ⇒ Remove the seat ring (14) as described in Chapter "12.2 Replacing the seat ring".
- ⇒ Check the seat ring as well as all plastic parts for damage and if in doubt replace them.

### 9.2.2 Replace seat ring and valve disc ring

- ⇒ Check the condition of the valve disc ring seat ring.
- ⇒ Remove the seat ring (14) and valve disc ring as described in Chapter "12.3 Replacing the seat ring and the valve disc ring".
- ⇒ Check the seat ring and the valve disc ring as well as all plastic parts for damage and if in doubt replace them.

## 10 Decommissioning

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

### WARNING

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

Valve components and pipes can become very hot or very cold during operation and cause burns upon contact.

- ⇒ Let the components and pipes cool down or warm up.
- ⇒ Wear protective garments and protective gloves.

#### **Danger of injury due to pressurised components and escaping medium!**

- ⇒ Do not loosen the screw of an optional test connection while the butterfly valve is pressurised.

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

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

#### **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 and, if necessary, hearing protection when working near valves.

#### **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).

- ⇒ Wear protective garments, protective gloves and eye protection.
- ⇒ Do not loosen the screw of an optional test connection while the butterfly valve is pressurised.

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

- ⇒ Close the valves upstream and downstream of the butterfly valve so that no medium flows through the butterfly valve.
- ⇒ Empty the pipe and butterfly valve completely.
- ⇒ Shut off the pneumatic power and lock it, to depressurise the butterfly valve.
- ⇒ 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.

### WARNING

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

Valve components and pipes can become very hot or very cold during operation and cause burns upon contact.

- ⇒ Let the components and pipes cool down or warm up.
- ⇒ Wear protective garments and protective gloves.

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

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

#### **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).

- ⇒ Wear protective garments, protective gloves and eye protection.
- ⇒ Do not loosen the screw of an optional test connection while the butterfly valve is pressurised.

#### **Danger of injury due to preloaded springs!**

Actuators with preloaded actuator springs are pressurised.

- ⇒ Before working on the actuator, release the compression from the preloaded springs.

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

- The butterfly valve is decommissioned, see chapter "10 Decommissioning".

### 11.1 Removing the butterfly valve from the pipe

- ⇒ Loosen the flange connection.
- ⇒ Remove the butterfly valve from the pipe, see Chapter "4.3 Transporting and lifting the butterfly valve".

### WARNING

#### **If a used valve is sent to PFEIFFER for service:**

The valves must be decontaminated properly in advance.

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

### Tip

- PFEIFFER recommends documenting the following contamination data in the form ► FM 8.7-6 "Declaration regarding the contamination of PFEIFFER valves and components".
- This form is available at ► [www.pfeiffer-armaturen.com](http://www.pfeiffer-armaturen.com).

## 11.2 Disassembling the actuator

See the corresponding actuator documentation.



## 12 Repairs

If the operation of the BR 14p - Typ PSA butterfly 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 butterfly valve due to improper maintenance and repair!**

- ⇒ Do not perform maintenance and repair work on your own.
- ⇒ Contact the After Sales Service at PFEIFFER for maintenance and repair work.

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

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

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

### 12.1 Replacing the V-ring packing

If a leak is found in the stuffing box (8), the PTFE rings of the V-ring packing (15) could be defective.

- ⇒ Check the condition of the packing.

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

- ⇒ Place the butterfly valve on an even and clean work surface so that the packing space is easy to reach.
- ⇒ Loosen the screws (27) and remove the stuffing box flange (8) carefully.
- ⇒ Remove the disc springs from the disc spring set (13).
- ⇒ Remove the V-ring packing (15).
- ⇒ Check the PTFE rings of the V-ring packing as well as all plastic and graphite parts for damage and, in the case of doubt, replace them.
- ⇒ Assemble the butterfly valve as described in Chapter "3.5 Butterfly valve assembly".

### 12.2 Replacing the seat ring

If a leak is found in the passage of the butterfly valve, the seat ring (14) could be defective.

- ⇒ Check the condition of the seat ring.

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

- ⇒ Place the butterfly valve on an even and clean work surface so that the seat ring is easy to reach.
- ⇒ Loosen the screws (24) and remove the fastening ring (9).
- ⇒ Remove the seat ring (14).
- ⇒ Check the seat ring as well as all plastic and graphite parts for damage and, in the case of doubt, replace them.

### **i** Info

*It is essential to pay attention to cleanliness during assembly.*

- ⇒ Assemble the valve as described in Chapter "3.5 Butterfly valve assembly".

#### 12.2.1 Replacing the seat ring in butterfly valves from DN 400 (NPS16)

- ⇒ Place the butterfly valve on an even and clean work surface so that the seat ring is easy to reach.
- ⇒ Loosen the screws (26) and disassemble the fastening ring (5).
- ⇒ Remove the PTFE seat ring (4) or the metal seat ring including the corresponding graphite rings (4).
- ⇒ Check the seat ring as well as all plastic and graphite parts for damage and, in the case of doubt, replace them.

### **i** Info

*It is essential to pay attention to cleanliness during assembly.*

- ⇒ Assemble the valve as described in Chapter "3.5 Butterfly valve assembly".

### 12.3 Replacing the seat ring and the valve disc ring

If a leak is found in the passage of the butterfly valve, the valve disc ring (5) may also be defective in addition to the seat ring (14).

- ⇒ Check the condition of the seat ring and the valve disc ring.
- Disassemble the butterfly valve to remove these components. For this purpose, observe Chapter "1 Safety instructions and safety measures".
- ⇒ Remove the seat ring (14) as described in chapter "12.2 Replacing the seat ring". Check the seat ring and all plastic parts for damage and replace if necessary.
  - ⇒ Loosen the screws (25) and carefully remove the valve disc ring (5). Check the valve disc ring and all plastic parts for damage and replace if necessary.

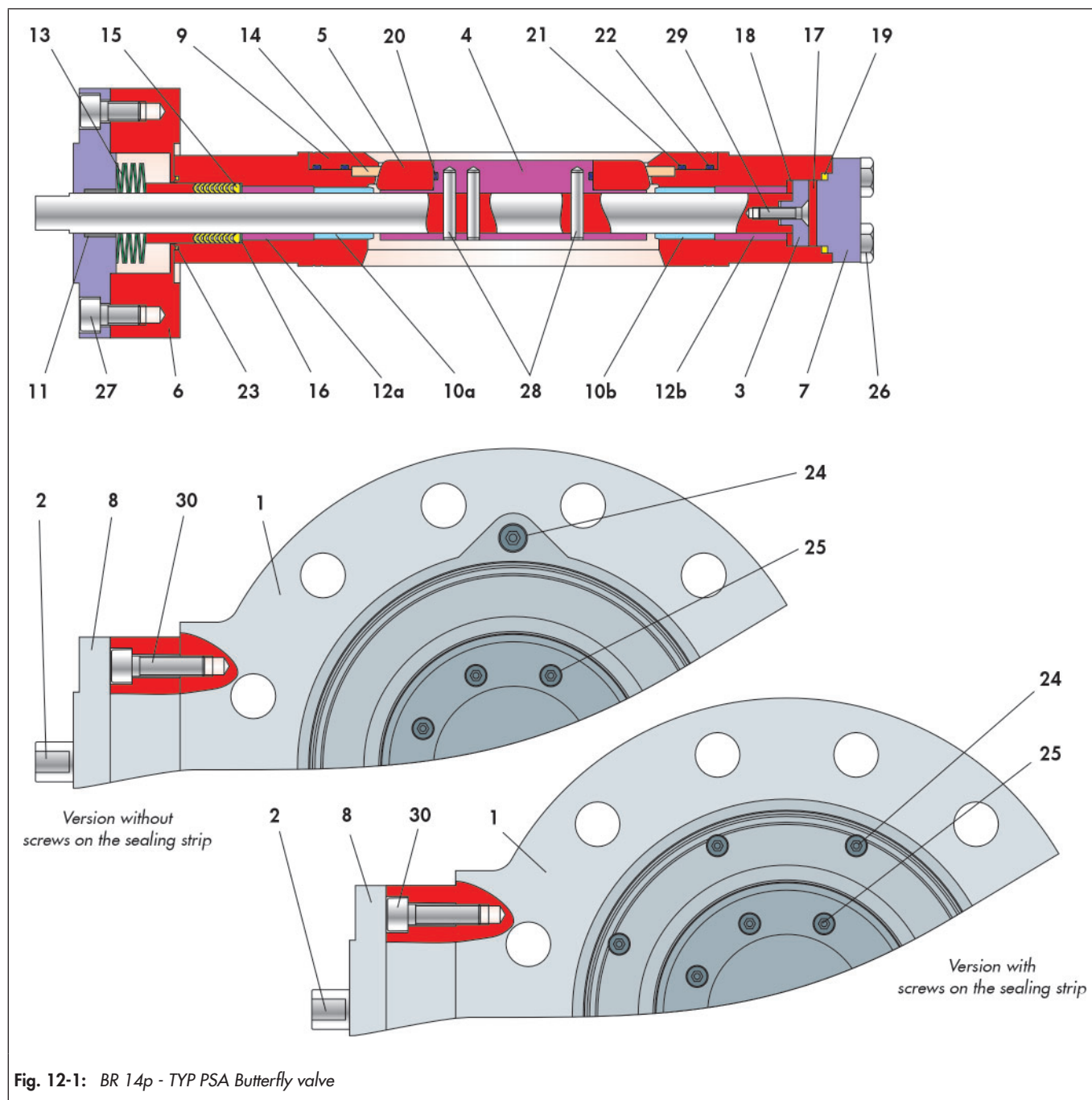


Fig. 12-1: BR 14p - TYP PSA Butterfly valve

Table 12-4: List of parts

Item	Description	Item	Description	Item	Description
1	Valve body	11	Bearing bush	21	O-ring
2	Control shaft	12	Distance bush	22	O-ring
3	Shaft head	13	Disc spring set	23	Ring
4	Valve disc	14	Seat ring	24	Screw
5	Valve disc ring	15	V-ring packing	25	Screw
6	Intermediate flange	16	Disc	26	Screw
7	Bonnet	17	Disc	27	Screw
8	Stuffing box flange	18	Disc	28	Grooved pin
9	Fastening ring	19	Ring	29	Screw
10	Bearing bush	20	O-ring	30	Screw

## 12.4 Disconnecting the valve disc/valve shaft connection

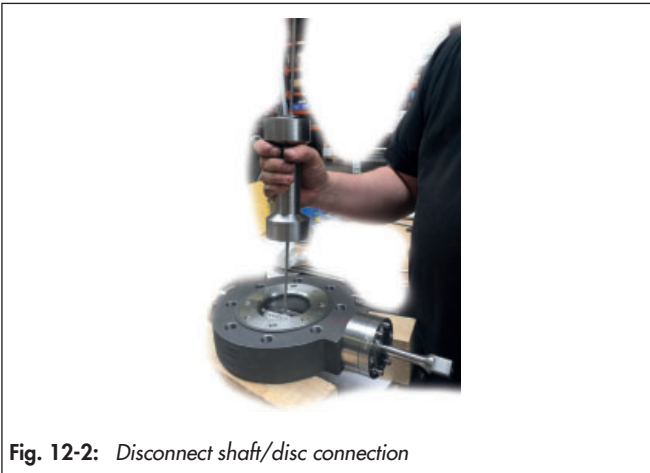


Fig. 12-2: Disconnect shaft/disc connection

### **i** Info

In order to check the packing (15), the bearing bushes (46 and 47) or other plastic parts and replace them if necessary, it may be necessary to disconnect the connection between the valve disc (4) and the control shaft (2).

- ⇒ Drill out the grooved pins (28) for disconnecting the connection between the valve disc (4) and valve shaft (2) and cut a suitable internal thread.
- ⇒ Pull the grooved pins (28) using a slide hammer, see Fig. 12-1.
- ⇒ Alternatively, drill out the grooved pins (28)

## 12.5 Additional repairs

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

## 12.6 Sending devices to PFEIFFER

Defective butterfly valves can be sent to PFEIFFER for repair.

Proceed as follows to send devices:

### **!** WARNING

#### **Danger due to contaminated valves!**

- ⇒ When returning a used valve to PFEIFFER for service, decontaminate the valve properly in advance.
- ⇒ When returning a used valve, include the safety data sheet for the medium as well as confirmation of decontamination of the valve. Otherwise the valve will not be accepted.

### **💡** Tip

- PFEIFFER recommends documenting the following contamination data in the form ► FM 8.7-6 "Declaration regarding the contamination of PFEIFFER valves and components".
- This form is available at ► [www.pfeiffer-armaturen.com](http://www.pfeiffer-armaturen.com).

⇒ Include the following information for returns:

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



## 13 Disposal

- ⇒ For disposal, observe the local, national and international regulations.
- ⇒ Do not dispose of old components, lubricant and hazardous materials with domestic waste.





## 14 Certificates

The declaration of conformity is available on the following pages:

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

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

# DECLARATION OF CONFORMITY

As per Pressure Equipment Directive 2014/68/EU  
TRANSLATION



The manufacturer	<b>PFEIFFER Chemie-Armaturenbau GmbH</b> , D47906 Kempen, Germany
declares that:	<b>Type 14p Butterfly valves (BR 14p) with packing and adjustable stuffing box</b> <ul style="list-style-type: none"> <li>• with pneumatic/ electric/ hydraulic actuator</li> <li>• with free shaft end for subsequent mounting of an actuator</li> </ul>
<p>1. The valves are pressure accessories within the meaning of the <b>Pressure Equipment Directive 2014/68/EU</b> and conform with the requirements of this Directive.</p> <p>2. They may only be operated observing the Installation and operating instructions ► EB 14p or ► EB 14p-.. delivered together with the valve.</p> <p>The commissioning of these valves is only permitted after the valve has been installed from both sides in the pipeline and a risk of injury can be ruled out. (See ► EB 14p or ► EB 14p-.., Chapter 1 for butterfly valves intended for dead-end service)</p>	

*Applied standards:*

<b>EN 593</b> <b>AD 2000 Regulations</b>	Product standard for butterfly valves Regulations for pressurized valve body parts
---------------------------------------------	---------------------------------------------------------------------------------------

*Type designation and technical features:*

PFEIFFER Data sheets ► TB 14p <i>NOTE: This Manufacturer's Declaration applies to all valve types listed in this catalogue.</i>
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*Applied conformity assessment procedure:*

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

*Name of notified body:*

*Identification number of the notified body:*

<b>TÜV Rheinland Service GmbH</b> Am Grauen Stein 51101 Köln Germany	0035
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These Declarations become invalid when modifications are made to the shut-off butterfly valves and/or assemblies that affect the technical data of the shut-off butterfly valve or the <Intended use> described in ► EB 14p or ► EB 14p-.., Chapter 1 of the operating instructions, and considerably change the valve or an assembly delivered with it.

Kempen, 1. September 2022

  
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**Stefan Czayka**  
 Head of Quality Management/IMS Representative

# DECLARATION OF CONFORMITY

As per Pressure Equipment Directive 2014/68/EU  
TRANSLATION



The manufacturer	<b>PFEIFFER Chemie-Armaturenbau GmbH</b> , D47906 Kempen, Germany
declares that:	<b>Type 14p Butterfly valves (BR 14p) with packing and adjustable stuffing box</b> <ul style="list-style-type: none"> <li>• with worm gear and handwheel</li> <li>• with lever for 90° operation</li> </ul>
<p>1. The valves are pressure accessories within the meaning of the <b>Pressure Equipment Directive 2014/68/EU</b> and conform with the requirements of this Directive.</p> <p>2. They may only be operated observing the Installation and operating instructions ► EB 14p or ► EB 14p-.. delivered together with the valve.</p> <p>(See ► EB 14p or ► EB 14p-.., Chapter 1 for butterfly valves intended for dead-end service)</p>	

*Applied standards:*

<b>EN 593</b> <b>AD 2000 Regulations</b>	Product standard for butterfly valves Regulations for pressurized valve body parts
---------------------------------------------	---------------------------------------------------------------------------------------

*Type designation and technical features:*

PFEIFFER Data sheets ► TB 14p NOTE: This Manufacturer's Declaration applies to all valve types listed in this catalogue.
-----------------------------------------------------------------------------------------------------------------------------

*Applied conformity assessment procedure:*

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


*Name of notified body:*

*Identification number of the notified body:*

<b>TÜV Rheinland Service GmbH</b> Am Grauen Stein 51101 Köln Germany	0035
-------------------------------------------------------------------------------	------

These Declarations become invalid when modifications are made to the shut-off butterfly valves and/or assemblies that affect the technical data of the shut-off butterfly valve or the <Intended use> described in ► EB 14p or ► EB 14p-.., Chapter 1 of the operating instructions, and considerably change the valve or an assembly delivered with it.

Kempen, 1. September 2022

  
 \_\_\_\_\_  
 Stefan Czayka  
 Head of Quality Management/IMS Representative

# EU DECLARATION OF CONFORMITY TRANSLATION



The manufacturer	<b>PFEIFFER Chemie-Armaturenbau GmbH</b> , 47906 Kempen, Germany
declares for the listed products that:	<p><b>Type 14p-Type PSA Control and Shut-off Butterfly Valve (BR14b-Type PSA)</b></p> <ul style="list-style-type: none"> <li>• with a <b>Type 31a Quarter-turn Actuator (BR31a)</b></li> <li>• with a <b>rotary actuator of a different make</b></li> </ul> <p>Prerequisite: the unit was sized and assembled by PFEIFFER Chemie-Armaturenbau GmbH. The serial number on the valve refers to the entire unit.</p>
<p>1. It complies with all applicable requirements stipulated in Machinery Directive 2006/42/EC.</p> <p>2. In the delivered state, the valve with actuator is considered to be final machinery as defined in the above mentioned directive.</p> <p>The start-up of these units is only permitted after the valve has been installed from both sides in the pipeline and a risk of injury can be ruled out as a result.</p>	

*Referenced standards:*

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


*Product description and technical features:*

<p>Tight-closing butterfly valve for aggressive media, particularly for strict requirements in chemical applications, automated with a single or double-acting piston actuator for butterfly valves, ball valves and other valves with rotating throttle bodies.</p> <p>For product descriptions refer to:                  PFEIFFER data sheet for Type 14p-Type PSA Valve ▶ TB 14p                  PFEIFFER data sheet for Type 31a Actuator ▶ TB 31a                  PFEIFFER mounting and operating instructions for Type 14p-Type PSA Valve ▶ EB 14p                  PFEIFFER mounting and operating instructions for Type 31a Actuator ▶ EB 31a                  PFEIFFER safety manual for Type 14p-Type PSA Valve ▶ SH 14                  PFEIFFER safety manual for Type 31a Actuator ▶ SH 31a</p> <p>Valve accessories (e.g. positioners, limit switches, solenoid valves, lock-up valves, supply pressure regulators, volume boosters and quick exhaust valves) are classified as machinery components and do not fall within the scope of the Machinery Directive as specified in § 35 and § 46 of the Guide to Application of the Machinery Directive 2006/42/EC issued by the European Commission.</p>
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This declaration becomes invalid when modifications are made to the butterfly valves and/or assemblies that affect the technical data of the control valve or the intended use (▶ EB 14p, section 1) and considerably change the valve or an assembly delivered with it.

Persons authorized to compile the technical file:

Kempen, 28 May 2021

  
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**Stefan Czayka**  
 Head of Quality Management/IMS Representative

# DECLARATION OF CONFORMITY

## TRANSLATION



The manufacturer	PFEIFFER Chemie-Armaturenbau GmbH, 47906 Kempen, Germany
declares for the listed products that:	Type 14p Control and Shut-off Butterfly Valve (Type 14p) <ul style="list-style-type: none"> <li>• with free shaft end</li> </ul>
<p>1. In the delivered state, the valve prepared for mounting on a rotary actuator (not a clearly defined actuator system) is considered to be partly completed machinery as defined in the Machinery Directive 2006/42/EC.</p> <p>Machinery is considered to be partly completed machinery when the machinery manufacturer has not determined all required specifications such as model type, thrusts, torques etc.</p> <p>The start-up of these units is only permitted after the valve has been installed from both sides in the pipeline and a risk of injury can be ruled out as a result.</p>	

### Referenced standards:

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

### Product description and technical features:

Tight-closing butterfly valve for aggressive media, particularly for strict requirements in chemical applications.

For product descriptions refer to:  
PFEIFFER Data Sheet for Type 14p Butterfly Valve ▶ TB 14p  
PFEIFFER Mounting and Operating Instructions for Type 14p Butterfly Valve ▶ EB 14p

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

This declaration becomes invalid when modifications are made to the butterfly valves and/or assemblies that affect the technical data of the butterfly valve or the intended use (▶ EB 14p, section 1) and considerably change the valve or an assembly delivered with it.

Persons authorized to compile the technical file:

Kempen, 22 November 2021


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Stefan Czayka  
Head of Quality Management/IMS Representative



## 15 Annex

### 15.1 Tightening torques, lubricant and tools

#### 15.1.1 Tightening torques

##### **i** Info

<sup>1)</sup> The tightening torques stated in the tables can only be understood as very rough and non-binding guide values and refer to a coefficient of friction of 0.2 $\mu$ . Lubricating the threads leads to indeterminate tightening conditions.

##### 15.1.1.1 Stuffing box flange

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

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

Nominal size		Qty.	Thread (27)	Tightening torque <sup>1) 2)</sup>
DN	NPS			
80	3	cl150		
-	3	cl300		
100	4	cl150		
-	4	cl300		
150	6	cl150		
-	6	cl300		
200	8	cl150		
-	8	cl300		
250	10	cl150		
-	10	cl300		
300	12	cl150		
-	12	cl300		
350	14	cl150		
-	14	cl300		
400	16	cl150		
-	16	cl300		

<sup>2)</sup> Tighten the stuffing box flange screws until the bushing lies on the dome.

##### 15.1.1.2 Intermediate flange

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

**Table 15-2:** Intermediate flange tightening torques

Nominal size		Qty.	Thread (30)	Tightening torque <sup>1)</sup>
DN	NPS			
80	3	cl150		
-	3	cl300		
100	4	cl150		
-	4	cl300		
150	6	cl150		
-	6	cl300		
200	8	cl150		
-	8	cl300		
250	10	cl150		
-	10	cl300		
300	12	cl150		
-	12	cl300		
350	14	cl150		
-	14	cl300		
400	16	cl150		
-	16	cl300		

##### 15.1.1.3 Bonnet

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

**Table 15-3:** Bonnet tightening torques

Nominal size		Qty.	Thread (26)	Tightening torque <sup>1)</sup>
DN	NPS			
80	3	cl150		
-	3	cl300		
100	4	cl150		
-	4	cl300		
150	6	cl150		
-	6	cl300		
200	8	cl150		
-	8	cl300		
250	10	cl150		
-	10	cl300		
300	12	cl150		
-	12	cl300		
350	14	cl150		
-	14	cl300		
400	16	cl150		
-	16	cl300		

### 15.1.1.4 Valve disc ring

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

**Table 15-4:** Valve disc ring tightening torques

Nominal size			Qty.	Thread (25)	Tightening torque <sup>1)</sup>
DN	NPS				
80	3	d150			
-	3	d300			
100	4	d150			
-	4	d300			
150	6	d150			
-	6	d300			
200	8	d150			
-	8	d300			
250	10	d150			
-	10	d300			
300	12	d150			
-	12	d300			
350	14	d150			
-	14	d300			
400	16	d150			
-	16	d300			

### 15.1.1.5 Fastening ring

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

**Table 15-5:** Fastening ring tightening torques

Nominal size			Qty.	Thread (24)	Tightening torque <sup>1)</sup>
DN	NPS				
80	3	d150			
-	3	d300			
100	4	d150			
-	4	d300			
150	6	d150			
-	6	d300			
200	8	d150			
-	8	d300			
250	10	d150			
-	10	d300			
300	12	d150			
-	12	d300			
350	14	d150			
-	14	d300			
400	16	d150			
-	16	d300			

### 15.1.1.6 Flange connections

#### **i** Info

Required tightening torques for assembly for flanges according to DIN EN 1092-1 type 11 and connecting elements (e.g. screws, threaded pins) made of 25CrMo4 / A2-70 or a comparable strength.

The values are taken from the "Guidelines for assembly of flange connections in processing plants" of the VCI (Verband der Chemischen Industrie e.V.).

**Table 15-6:** Required tightening torques

DN [mm]	PN [bar]	Thread	Tightening torques [Nm] for sealing units <sup>3)</sup>		Tightening method <sup>6)</sup>			
			A	B				
80	10	M16	125 <sup>4)</sup>	80	I			
	16							
	25							
	40							
100	10	M16	125 <sup>4)</sup>	80				
	16							
	25					M20	240 <sup>5)</sup>	150
	40							
150	10	M20	240 <sup>5)</sup>	150				
	16							
	25					M24	340	200
	40							
200	10	M20	240 <sup>5)</sup>	150	I			
	16							
	25				M24	340	200	
	40							M27
250	10	M20	240 <sup>5)</sup>	150	I			
	16							
	25				M27	500	250	
	40							
300	10	M20	240 <sup>5)</sup>	150	I			
	16							
	25				M27	500	250	
	40							M30
350	10	M20	240 <sup>5)</sup>	150	II			
	16							
	25					M30	700	300
	40							
400	10	M24	340	200				
	16							
	25					M33	900	500
	40							

<sup>3)</sup> These tightening torques were calculated by the company BASF SE and confirmed by partner companies.

<sup>4)</sup> Recommended lever length 300 mm.

<sup>5)</sup> Recommended lever length 550 mm.

<sup>6)</sup> I) With manually-operated spanner with a suitable extension if necessary.

II) With a torque wrench or other torque-controlled procedure.



**Table 15-7: Sealing unit A**

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

**Table 15-8: Sealing unit B**

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

## 15.1.2 Lubricant

**Table 15-9: Recommended lubricant**

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

## 15.1.3 Tools

### Recommended tools

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

## 15.2 Spare parts

PFEIFFER recommends spare part sets for "Commissioning" and for "2-year operation", see Chapter "15.2.1 Spare parts for BR 14p - type PSA butterfly valve.

### 15.2.3.1 Spare parts for BR 14p - type PSA butterfly valve

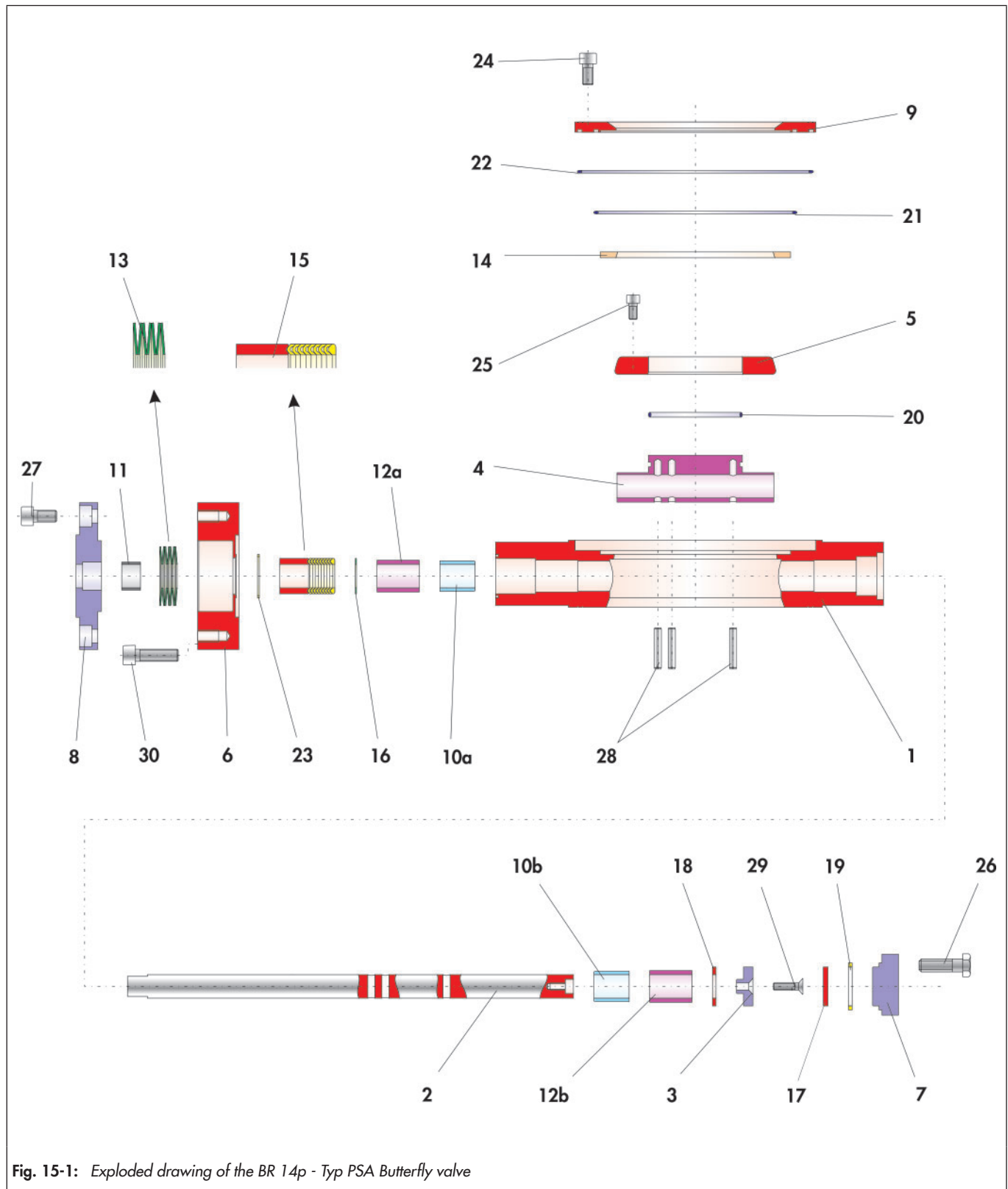


Fig. 15-1: Exploded drawing of the BR 14p - Typ PSA Butterfly valve

Table 15-10: Recommended spare parts for the BR 14p - type PSA butterfly valve

Item	Description	Material		Spare parts kit	
		DIN	ANSI	commissioning	2 year operation
1	Valve body	1.0619 1.4408	A216 WCB A351 CF8M		
2	Control shaft	1.4542 1,4542-H1150	(AISI 630 A564 Typ 630 P930		•
3	Shaft head	1.4542 1.4542-H1150	AISI 630 A564 Typ 630 P930		•
4	Valve disc	1.0619 1.4408	A216 WCB A351 CF8M		•
5	Valve disc ring	1.4571	A479 F316Ti		•
6	Intermediate flange	1.4571	A479 F316Ti		
7	Bonnet	1.4571	A479 F316Ti		
8	Stuffing box flange	1.4571	A479 F316Ti		
9	Fastening ring	1.4571 1.4408	A479 F316Ti A351 CF8M		
10	Bearing bush	PTFE		•	•
11	Bearing bush	PTFE mit Kohle		•	•
12	Distance bush	1.4301			
13	Disc spring set	1.8159 / Delta Tone		•	•
14	Seat ring	PTFE		•	•
15	V-ring packing	PTFE / 1.4305		•	•
16	Disc	1.4404			
17	Disc	1.4404			
18	Disc	1.4404			
19	Ring	PTFE		•	•
20	O-ring	Viton		•	•
21	O-ring	Viton		•	•
22	O-ring	Viton		•	•
23	Ring	PTFE		•	•
24	Screw	A4-70			
25	Screw	A4-70			
26	Screw	A4-70			
27	Screw	A4-70			
28	Grooved pin	1.4542 1.4542-H1150	AISI 630 A564 Typ 630 P930		•
29	Screw	A4-70			•
30	Screw	A4-70			

## 15.3 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](mailto:sales-pfeiffer-de@samsongroup.com).

### Necessary data

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

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