

# MOUNTING AND OPERATING INSTRUCTIONS



AND  
EVERYTHING  
FLOWS

## EB 14b

Translation of the original manual



## Control and shut-off valve BR 14b and BR 14c DIN and ANSI version to combine with actuators

June 2025 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



*Hazardous situations that lead to death or serious injuries*

---



*Situations that can lead to death or serious injuries*

---



*Property damage and malfunctions*

---



*Additional information*

---



*Recommended action*

---

## Content

<b>1</b>	<b>Safety instructions and safety measures</b>	<b>1-1</b>
1.1	Intended use	1-1
1.2	Notes regarding possible severe personnel injury	1-2
1.3	Notes regarding possible personnel injury	1-2
1.4	Notes regarding possible property damage	1-4
1.5	Warning notes on the device	1-4
<b>2</b>	<b>Markings on the device</b>	<b>2-1</b>
2.1	Type Plates	2-2
2.1.1	Butterfly valve type plate	2-2
2.1.2	Actuator type plate	2-2
2.2	Material marking	2-2
2.3	Electronic type plate	2-2
2.3.1	Type plate with QR-Code	2-2
2.3.2	Marking location of the electronic type plate	2-3
2.4	Turning direction notice sign	2-3
2.5	TA-Luft licence plate	2-3
2.5.1	TA-Luft stamp	2-3
<b>3</b>	<b>Design and principle of operation</b>	<b>3-1</b>
3.1	Variants	3-1
3.2	Additional fittings	3-2
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 BR 14b (Type WTD and MTD)	3-2
3.5.2	Assembly of butterfly valve BR 14b (Type WNS)	3-5
3.5.3	Assembly of butterfly valves BR 14c (BR 74b) (Type WTD and MTD)	3-7
3.5.4	Note for installation of actuator elements	3-9
3.6	Assembling the butterfly valves for oxygen	3-9
<b>4</b>	<b>Shipment and on-site transport</b>	<b>4-1</b>
4.1	Packaging and dispatch	4-1
4.1.1	General packaging instructions	4-1
4.1.2	Standard packaging	4-1
4.1.3	Materials	4-1
4.1.4	Packaging for dispatch by truck or air freight	4-1
4.1.5	Packaging for dispatch by sea freight	4-1
4.1.6	Additional service for packaging and dispatch	4-2
4.1.7	Marking	4-2
4.2	Accepting delivery	4-2
4.3	Unpacking the butterfly valve	4-2
4.4	Transporting and lifting the butterfly valve	4-3
4.4.1	Transporting	4-3
4.4.2	Lifting	4-3
4.4.3	Lifting points on the body	4-4
4.4.4	Lifting points on the bracket	4-4
4.5	Storing the butterfly valve	4-5

## Content

<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	5-4
5.5.1	Functional test	5-4
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>
<b>8</b>	<b>Malfunction</b>	<b>8-1</b>
8.1	Detecting and rectifying errors	8-1
8.2	Carrying out emergency measures	8-2
<b>9</b>	<b>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
9.3	Ordering spare parts and consumables	9-2
<b>10</b>	<b>Decommissioning</b>	<b>10-1</b>
<b>11</b>	<b>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</b>	<b>Repairs</b>	<b>12-1</b>
12.1	Replacing the packing	12-1
12.1.1	Replacing the V-ring packing with butterfly valve BR 14b (Type WTD and MTD)	12-1
12.1.2	Replacing the meshwork packing with butterfly valve BR 14b (Type WNS)	12-1
12.1.3	Replacing the V-ring packing with butterfly valve BR 14c (BR 74b) (Type WTD and MTD)	12-1
12.2	Replacing the seat ring	12-3
12.2.1	Replacing the seal ring in butterfly valves up to DN 300 (NPS12)	12-3
12.2.2	Replacing the seat ring in butterfly valves from DN 400 (NPS16)	12-3
12.3	Additional repairs	12-3
12.4	Sending devices to PFEIFFER	12-3
<b>13</b>	<b>Disposal</b>	<b>13-1</b>
<b>14</b>	<b>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 Lubricants	15-4
15.1.3 Tools	15-4
15.2 Spare parts	15-4
15.2.1 Spare parts for butterfly valve BR 14b (Type WTD and MTD)	15-5
15.2.2 Spare parts for butterfly valve BR 14b (Type WNS)	15-6
15.2.3 Spare parts for butterfly valve BR 14c (Type WTD and MTD)	15-7
15.3 Service	15-8



# 1 Safety instructions and safety measures

## 1.1 Intended use

The PFEIFFER butterfly valve BR 14b is manually operated in combination with an actuator for the regulation of the volume flow, pressure and temperature of fluid, gaseous or vaporous media.

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

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

If the operator would like to use the butterfly valve in other applications or environments, they must contact PFEIFFER.

- Manual butterfly valves are only intended for use, after installation in a pipe system, to cut off the media, let it flow through or regulate it within the permitted pressure and temperature limits.
- 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 14b.
- 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.

## 1.2 Notes regarding possible severe personnel injury

### DANGER

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

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

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

#### **Hazards and damage due to unsuitable 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 14b

#### **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).

#### **Danger due to incorrect loosening of an optional adjustable stuffing box!**

*The control shaft is sealed by a stuffing box.*

- ⇒ Before the nuts on the compression spacer are loosened or released, fully release the pressure in the pipe so no medium escapes from the stuffing box.

## 1.3 Notes regarding possible personnel injury

### WARNING

#### **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.

**⚠ 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 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 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 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.

**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.
- ⇒ During reassembly, tighten the screws according to Table 15-1 and Table 15-2 in Chapter "15.1.1 Tightening torques" using a torque wrench.

**⚠ WARNING****Hazards due to incorrect 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.

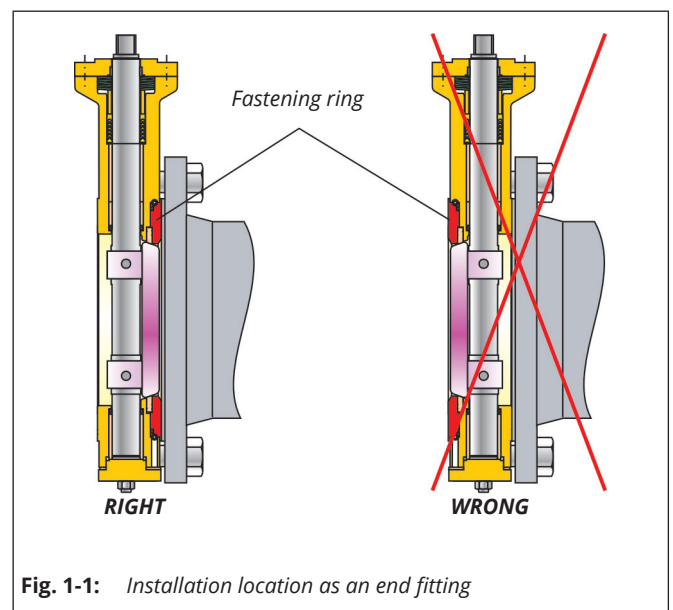


Fig. 1-1: Installation location as an end fitting

## 1.4 Notes regarding possible property damage

### ! NOTE

#### **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 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 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 Table 15-1 and Table 15-2 in 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.

#### **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 seal 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".

### ! NOTE

#### **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".

## 1.5 Warning notes on the device

### Warning of moving parts

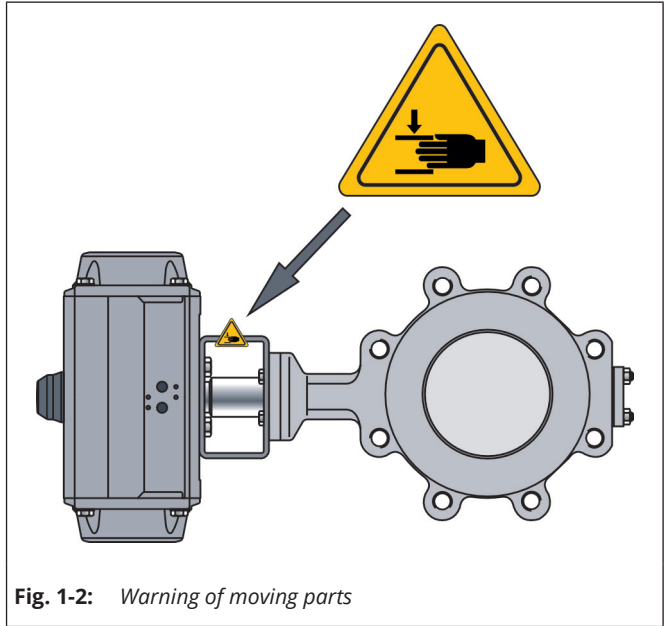


Fig. 1-2: Warning of moving parts

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

## 2 Markings on the device

Each butterfly valve usually has the following marking.

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

Pos.	For	Marking	Remark
1	Manufacturer	PFEIFFER	Address see Chapter "15.3 Service"
2	Valve type	BR (and number value)	e.g. BR 14b = Series 14b, see the PFEIFFER catalogue
3	Body material	e.g. 1.4408	No. of the material standard according to DIN EN 10213-4
4	Size	DN (and number value)	Number value in [mm], e.g. DN 200 / number value in [inches], e.g. NPS8
5	Maximum pressure	PN (and number value)	Number value in [bar] e.g. PN 40 / number value, e.g. cl150 at room temperature
6	Max. permissible operating temperature	TS (and number value)	PS and TS are related values here at the max. permissible operating temperature with the max. permissible operating overpressure, see the Pressure-Temperature Diagram on the data sheet ► TB 14b
	Max. permissible operating pressure	PS (and number value)	
7	Test pressure	PT (and number value)	The test pressure must be observed depending on the device
8	Manufacturer number from 2018	e.g. 351234/001/001	<div> <div>35</div> <div>1234</div> <div>/001</div> <div>/001</div> <div>Valve no. within the item</div> <div>Item in the order</div> <div>Order</div> <div>Year of manufacture (39=2019, 30=2020, 31=2021, 32=2022, 33=2023, 34=2024, 35=2025 etc.)</div> </div>
	Manufacturer number 2009 to 2017	e.g. 211234/001/001	<div> <div>21</div> <div>1234</div> <div>/001</div> <div>/001</div> <div>Valve no. within the item</div> <div>Item in the order</div> <div>Order</div> <div>Year of manufacture (29=2009, 20=2010, 21=2011, 22=2012 etc.)</div> </div>
	Manufacturer number until 2008	e.g. 2071234/001/001	<div> <div>207</div> <div>1234</div> <div>/001</div> <div>/001</div> <div>Valve no. within the item</div> <div>Item in the order</div> <div>Order</div> <div>Year of manufacture (205=2005, 206=2006, 207=2007 etc.)</div> </div>
9	Year of manufacture	e.g. 2018	Upon customer request, the year of manufacture can also be indicated on the valve
10	Seat material	e.g. PTFE/glass	Material marking
11	Shaft material	e.g. 1.4542/H1150	No. of the material standard according to DIN EN 10088-3
12	Test point number	e.g. TEST POINT F123201-1	Test point numbers are specified by the customer
13	Conformity	CE	Conformity is certified separately by Pfeiffer
	Code No.	0035	"Notified body" according to EU Directive = TÜV Rheinland Service GmbH
14	Flow direction	➔	Attention: see the note in Chapter "5.4 Installing the butterfly valve in the pipe"
15	Direction of rotation		Reference to the direction of rotation
16	TA-Luft 2021		Stamp
17	Data/Matrix code		Sticker

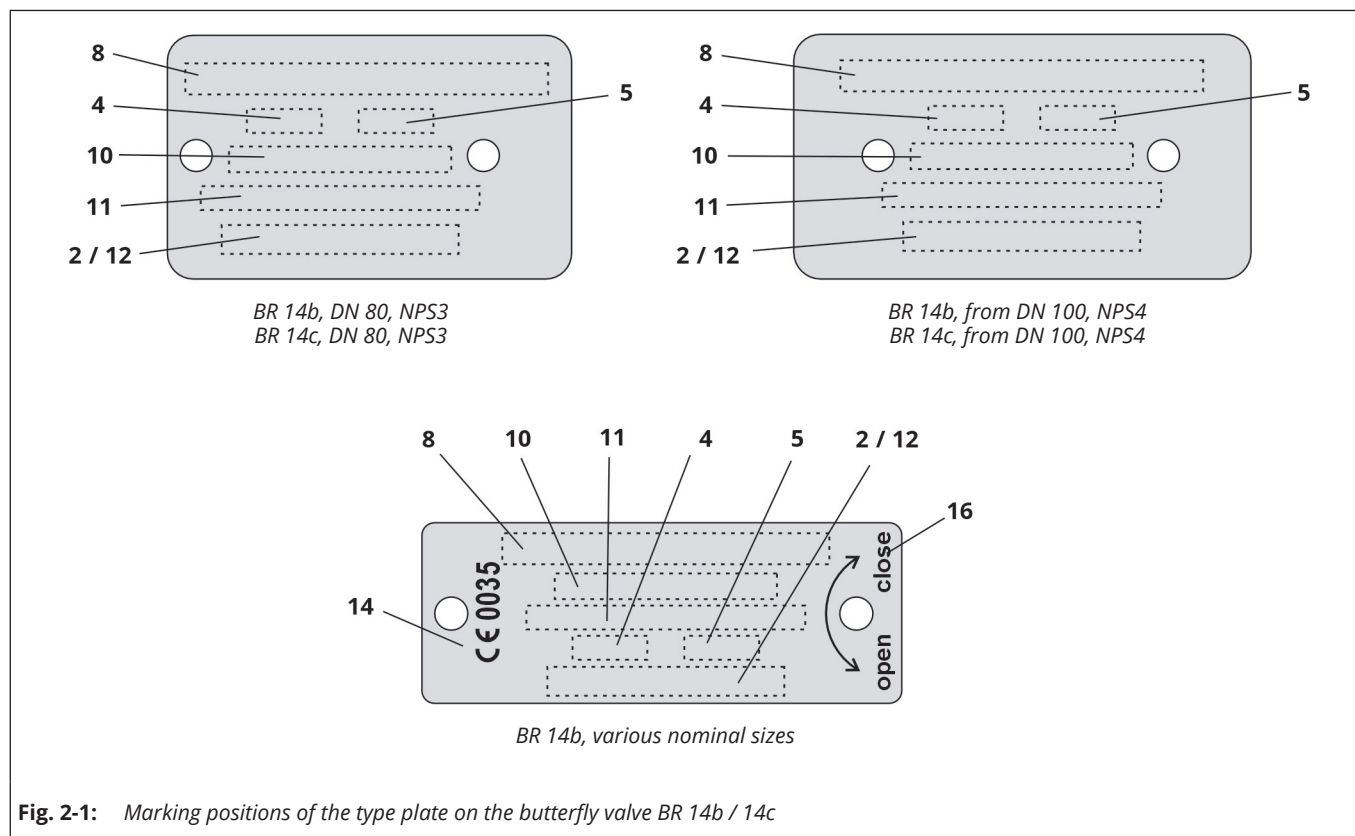
### Info

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



## 2.1 Type Plates

### 2.1.1 Butterfly valve type plate



### 2.1.2 Actuator type plate

See the corresponding actuator documentation.

An appliance-specific website provides comprehensive information about this type plate. To access it, enter the serial number or scan the Data/Matrix code.

## 2.2 Material marking

The valves are marked on the body with material specification, see Table 2-1.

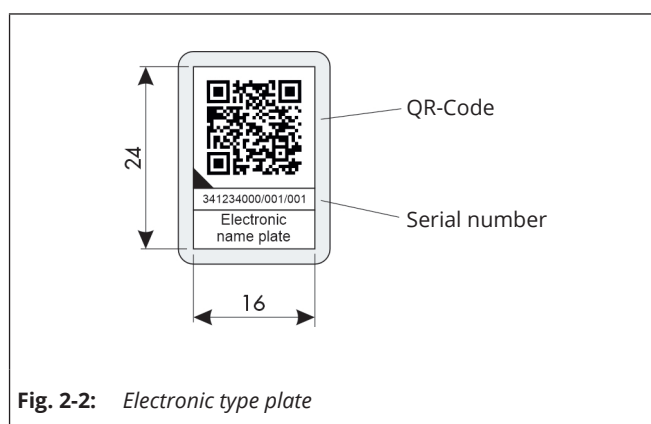
Further specifications can be requested from PFEIFFER.

## 2.3 Electronic type plate

An electronic type plate can be provided on PFEIFFER fittings. The serial number and the Data/Matrix code are the key features of this electronic type plate.

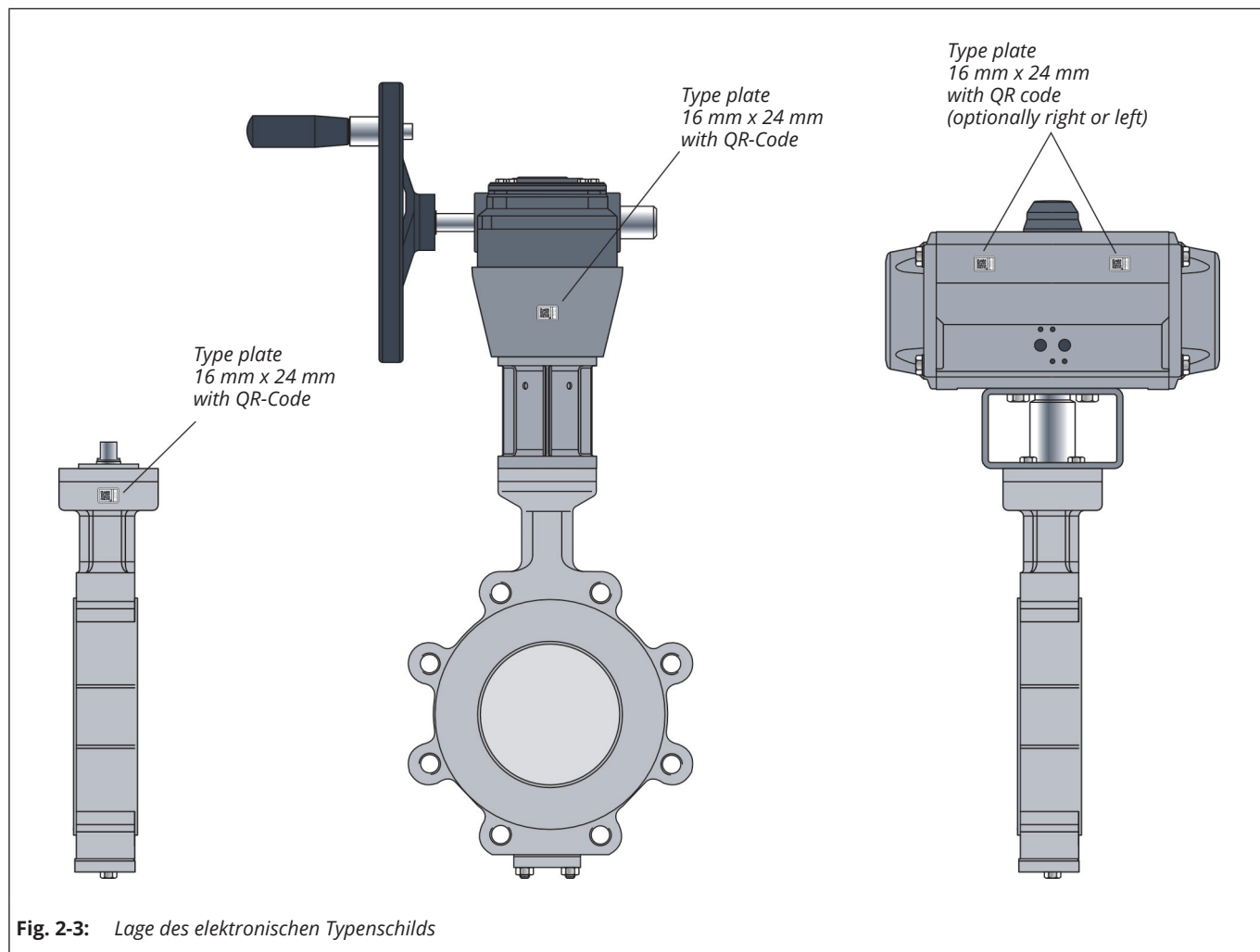
This helps to implement IEC 61406 on SAMSON products.

### 2.3.1 Type plate with QR-Code



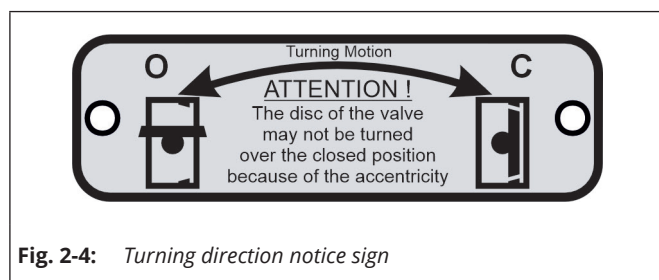


## 2.3.2 Marking location of the electronic type plate



## 2.4 Turning direction notice sign

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

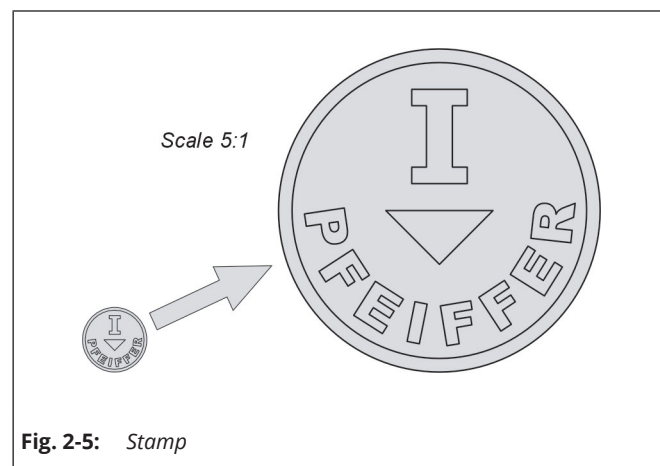


## 2.5 TA-Luft licence plate

PFEIFFER valves can be equipped with packing in accordance with TA-Luft. This serves to implement TA-Luft 2021 for PFEIFFER products.

Valves designed in accordance with TA-Luft are labelled with a stamp on the type plate, see Fig. 2-1 to 2-3.

### 2.5.1 TA-Luft stamp





### 3 Design and principle of operation

#### Version

The 14b / 14c series butterfly valves have the following properties:

- **BR 14b** is a cast butterfly valve.
- **BR 14c (BR 74b)** is a butterfly valve made of solid material.
- **Butterfly valve body** made of steel or non-corroding steel
- **Body version** as a screw-in butterfly valve (lug type) or clamping butterfly valve (wafer type).
- **Valve seals**
  - Type WTD, soft seal with disc spring preloaded V-ring packing.
  - Type MTD, metal seal with disc spring preloaded V-ring packing.
  - Type WNS, soft seal with adjustable stuffing box.

#### Function and principle of operation

The BR 14b butterfly valves can be flowed through in both directions.

The position of the valve disc (3) determines the flow with the area released opposite of the seat ring (4). Butterfly valves are sealed between the valve disc (3) and the seat ring (4).

The control shaft (2) is sealed towards the outside by a packing (9). This packing is maintenance-free PTFE V-ring packing, which is preloaded by disc springs (10) located above the packing space.

Optionally, this packing can be PTFE meshwork packing, which is preloaded by an adjustable stuffing box, or disc spring preloaded graphite packing.

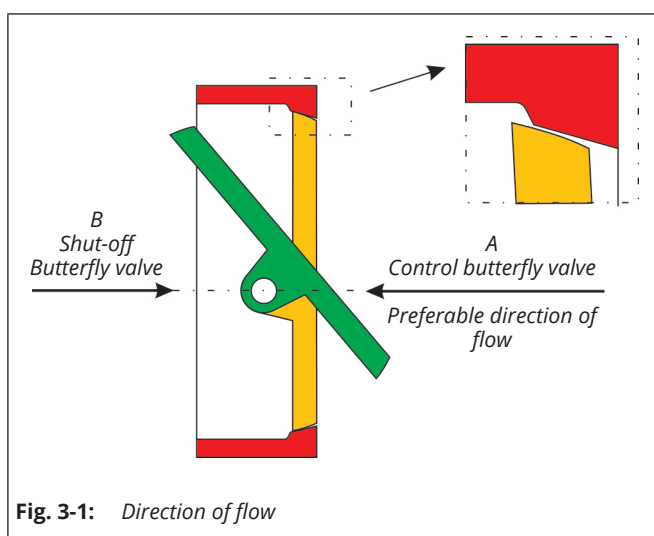


Fig. 3-1: Direction of flow

The direction of flow and the differential pressure determine the breakaway torque for opening the butterfly

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

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

When the medium flows 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 14b butterfly valve can be selected in the following versions:

- With lever and ratchet
- With manual gear
- With diaphragm rotary actuator BR 30a (is currently no longer available)
- With PFEIFFER rotary actuator BR 31a
- With rotary actuators from other manufacturers (for details see the respective data sheet).

#### 3.1 Variants

- Double stuffing box
- Primary sealing with o-ring
- Flange with groove according to DIN EN 1092 (rows 16 and 25 only)
- Special material
- High-temperature version (> 350°C)
- Low-temperature version (-196°C)

## 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:

- Locking device
- Switching shaft extension (100 mm standard)
- Pneumatic or electric rotary actuator
- Positioner (with the control valve option)
- 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".

### Info

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

## 3.5 Butterfly valve assembly

The BR 14b / 14c 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 butterfly valve **BR 14b - Type WTD and MTD**.
- Chapter 3.5.2 describes the assembly of the butterfly valve **BR 14b - Type WNS**.
- Chapter 3.5.3 describes the assembly of the butterfly valve **BR 14c - Type WTD and MTD**.

### 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 incorrect lubricant when installing the butterfly valve!**

PFEIFFER recommends suitable lubricants for the respective areas of application of the butterfly valve, see chapter 15.1.2.

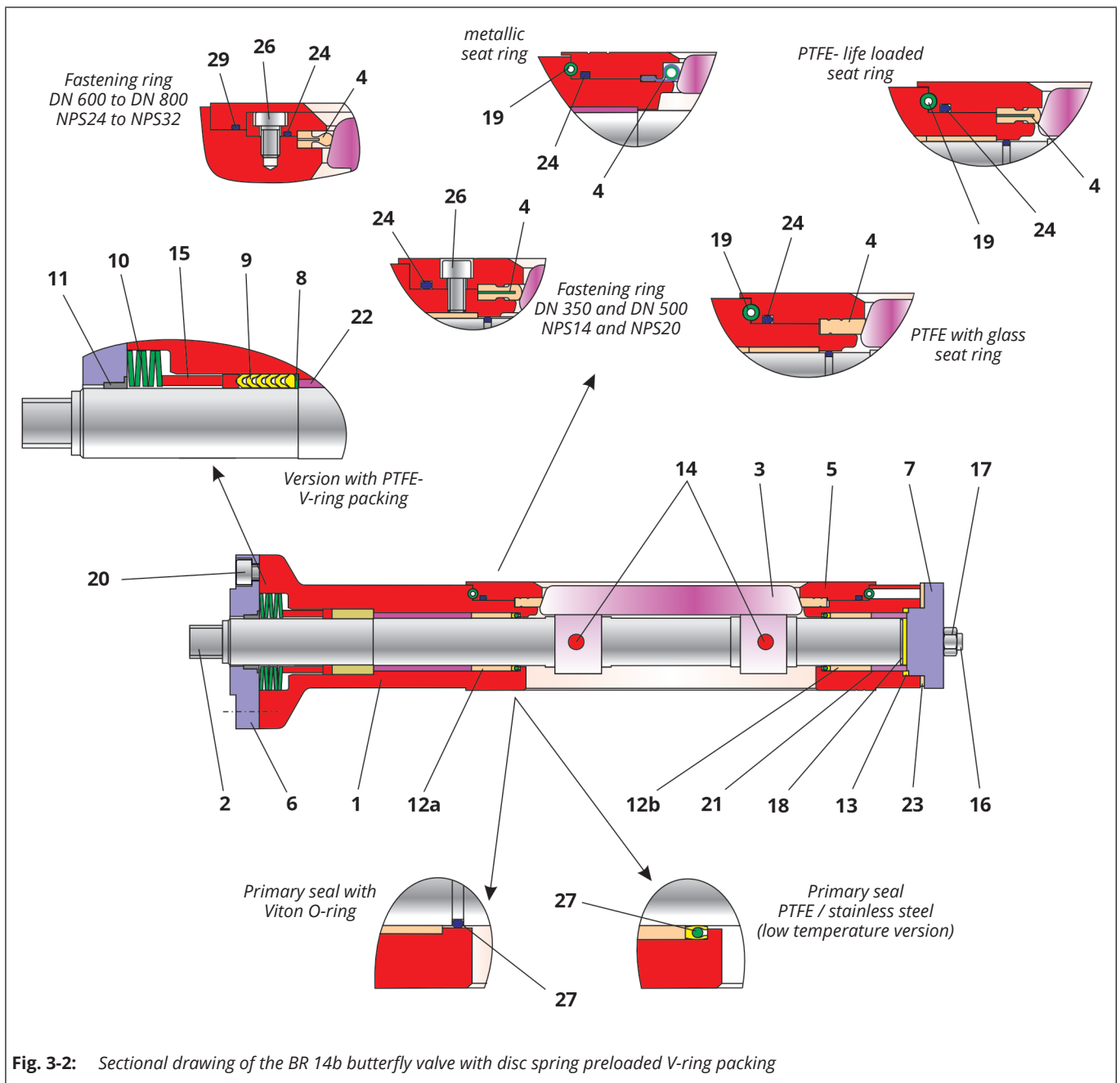
### Info

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

### 3.5.1 Assembly of butterfly valve BR 14b (Type WTD and MTD)

#### 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.
- ⇒ Push the bearing bush (12a) as far as it will go into the bearing bore in the valve body.



**Fig. 3-2:** Sectional drawing of the BR 14b butterfly valve with disc spring preloaded V-ring packing

**Table 3-1:** Parts list for the BR 14b butterfly valve with disc spring preloaded V-ring packing

Item	Description
1	Valve body
2	Control shaft
3	Valve disc
4	Seat ring
	Metal seat ring
5	Fastening ring
6	Stuffing box flange
7	Cover
8	Disc

Item	Description
9	V-ring packing
10	Disc spring set
11	Bearing bush
12	Bearing bush
13	Sealing
14	Grooved pin
15	Thrust ring
16	Stud bolt
17	Nut

Item	Description
18	Disc
19	Tension spring
20	Screw
21	Distance bush
22	Distance bush
23	Cover sealing
24	O-ring
26	Screw
27	Primary sealing

- ⇒ Insert the distance bush (22) into the bearing bore.

### Info

*Fit butterfly valves with a nominal size of DN 300 or NPS12 without a distance bush (22).*

- ⇒ Insert the valve disc (3) into the body such that the bearing bores in the valve disc align with the bearing bore in the valve body.
- ⇒ Insert the control shaft (2) through the bearing bores of the valve body and the valve disc.
- ⇒ Push the bearing bush (12b) over the control shaft as far as it will go into the bearing bore in the valve body.
- ⇒ Afterwards the distance bush (21) is inserted.

### Info

*Fit butterfly valves with a nominal size of DN 100 or NPS4 without a distance bush (21).*

- ⇒ Screw the stud bolts (16) into the valve body.
- ⇒ Insert the Disc (18) into the provided recess in the cover (7).
- ⇒ Push also the cover sealing (23) onto the cover in the same way as the sealing (13).

### Info

*Fit butterfly valves with a nominal size of DN 300 or NPS12 without cover sealing (23).*

- ⇒ Insert the preassembled cover (7) into the bearing bore in the valve body (1) and adjust with the stud bolts (16).
- ⇒ Tighten the cover (7) with the nuts (17) evenly and in a criss-cross pattern.

### Info

*The permissible torque for tightening the cover can be found in Table 15-1 and 15-4 in Chapter "15.1.1 Tightening torques".*

### Version with V-ring packing

- ⇒ Push the disc (8) over the free shaft end into position in the valve body.
- ⇒ Push the PTFE V-ring packing (9) 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.

### Version with M-PTFE wedge ring packing

- ⇒ Ask PFEIFFER about mounting the wedge ring packing.

### Further assembly for all packing designs

- ⇒ Push the thrust ring (15) over the control shaft and press it into position in the valve body.
- ⇒ Insert the disc spring set (10). Refer to the sectional drawing Fig. 3-2 for the arrangement of the disc springs.
- ⇒ Press the bearing bush (11) into the stuffing box flange (6).
- ⇒ Fit the preassembled stuffing box flange (6) smoothly over the body flange and adjust with screws (20).
- ⇒ Tighten the screws (20) evenly in a criss-cross pattern.

### Info

*The permissible torque for tightening the stuffing box flange can be found in Table 15-1 and 15-2 in Chapter "15.1.1 Tightening torques".*

- ⇒ Adjust the dihedron of the control shaft parallel to the valve disc (3) and secure it against further twisting.

### Info

*Press the control shaft up against the disc (18).*

- ⇒ Drill dowel holes for connecting the control shaft (2) and the valve disc (3).
- ⇒ Pin the valve disc and control shaft with close-tolerance grooved pins (14).

### 3.5.1.2 Assembling butterfly valves up to DN 300 (NPS12)

- ⇒ Insert the PTFE seat ring (4) or the metal seat ring including the corresponding graphite rings (4) into the body.

### Info

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

- ⇒ Insert the o-ring (24) into the fastening ring (5).
- ⇒ Place the preassembled fastening ring (5) on the seat ring (4) and press it in with a hydraulic press.
- ⇒ Loosen the cover (7).
- ⇒ Push the tension spring (19) into the slot.
- ⇒ Fasten the cover (7) as previously described.

### 3.5.1.3 Assembling butterfly valves from DN 350 (NPS14)

- ⇒ Insert the PTFE seat ring (4) or the metal seat ring including the corresponding graphite rings (4) into the valve body.

**i Info**

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

- ⇒ Place the fastening ring (5) on the seat ring (4) and adjust with the screws (26).
- ⇒ Tighten the screws evenly in a criss-cross pattern.

**i Info**

*The permissible torque for tightening the fastening ring can be found in Table 15-1 and 15-5 in Chapter "15.1.1 Tightening torques".*

## 3.5.2 Assembly of butterfly valve BR 14b (Type WNS)

### 3.5.2.1 Preassembly of the butterfly valves

- ⇒ Place the valve body (1) on a clean surface at working height so that the bearing area of the control shaft is easy to reach.
- ⇒ Push the bearing bush (12a) as far as it will go into the bearing bore in the valve body.
- ⇒ Insert the distance bush (22) into the bearing bore.

**i Info**

*Fit butterfly valves with a nominal size of DN 300 or NPS12 without a distance bush (22).*

- ⇒ Insert the valve disc (3) into the valve body such that the bearing bores in the valve disc align with the bearing bore in the valve body.
- ⇒ Insert the control shaft (2) through the bearing bores of the valve body and the valve disc.
- ⇒ Push the bearing bush (12b) over the control shaft as far as it will go into the bearing bore in the valve body.
- ⇒ Insert the distance bush (21).

**i Info**

*Fit butterfly valves with a nominal size of DN 100 or NPS4 without a distance bush (21).*

- ⇒ Screw the stud bolts (16) into the valve body.
- ⇒ Insert the disc (18) into the provided recess in the cover (7).
- ⇒ Push also the cover sealing (23) onto the cover in the same way as the sealing (13).

**i Info**

*Fit butterfly valves with a nominal size of DN 300 or NPS12 without cover sealing (23).*

- ⇒ Insert the preassembled cover (7) into the bearing bore in the valve body (1) and adjust with the stud bolts (16).
- ⇒ Tighten the cover (7) with the nuts (17) evenly and in a criss-cross pattern.

**i Info**

*The permissible torque for tightening the cover can be found in Table 15-1 and 15-4 in Chapter "15.1.1 Tightening torques".*

### Version with meshwork packing

- ⇒ Push the disc (8) over the free shaft end into position in the valve body.
- ⇒ Push the PTFE meshwork packing (9) ring by ring over the shaft into the body bore and press in with an assembly sleeve.

### Further assembly for all packing designs

- ⇒ Press the bearing bush (11) into the adjustable stuffing box (6).
- ⇒ Fit the preassembled adjustable stuffing box (6) smoothly over the shaft and adjust with screws (20) and washers (28).
- ⇒ Tighten the screws (20) evenly in a criss-cross pattern.

**i Info**

*The required torques for tightening the adjustable stuffing box can be found in Table 15-3. Torque wrenches must be used to ensure that the torque is reached.*

- ⇒ Adjust the dihedral of the control shaft parallel to the valve disc and secure it against further twisting.

**i Info**

*Press the control shaft up against the disc (18).*

### 3.5.2.2 Assembling butterfly valves up to DN 300 (NPS12)

- ⇒ Insert the seat ring (4) into the body.

**i Info**

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

- ⇒ Insert the o-ring (24) into the fastening ring (5).



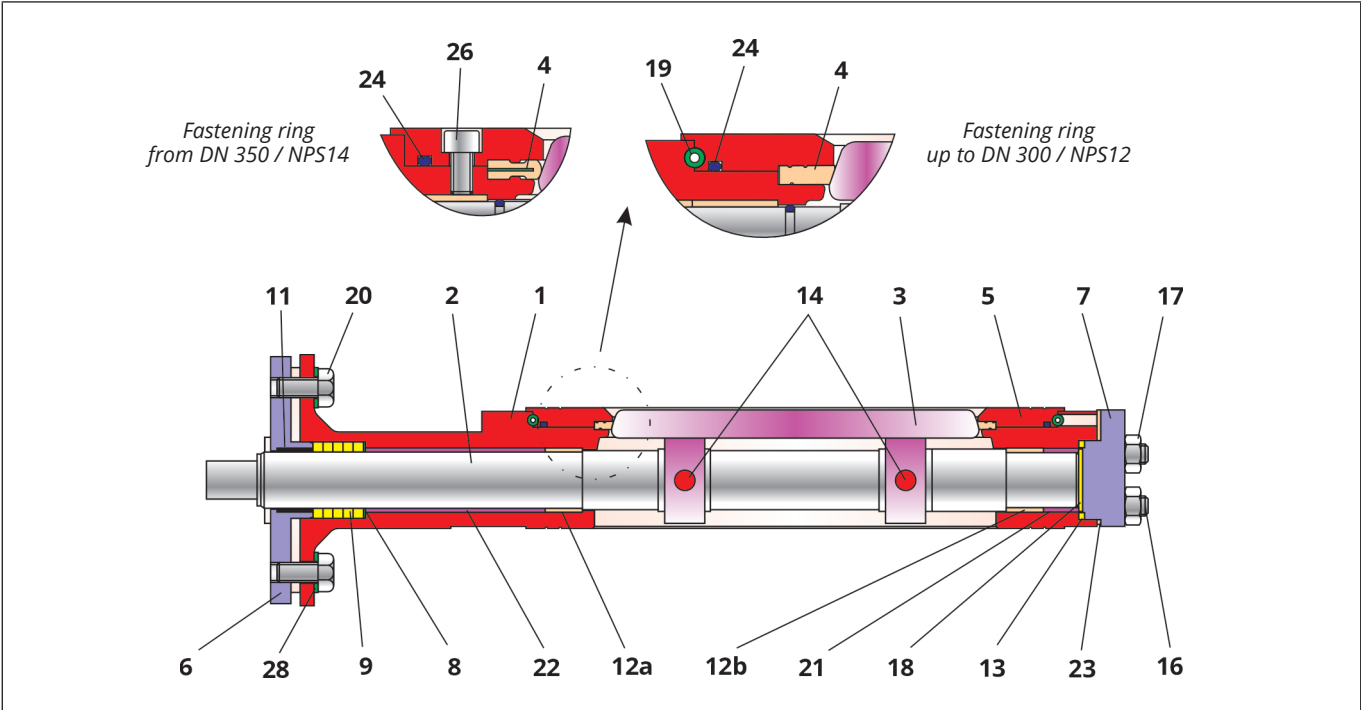


Fig. 3-3: Sectional drawing of the BR 14b butterfly valve with adjustable stuffing box

Table 3-2: Parts list for the BR 14b butterfly valve with adjustable stuffing box

Item	Description	Item	Description	Item	Description
1	Valve body	9	Packing	19	Tension spring
2	Control shaft	11	Bearing bush	20	Screw
3	Valve disc	12	Bearing bush	21	Distance bush
4	Seat ring	13	Sealing	22	Distance bush
5	Fastening ring	14	Grooved pin	23	Cover sealing
6	Adjustable stuffing box	16	Stud bolt	24	O-ring
7	Cover	17	Nut	26	Screw
8	Disc	18	Disc	28	Washer

- ⇒ Place the preassembled fastening ring (5) on the seat ring (4) and press it in with a press.
- ⇒ Loosen the cover (7).
- ⇒ Push the tension spring (19) into the slot.
- ⇒ Fasten the cover as previously described.

- ⇒ Place the fastening ring (5) on the seat ring (4) and adjust with the screws (26).
- ⇒ Tighten the screws (26) evenly in a criss-cross pattern.

**i Info**

The permissible torque for tightening the fastening ring can be found in Table 15-1 and 15-5 in Chapter “15.1.1 Tightening torques”.

3.5.2.3 Assembling butterfly valves from DN 350 (NPS14)

- ⇒ Insert the seat ring (4) into the body.

**i Info**

It is essential to pay attention to cleanliness during assembly.



### 3.5.3 Assembly of butterfly valves BR 14c (BR 74b) (Type WTD and MTD)

#### 3.5.3.1 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.
- ⇒ Push the bearing bush (12a) as far as it will go into the bearing bore in the valve body (1).
- ⇒ Insert the distance bush (22) into the bearing bore.

#### **i** Info

*Fit butterfly valves with a nominal size of DN 300 or NPS12 without a distance bush (22).*

- ⇒ Insert the valve disc (3) into the valve body such that the bearing bores in the valve disc align with the bearing bore in the valve body.
- ⇒ Insert the control shaft (2) through the bearing bores of the valve body and the valve disc.
- ⇒ Push the bearing bush (12b) over the control shaft as far as it will go into the bearing bore in the valve body.
- ⇒ Insert the distance bush (21).
- ⇒ Drill dowel holes for connecting the control shaft (2) and the valve disc (3).
- ⇒ Pin the valve disc and control shaft with close-tolerance grooved pins (14).

#### **i** Info

*Fit butterfly valves with a nominal size of DN 100 or NPS4 without a distance bush (21).*

- ⇒ Screw the stud bolts (16) into the valve body.
- ⇒ Insert the disc (18) into the provided recess in the cover (7).
- ⇒ The cover sealing (23) is also pushed onto the cover in the same way as the sealing (13).

#### **i** Info

*Fit butterfly valves with a nominal size of DN 300 or NPS12 without sealing (23).*

- ⇒ Insert the preassembled cover into the bearing bore in the valve body (1) and adjust with the stud bolts.
- ⇒ Tighten the cover (7) with the nuts (17) evenly and in a criss-cross pattern.

#### **i** Info

*The permissible torque for tightening the cover can be found in Table 15-1 and 15-4 in Chapter "15.1.1 Tightening torques".*

#### Version with V-ring packing

- ⇒ Push the disc (8) over the free shaft end into position in the valve body.
- ⇒ Push the PTFE V-ring packing (9) over the control shaft into the body bore and press in with an assembly sleeve. Refer to the sectional drawing Fig. 3-4 for the arrangement of the V-ring packing.

#### Version with M-PTFE wedge ring packing

- ⇒ Ask PFEIFFER about mounting the wedge ring packing.

#### Further assembly for all packing designs

- ⇒ Place the intermediate flange (25) on the valve body and adjust with screws (30).
- ⇒ Tighten the screws (30) evenly in a criss-cross pattern.

#### **i** Info

*The permissible torque for tightening the cover can be found in Table 15-1 and 15-6 in Chapter "15.1.1 Tightening torques".*

- ⇒ Push the thrust ring (15) over the control valve and press it into position in the valve body.
- ⇒ Insert the disc spring set (10). Refer to the sectional drawing Fig. 3-4 for the arrangement of the disc springs.
- ⇒ Press the bearing bush (11) into the stuffing box flange (6).
- ⇒ Fit the preassembled stuffing box flange smoothly over the intermediate flange and adjust with screws (20).
- ⇒ Tighten the screws (20) evenly in a criss-cross pattern.

#### **i** Info

*The permissible torque for tightening the stuffing box flange can be found in Table 15-1 and 15-2 in Chapter "15.1.1 Tightening torques".*

- ⇒ Adjust the dihedron of the control shaft (2) parallel to the valve disc and secure it against further twisting.

#### **i** Info

*Press the control shaft up against the disc (18).*

- ⇒ Drill dowel holes for connecting the control shaft (2) and the valve disc.

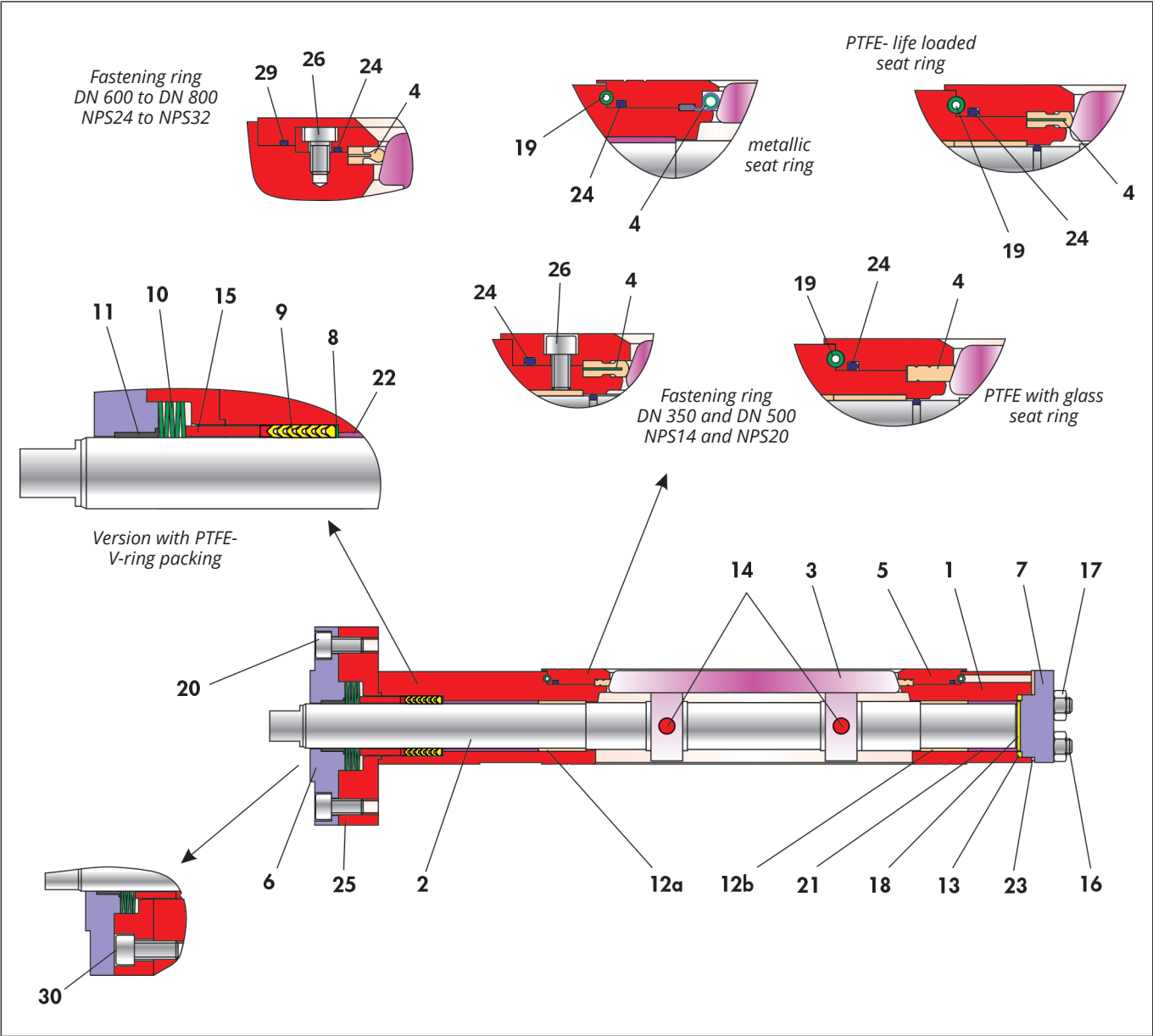


Fig. 3-4: Sectional drawing of the BR 14c butterfly valve with spring washer preloaded V-ring packing

Table 3-3: Parts list for the BR 14c butterfly valve with spring washer preloaded V-ring packing

Item	Description	Item	Description	Item	Description
1	Valve body	10	Disc spring set	20	Screw
2	Control shaft	11	Bearing bush	21	Distance bush
3	Valve disc	12	Bearing bush	22	Distance bush
4	Metal seat ring	13	Sealing	23	Bonnet sealing
	Seat ring	14	Grooved pin	24	O-ring
5	Fastening ring	15	Thrust ring	25	Intermediate flange
6	Stuffing box flange	16	Stud bolt	26	Screw
7	Cover	17	Nut	29	O-ring
8	Disc	18	Disc	30	Screw
9	V-ring packing	19	Tension spring		

- ⇒ Pin the valve disc and control shaft with close-tolerance grooved pins (14).

### 3.5.3.2 Assembling butterfly valves up to DN 300 (NPS12)

- ⇒ Insert the PTFE seat ring (4) or the metal seat ring including the corresponding graphite rings (4) into the body.

#### **i Info**

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

- ⇒ Insert the o-ring (24) into the fastening ring (5).
- ⇒ Place the preassembled fastening ring (5) on the seat ring and press it in with a press.
- ⇒ Loosen the cover (7).
- ⇒ Push the tension spring (19) into the slot.
- ⇒ Fasten the cover as previously described.

### 3.5.3.3 Assembling butterfly valves from DN 350 (NPS14)

- ⇒ Insert the PTFE seat ring (4) or the metal seat ring including the corresponding graphite rings (4) into the body.

#### **i Info**

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

- ⇒ Place the fastening ring (5) on the seat ring (4) and adjust with the screws (26).
- ⇒ Tighten the screws (26) evenly in a criss-cross pattern.

#### **i Info**

*The permissible torque for tightening the fastening ring can be found in Table 15-1 and 15-5 in Chapter "15.1.1 Tightening torques".*

## 3.5.4 Note for installation of actuator elements

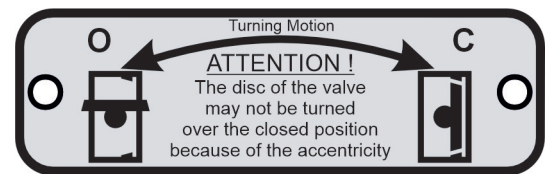
### **! NOTE**

**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.*



**Fig. 3-5:** Turning direction notice sign

## 3.6 Assembling the butterfly valves for oxygen

- The surfaces in contact with oxygen of butterfly valves used for gaseous oxygen with operating pressures above 1 bar must be free of flammable substances.
- The butterfly valves for oxygen must be labelled: **'Oxygen! Keep free of oil and grease.'**

### **! NOTE**

- *Only use suitable oxygen lubricants approved by the German Federal Institute for Materials Testing (BAM).*
- *Refer to Chapter 15.1.2 for details of suitable lubricants.*

- ⇒ The supervisor responsible must monitor work-related procedures (cleaning).
- ⇒ Only use compressed air with zero oil and grease content (nitrogen) for adjustment and leak testing work.
- ⇒ Oxygen appliances may only be installed by qualified persons at workstations prepared for this purpose.
- ⇒ Wear clean, lint-free gloves when installing these appliances.
- ⇒ Clean individual components.
  - Pre-clean with isopropanol
  - Rinse with VE water

## Design and principle of operation

- ⇒ Visually inspect parts for cleanliness.
- ⇒ When storing the appliance or its components, store them in suitable packaging.

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 Packaging and dispatch

This chapter describes the packaging, labelling and transport of goods intended for transport by truck, air freight, sea freight and courier services.

i Info

This description covers the standard packaging for shipping within Germany and abroad.

- ⇒ The packaging procedures described in this chapter apply solely to transport to the destination during a given transport period.
- ⇒ Clarify any deviating packaging instructions with the dispatch department before accepting the order.

4.1.1 General packaging instructions

Packaging describes an effective form of protection of goods for despatch.

The packaging is designed to withstand the handling and transport of goods over various transport routes (sea, air, land) and any environmental and weather conditions that may occur during this time during a period of up to six months.

- Packaging and protective materials do not contain any asbestos
- No hay, straw or other plant-based materials are used as packaging. Nails are used for the construction of crates
- The cargo is protected against damage from normal impact (knocks, bumps) and corrosion (normal rain or marine environment).
- Stacking of freight is not permitted for any transport route.

4.1.2 Standard packaging

The goods are packed in cardboard boxes that are filled with plastic flakes.

⇒ Pack goods up to and including 30 kg exclusively in a cardboard box without a pallet and fill it with plastic flakes.

⇒ Seal each cardboard box with adhesive tape.

Depending on size and volume, straps can also be used on cardboard boxes weighing less than 30 kg.

⇒ Pack goods weighing 30 kg or more in a cardboard box and fill with plastic flakes.

⇒ Seal the box with adhesive tape, pack it on a pallet and strap it down.

4.1.3 Materials

Table 4-4: Dimensions

Description	Dimensions	Material
Standard pallet	80 x 60 cm	
	120 x 80 cm	
Standard cardboard box	18 x 18 x 18 cm	Corrugated cardboard box
	50 x 10 x 35 cm	Corrugated cardboard box
	32 x 32 x 23 cm	Corrugated cardboard box
	40 x 40 x 30 cm	Corrugated cardboard box
	45 x 37 x 37 cm	Corrugated cardboard box
	80 x 60 x 80 cm	Corrugated cardboard box
	120 x 80 x 120 cm	Flat-pack corrugated cardboard container
Filling material	Plastic flakes FLO-PAK in acc. with directive 94/62/EC.	

4.1.4 Packaging for dispatch by truck or air freight

Package goods for transport by truck or air freight as described under ‘Standard packaging’, see section 4.1.2.

4.1.5 Packaging for dispatch by sea freight

⇒ To protect the goods, only use wooden crates for dispatch by sea freight. Do not use standard packaging.

⇒ Package goods in wooden crates in accordance with ISPM 15. Seal the crates with nails.

⇒ Filling material: Aluminium bags with Trocellen products.

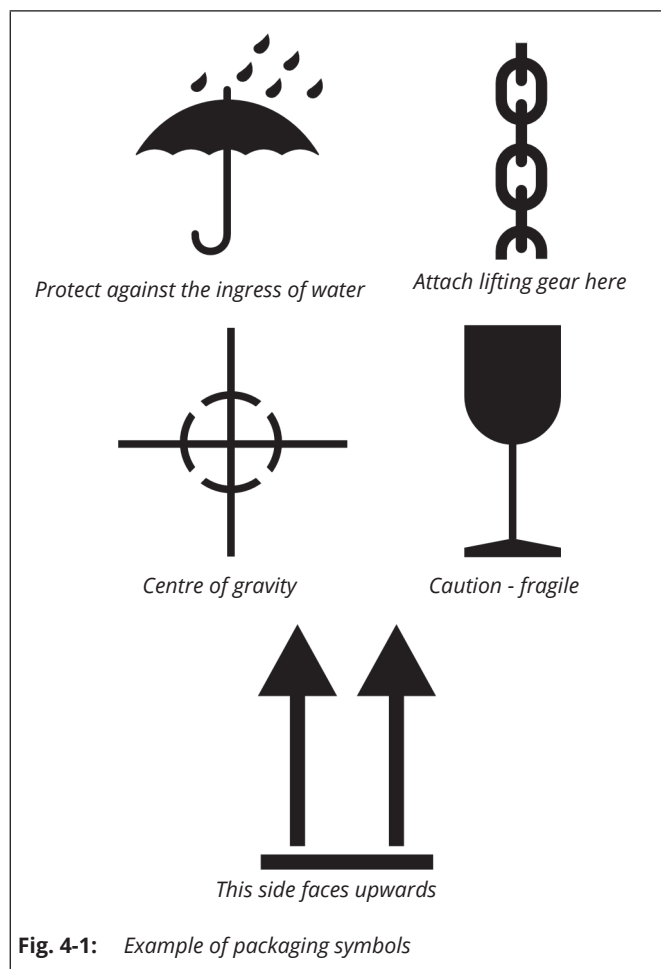
### 4.1.6 Additional service for packaging and dispatch

Over and above the standard packaging mentioned above, additional services are available at an extra charge.

- Foil filling material
- Filling material – filling foam flakes (made by Trocellen)
- Goods individually packaged in PE bags
- Maritime transport packaging
- Wooden crates
- Long-term preservation
- Photos
- Special markings and additional markings on the packages in accordance with customer specifications
- Special markings of individual items of goods using labels or adhesive stickers in accordance with customer stipulations
- Acceptance tests of packaging

### 4.1.7 Marking

#### 4.1.7.1 Packaging symbols



⇒ Mark all attachment points with a chain symbol.

⇒ Indicate suitable handling methods using the symbols on the packaging.

The symbols used comply with DIN 55402.

#### 4.1.7.2 Delivery note

Marking and a delivery note constitute part of the package.

The delivery note includes the following details:

- Customer name
- Order number
- Consignment number
- Destination
- Country of destination
- Numbers of the corresponding packages (for example 1 of 3 - indicated directly on the package)

### 4.2 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).

⇒ Also check the packaging for damage.

If damage is detected, immediately notify PFEIFFER and the transport company.

If no report is made, PFEIFFER shall not retrospectively recognise any complaint about damage sustained by the goods while in transit.

⇒ If the goods are not unpacked immediately after arrival at their destination, store the cardboard boxes and crates in a dry, closed and heated storage area.



**Tip**

*Subject to compliance with the above conditions, undamaged packaging provides protection for a total of six months (transport and storage).*

### 4.3 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.

## 4.4 Transporting and lifting the butterfly valve

### DANGER

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

*Do not stand under suspended loads.*

#### **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.

### 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.

### 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.

### 4.4.1 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.

### 4.4.2 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. 4-2.
- ⇒ Secure the sling against shifting and slipping off.
- ⇒ Fasten the sling such that it can be removed again after installation in the pipe.
- ⇒ Avoid swinging and tipping the 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

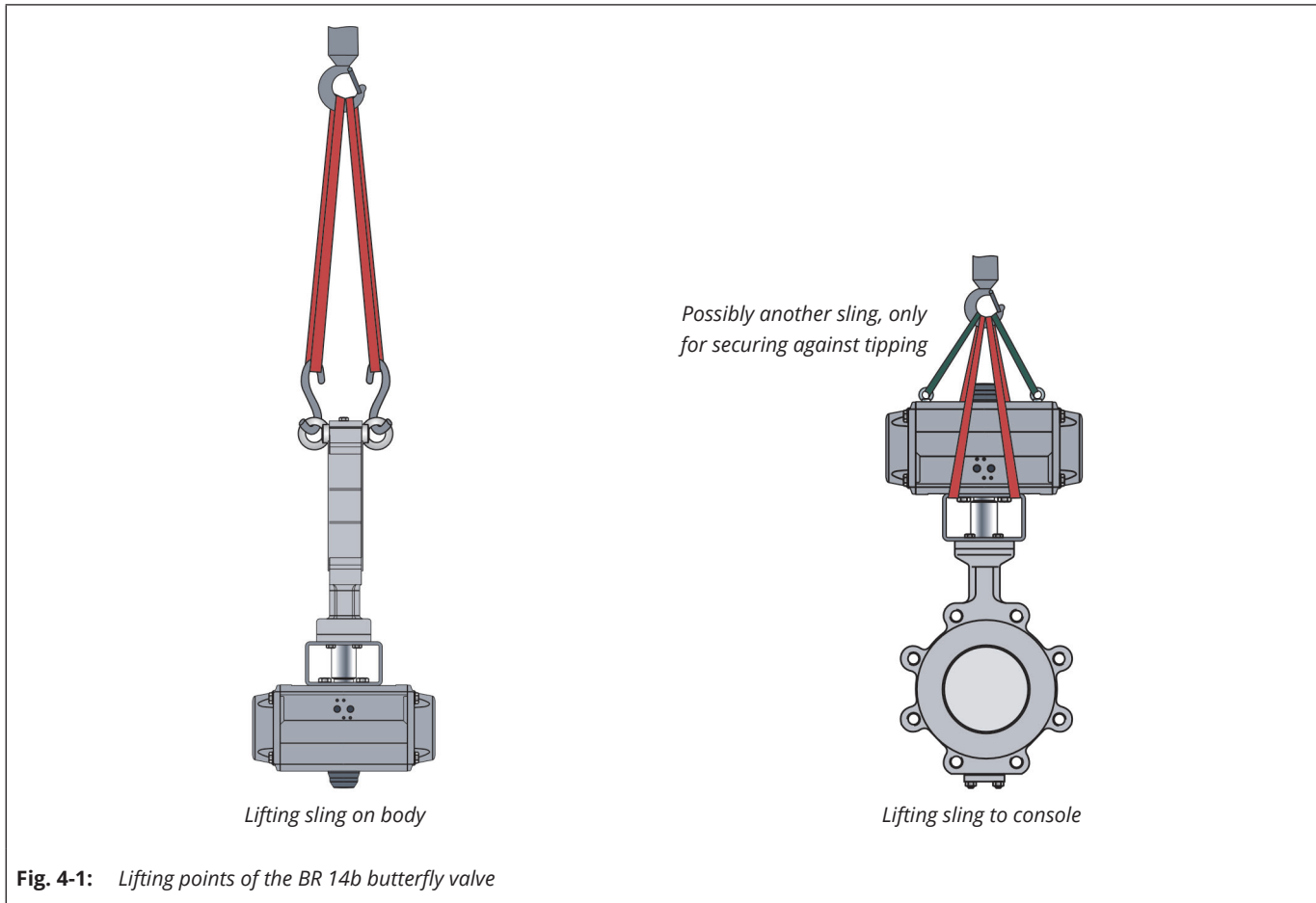
#### **Danger due to incorrect lifting and transport!**

*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.





#### 4.4.3 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. 4-2. 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 eyes on the actuator and suspension element but only to prevent the load from toppling.
- ⇒ 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.

#### 4.4.4 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. 4-2. 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 eyes on the actuator and suspension element but only to prevent the load from toppling.
- ⇒ 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.



## 4.5 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.

### **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 °C ±15 °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.

### **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 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 14b 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.*

## ⚠ WARNING

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

Actuators are not "stepladders".

- ⇒ Loads may not be applied to the actuators as they can damage or destroy the butterfly valve.

### **Danger and damage due to heavy actuator units!**

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

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

## ! NOTE

### **Damage 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.

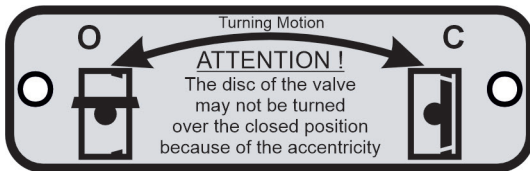


Fig. 5-1: Turning direction notice sign

## i Info

### **Take a note of the alignment of the actuator.**

The orientation of the actuator and valve is defined in a 4-digit code, see manual ► SAMLoop actuator alignment.

## 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.
- ⇒ A functional test is to be carried out at the beginning of installation for manually-operated butterfly valves: the butterfly valve must close and open correctly. Detected malfunctions must be fixed before commissioning. See also chapter "8 Malfunction".
- ⇒ 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 seal 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!**

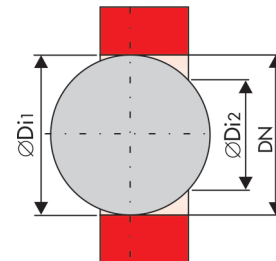
- ⇒ Tighten the flange connections evenly and in a criss-cross pattern with the torques indicated in Table 15-7 in Chapter "15.1.1 Tightening torques".

- ⇒ After a long storage period, retighten the body screws. Also retighten the screws of the stuffing box according to Table 15-1 and 15-2 to 15-5 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.

**Table 5-1:** Minimum required inner diameter  $D_i$  of the counterflange

DN		80	100	150	200	250	300	350	400	500	
NPS		3	4	6	8	10	12	14	16	20	
BR14b BR14c BR74b	ØDi1		54	78	128	180	227	276	308	365	406
	ØDi2	Row 20	22	50	82	122	151	217	252	308	446
		Row 25	35	60	96	153	210	256	283	308	446
		Row 16	-	-	118	166	217	260	301	348	454

Fig. 5-2: Inside diameter



**Fig. 5-2:** Inside diameter

**! 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.

- ⇒ 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.

## 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.

---

**i 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 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 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.
- 

- ⇒ 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 switching 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.*

### **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.

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

- The 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".
- 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".





## 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.

- 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.
- In the case of butterfly valves with a ratchet lever, the position of the ratchet lever indicates the position of the butterfly valve:
  - Ratchet lever 90° transverse to the pipe: butterfly valve closed,
  - Ratchet lever parallel to the pipe: butterfly valve open.

### DANGER

#### **Danger of injury due to jerky operation of the butterfly valve!**

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

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

- If a butterfly valve leaks, observe chapter “8 Malfunction”.

### **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 15-7 in Chapter “15.1.1 Tightening torques”.
- It can also be necessary to retighten the screw connections on the body parts with the corresponding tightening torques according to Table 15-1 and 15-2 to 15-5 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.



## 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><i>An excessive tightening torque when retightening the flange screws can damage the butterfly valve and pipe!</i></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 15-7 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 cover	Connection of the cover to the valve body released	Retighten the cover screws. Tighten the cover connection with the respective tightening torque, see Table 15-1 and 15-4 in chapter "15.1.1 Tightening torques".
	Cover still untight after retightening	Replace the cover sealing and/or butterfly valve, see chapter "1 Safety instructions and safety measures".
Leaks in the switching shaft sealing	Medium escapes	<p><b>! DANGER</b></p> <p><b><i>Danger of injury due to escaping medium!</i></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> <hr/>
	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". For the required repair instructions, see Chapter "12 Repairs".</p>
	Medium escapes from the adjustable stuffing box	<p>Retighten both screws on the compression spacer alternately and in small amounts with a 1/4 turn each in the clockwise direction until the leakage stops.</p> <p>If the leakage is not stopped in this way, a repair is necessary.</p> <hr/> <p><b>💡 Tip</b></p> <p><i>When the nuts on the stuffing box must be loosened or screwed off (counterclockwise):</i></p> <hr/> <p>Request spare parts from PFEIFFER, see Chapter "15.2 Spare parts". For the required repair instructions, see Chapter "12 Repairs".</p>

Type of fault	Possible cause	Measures
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". For the required repair instructions, see Chapter "12 Repairs".</p>
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	<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". For the required repair instructions, see Chapter "12 Repairs".</p>
Problems in the actuator unit	The pneumatic actuator must be removed	<p>Disconnect the connection to the control pressure.</p> <p>Remove the actuator from the butterfly valve, observe the "Safety instructions and safety measures", see the included actuator unit manuals.</p>

### **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.

### **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".

## **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.

## 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 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 Table 15.1 or Table 15-2 in 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".

### 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".

Test	Measures in the case of a negative test result
Check the control shaft sealing for tightness from the outside.	The control shaft sealing with a PTFE V-ring packing is preloaded with a disc spring set and is therefore maintenance free.
Check the rotary movement of the actuator- and control shaft for smooth movement.	<p>Tighten the packing correctly.</p> <p>If the actuator- and control shaft are blocked, remove the blockage.</p> <p><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.</p> <p>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.</p>
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 ball valve and actuator for leaks.	Regular maintenance work on the ball 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 (4) 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.

## 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.

- ⇒ 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.

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.





## 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  
► <https://pfeiffer.samsongroup.com>.

## 11.2 Disassembling the actuator

See the corresponding actuator documentation.



## 12 Repairs

If the operation of the 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 packing

If a leak is found in the stuffing box (6), the PTFE rings of the V-ring packing (9) or the rings of the meshwork packing (9) 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".

#### 12.1.1 Replacing the V-ring packing with butterfly valve BR 14b (Type WTD and MTD)

- ⇒ Place the butterfly valve on an even and clean work surface so that the packing space is easy to reach.
- ⇒ Loosen the screws (20) and remove the stuffing box flange (6) carefully.
- ⇒ Remove the disc springs from the disc spring set (10).
- ⇒ Remove the thrust ring (15).

##### **Version with V-ring packing**

- ⇒ Remove the V-ring packing (9).
- ⇒ 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.

##### **Version with M-PTFE wedge ring packing**

- ⇒ Remove the wedge ring packing (9).

- ⇒ Ask PFEIFFER about dismantling the wedge ring packing.

##### **Assembly for all designs**

- ⇒ Assemble the butterfly valve as described in Chapter "3.5.1 Assembly of butterfly valve BR 14b (Type WTD and MTD)".

#### 12.1.2 Replacing the meshwork packing with butterfly valve BR 14b (Type WNS)

- ⇒ Place the butterfly valve on an even and clean work surface so that the packing space is easy to reach.
- ⇒ Loosen the screws (20) and remove the stuffing box (6) carefully.
- ⇒ Remove the meshwork packing (9).
- ⇒ Check the rings of the meshwork 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 "3.5.2 Assembly of butterfly valve BR 14b (Type WNS)".

#### 12.1.3 Replacing the V-ring packing with butterfly valve BR 14c (BR 74b) (Type WTD and MTD)

- ⇒ Place the butterfly valve on an even and clean work surface so that the packing space is easy to reach.
- ⇒ Loosen the screws (20) and remove the stuffing box flange (6) carefully.
- ⇒ Remove the disc springs from the disc spring set (10).
- ⇒ Remove the thrust ring (15).

##### **Version with V-ring packing**

- ⇒ Remove the V-ring packing (9).
- ⇒ 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.

##### **Version with M-PTFE wedge ring packing**

- ⇒ Remove the wedge ring packing (9).
- ⇒ Ask PFEIFFER about dismantling the wedge ring packing.

##### **Assembly for all designs**

- ⇒ Assemble the butterfly valve as described in Chapter "3.5.3 Assembly of butterfly valves BR 14c (BR 74b) (Type WTD and MTD)".

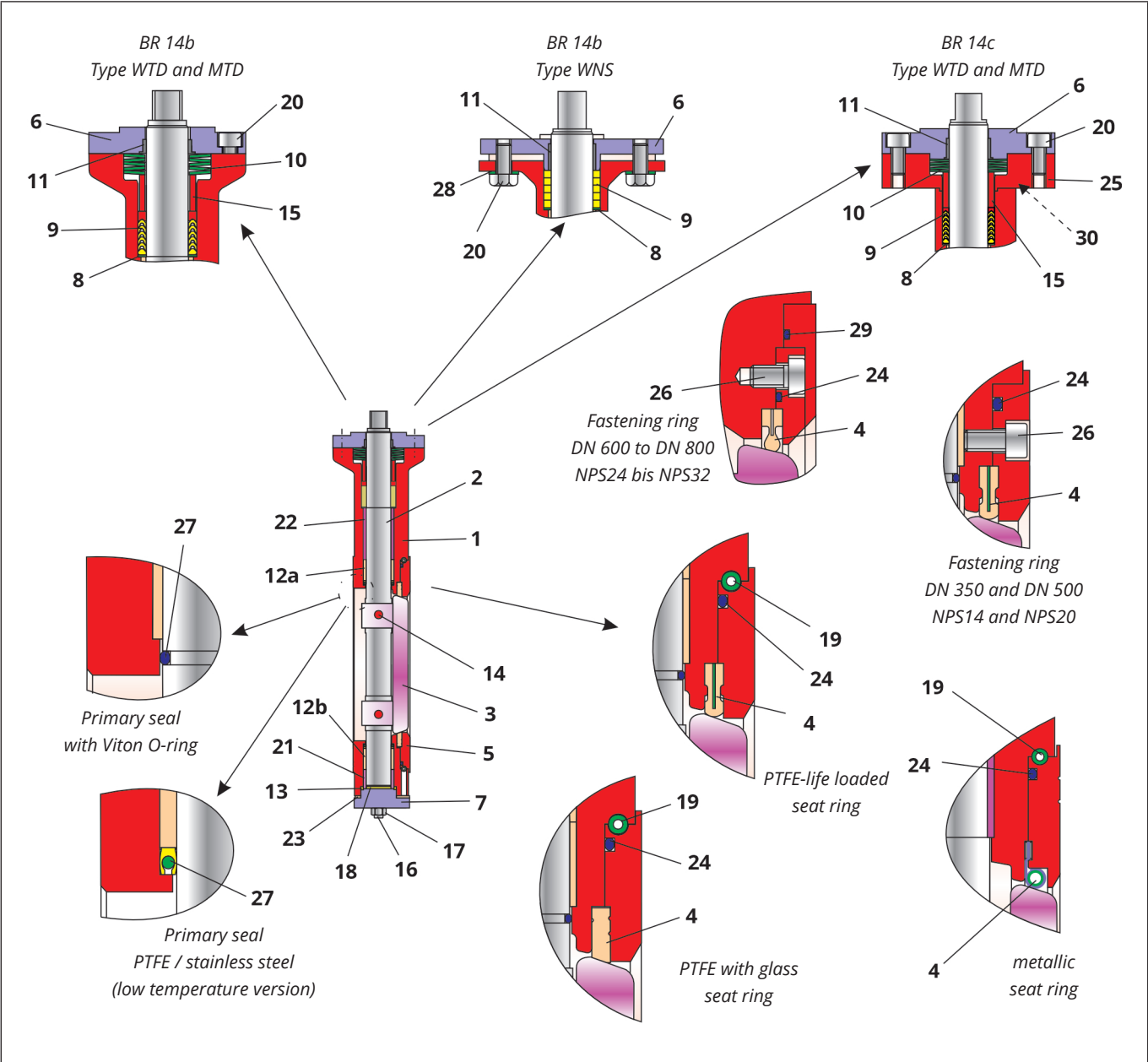


Fig. 12-1: Sectional drawing of a butterfly valve BR 14b

Table 12-1: Parts list of the BR 14b butterfly valve

Item	Description	Item	Description	Item	Description
1	Valve body	11	Bearing bush	21	Distance bush
2	Control shaft	12	Bearing bush	22	Distance bush
3	Valve disc	13	Sealing	23	Cover sealing
4	Seat ring	14	Grooved pin	24	O-ring
5	Fastening ring	15	Thrust ring	25	Intermediate flange
6	Stuffing box	16	Stud bolt	26	Screw
7	Cover	17	Nut	27	Primary sealing
8	Disc	18	Disc	28	Washer
9	Packing	19	Tension spring	29	O-ring
10	Disc spring set	20	Screw	30	Screw

## 12.2 Replacing the seat ring

If a leak is found in the passage of the butterfly valve, the seat ring (4) 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".

### 12.2.1 Replacing the seal ring in butterfly valves up to DN 300 (NPS12)

- ⇒ Place the butterfly valve on an even and clean work surface so that the seal ring is easy to reach.
- ⇒ Loosen the nuts (17) and remove the cover (7).
- ⇒ Remove the tension spring (19).
- ⇒ 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.

#### Info

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

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

### 12.2.2 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.

#### 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 Additional repairs

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

## 12.4 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  
► <https://pfeiffer.samsongroup.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 m³/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  
► <https://pfeiffer.samsongroup.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 14b, see page 14-4.
- Declaration of installation for partly completed machinery according to Machinery Directive 2006/42/EC for butterfly valve BR 14b, 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 14b, Type 14b eco+ and Type 14c Butterfly valves (BR 14b), (BR 14b eco+) (BR 14c)</b> <b>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>
<ol style="list-style-type: none"> <li>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.</li> <li>2. They may only be operated observing the Installation and operating instructions ► EB 14b delivered together with the valve.</li> </ol> <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.</p> <p>(See ► EB 14b, 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 14b and ► TB 14b eco+ 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 14b, 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

SMART IN FLOW CONTROL

HE 2014-68-EU\_BR14b-01\_EN

## 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 14b, Type 14b eco+ and Type 14c Butterfly valves (BR 14b), (BR 14b eco+) (BR 14c)</b> <b>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>
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. 2. They may only be operated observing the Installation and operating instructions ► <b>EB 14b</b> delivered together with the valve. <i>(See ► <b>EB 14b</b>, Chapter 1 for butterfly valves intended for dead-end service)</i>	

*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 ► <b>TB 14b</b> and ► <b>TB 14b eco+</b> <i>NOTE: This Manufacturer's Declaration applies to all valve types listed in this catalogue.</i>
--

*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 14b**, 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	PFEIFFER Chemie-Armaturenbau GmbH, 47906 Kempen, Germany
declares for the listed products that:	<b>Type 14b Control and Shut-off Butterfly Valve (BR14b)</b> <ul style="list-style-type: none"><li>• with a Type 30a Multi-turn Actuator (BR30a)</li><li>• with a Type 31a Quarter-turn Actuator (BR31a)</li><li>• with a rotary actuator of a different make</li></ul> Prerequisite: the unit was sized and assembled by PFEIFFER Chemie-Armaturenbau GmbH. The serial number on the valve refers to the entire unit.
<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:</p> <p>PFEIFFER data sheet for Type 14b Valve ▶ TB 14b</p> <p>PFEIFFER data sheet for Type 30a Actuator ▶ TB 30a</p> <p>PFEIFFER data sheet for Type 31a Actuator ▶ TB 31a</p> <p>PFEIFFER mounting and operating instructions for Type 14b Valve ▶ EB 14b</p> <p>PFEIFFER mounting and operating instructions for Type 30a Actuator ▶ EB 30a</p> <p>PFEIFFER mounting and operating instructions for Type 31a Actuator ▶ EB 31a</p> <p>PFEIFFER safety manual for Type 14b Valve ▶ SH 14</p> <p>PFEIFFER safety manual for Type 30a Actuator ▶ SH 30a</p> <p>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>
---

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 14b, section 1) and considerably change the valve or an assembly delivered with it.

Persons authorized to compile the technical file:

Kempen, 28 May 2021

  
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 14b Control and Shut-off Butterfly Valve (Type 14b) <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 14b Butterfly Valve ► TB 14b

PFEIFFER Mounting and Operating Instructions for Type 14b Butterfly Valve ► EB 14b

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 14b, section 1) and considerably change the valve or an assembly delivered with it.

Persons authorized to compile the technical file:

Kempen, 22 November 2021

  
 Stefan Czayka  
 Head of Quality Management/IMS Representative





## 15 Annex

### 15.1 Tightening torques, lubricant and tools

#### 15.1.1 Tightening torques

##### **i** Info

The tightening torques named in the tables should only be considered as very approximate and non-binding guide values. The coefficient of friction  $[\mu]$  depends on the kind of lubricant used. The coefficient of friction of the lubricants recommended by PFEIFFER is listed in the table. Lubricating the threads with other lubricants can lead to undefined tightening conditions.

**Table 15-1:** Tightening torques MA in Nm

Coefficient of friction	A2-70 / A4-70 R <sub>p</sub> 0.2 min. 450 N/mm <sup>2</sup>								A2-50 / A4-50 R <sub>p</sub> 0.2 min. 210 N/mm <sup>2</sup>		
	M4	M5	M6	M8	M10	M12	M16	M20	M24	M27	M30
<b>0.10</b>	1.7	3.4	5.9	14.5	30	50	121	244	234	328	445
<b>0.12</b>	2.0	3.8	6.7	16.3	33	56	136	274	264	371	503
<b>0.14</b>	2.2	4.2	7.4	17.8	36	62	150	303	290	410	556
<b>0.16</b>	2.3	4.6	7.9	19.3	39	66	162	328	314	444	602
<b>0.18</b>	2.5	4.9	8.4	20.4	41	70	173	351	336	475	643
<b>0.20</b>	2.6	5.1	8.8	21.5	44	74	183	370	355	502	680
<b>0.30</b>	3.0	6.1	10.4	25.5	51	88	218	439	421	599	809
<b>0.40</b>	3.3	6.6	11.3	27.6	56	96	237	479	458	652	881

##### 15.1.1.1 Stuffing box flange (Type MTD and WTD)

For the connection of the body sections, the screw connections are tightened in a criss-cross pattern with the tightening torques indicated below. Refer to Table 15-1 for the tightening torques.

**Table 15-2:** Screw connections of the stuffing box flange

Nominal size		Qty.	Thread (20)
DN	NPS		
50	2	4	M5
80	3	4	M6
100	4	4	M6
150	6	4	M8
200	8	4	M10
250	10	4	M10
300	12	4	M12

Nominal size		Qty,	Thread (20)
DN	NPS		
350	14	on request	
400	16	4	M16
500	20	4	M16
600	24	on request	
700	28		
800	32		

##### 15.1.1.2 Adjustable stuffing box (Type WNS)

The required torques for tightening the adjustable stuffing box can be found in Table 15-3. Torque wrenches must be used to ensure that the torque is reached.

**Table 15-3:** Screw connections and tightening values for the adjustable stuffing box

Nominal size		Qty	Thread (20)	Tightening torque MA [Nm]
DN	NPS			
80	3	2	M6	4
100	4	2	M6	5
150	6	2	M8	6

Nominal size		Qty	Thread (20)	Tightening torque MA [Nm]
DN	NPS			
250	10	2	M10	7
300	12	2	M10	9
400	16	2	M10	on request

### 15.1.1.3 Cover

When assembly the cover, the screw connections are tightened alternately and evenly. Refer to Table 15-1 for the tightening torques.

**Table 15-4:** *Screw connections of the cover*

Nominal size		Qty.	Thread (16)
DN	NPS		
50	2	2	M6
80	3	2	M6
100	4	2	M8
150	6	2	M8
200	8	4	M8
250	10	3	M8
300	12	2	M10

Nominal size		Qty.	Thread (16)
DN	NPS		
350	14	2	M16
400	16	2	M16
500	20	2	M20
600	24	on request	
700	28		
800	32		

### 15.1.1.4 Fastening ring

When assembly the fastening ring, the screw connections are tightened alternately and evenly. Refer to Table 15-1 for the tightening torques.

**Table 15-5:** *Screw connections of the fastening ring*

Nominal size		Qty.	Thread (26)
DN	NPS		
350	16	12	M8
400	16	12	M10
500	20	16	M10

Nominal size		Qty.	Thread (26)
DN	NPS		
600	24	on request	
700	28		
800	32		

### 15.1.1.5 Intermediate flange (BR 14c)

When assembly the intermediate flange, the screw connections are tightened alternately and evenly. Refer to Table 15-1 for the tightening torques.

**Table 15-6:** *Screw connections of the intermediate flange*

Nominal size		Qty.	Thread (30)
DN	NPS		
50	2	4	M5
80	3	4	M6
100	4	4	M6
150	6	4	M10
200	8	4	M10
250	10	4	M12
300	12	4	M12

Nominal size		Qty.	Thread (30)
DN	NPS		
350	14	4	M12
400	16	4	M20
500	20	4	M20
600	24	on request	
700	28		
800	32		

### 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 15-7:** Required tightening torques

Thread	Tightening torques [Nm] <sup>1)</sup>		Tightening method
	Sealing units A	Sealing units B	
<b>M16</b>	125 <sup>2)</sup>	80	With manually-operated spanner with a suitable extension if necessary
<b>M20</b>	240 <sup>3)</sup>	150	
<b>M24</b>	340	200	With a torque wrench or other torque-controlled procedure
<b>M27</b>	500	250	
<b>M30</b>	700	300	
<b>M33</b>	900	500	
<b>M36</b>	1200	750	
<b>M39</b>	1400	900	
<b>M45</b>	2000	1200	

<sup>1)</sup> These tightening torques were calculated by the company BASF SE and confirmed by partner companies.  
<sup>2)</sup> Recommended lever length 300 mm.  
<sup>3)</sup> Recommended lever length 550 mm.

**Table 15-8:** Screw connections of the flanges

Nominal size DN	Nominal pressure			
	PN 10	PN 16	PN 25	PN 40
<b>50</b>	-	4x M16	-	4x M16
<b>80</b>	-	8x M16	-	8x M16
<b>100</b>	-	8x M16	-	8x M20
<b>150</b>	-	8x M20	-	8x M24
<b>200</b>	8x M20	12x M20	12x M24	12x M27
<b>250</b>	12x M20	12x M24	12x M27	12x M30
<b>300</b>	12x M20	12x M24	16x M27	16x M30

Nominal size DN	Nominal pressure			
	PN 10	PN 16	PN 25	PN 40
<b>350</b>	16x M20	16x M24	16x M30	16x M33
<b>400</b>	16x M24	16x M27	16x M33	16x M36
<b>500</b>	20x M24	20x M30	20x M33	20x M39
<b>600</b>	20x M27	20x M33	20x M36	-
<b>700</b>	on request			-
<b>800</b>	24x M30	24x M36	24x M45	-

**Table 15-9:** 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 15-10:** 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 Lubricants

Various lubricants for standard and special applications can be requested from PFEIFFER.

It is important to consider the specific requirements of the application.

This is because the choice of lubricant depends on factors such as temperature, pressure and material pairing.

Ask PFEIFFER for further information on suitable lubricants for special requirements.

Here are a few **examples** of typical applications:

- **Standard applications**

These lubricants should cover a temperature range of -20 °C to 200 °C and, depending on their composition, they can have a coefficient of sliding friction of around 0.1 to 0.2.

They are suitable for many general applications.

- **Low-temperature applications**

These lubricants are suitable for temperatures down to -50 °C or lower and often have a coefficient of sliding friction of 0.05 to 0.1.

Lubricants for extremely low temperatures can provide very low levels of friction.

- **High-temperature applications**

These can withstand temperatures of up to 200 °C or more. They can also have coefficients of friction similar to standard lubricants, but with better stability.

Lubricants for temperatures of up to 300 °C and above can offer a coefficient of sliding friction of around 0.1 to 0.15.

- **Oxygen applications**

These lubricants are specially designed for safe use in environments with a high oxygen content. They can often have a coefficient of sliding friction of 0.1 to 0.2.

- **Other applications**

- Requirements specified by the customer.

### 15.1.3 Tools

#### Recommended tools

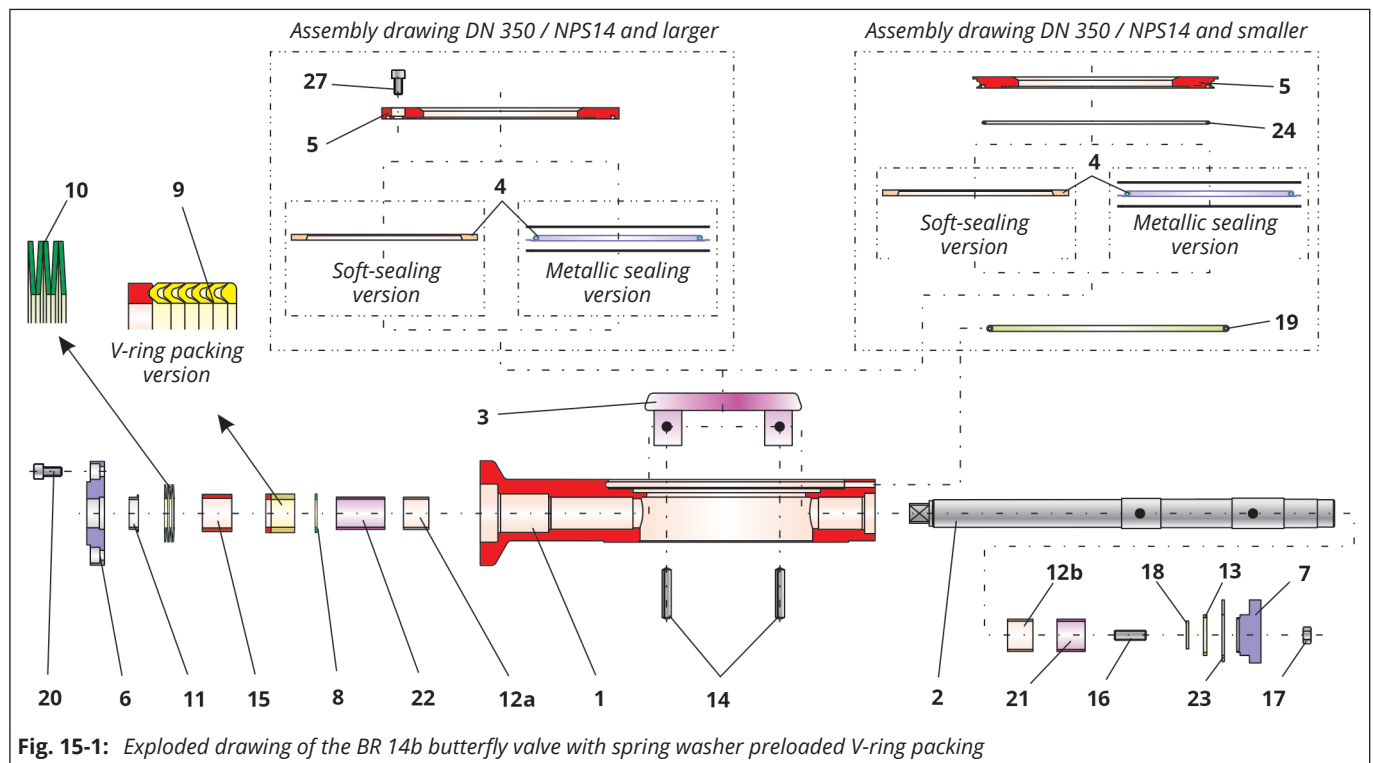
Suitable tools are required to work on the butterfly valve. Unsuitable tools can damage the butterfly valve.

### 15.2 Spare parts

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

- Chapter “15.2.1 Spare parts for butterfly valve **BR 14b** (type **WTD** and **MTD**)”
- Chapter “15.3.2 Spare parts for butterfly valve **BR 14b** (type **WNS**)”
- Chapter “15.3.3 Spare parts for butterfly valve **BR 14c** (type **WTD** and **MTD**)”.

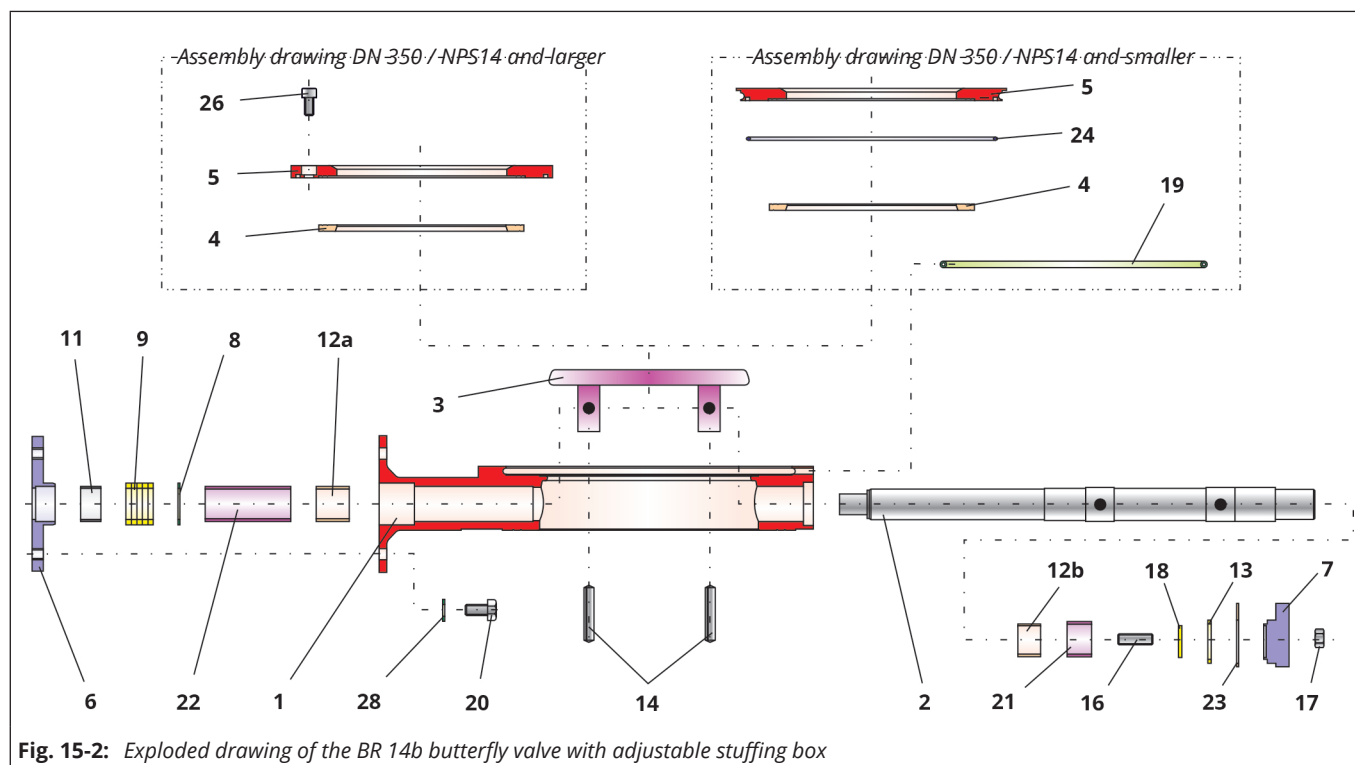
### 15.2.1 Spare parts for butterfly valve BR 14b (Type WTD and MTD)



**Table 15-11:** Recommended spare parts for the butterfly valve BR 14b (Type WTD and MTD)

Item	Description	Material		Spare part kit	
		DIN	ANSI	Commissioning	2 year operation
1	Valve body	1.4408 • 1.0619	A351 CF8M • A216 WCB		
2	Control shaft	1.4462 • 1.4542 • H1150	A182 F51 • AISI 630 • H1150D		•
3	Valve disc	1.4408	A351 CF8M		•
4	Seat ring	PTFE Disc spring preloaded		•	•
	Metal seat ring	Nickel			
5	Fastening ring	1.4571	A479 F316Ti		
6	Stuffing box flange	1.4571	A479 F316Ti		
7	Cover	1.4571			
8	Disc	1.4571			
9	V-ring packing	1.4305 / PTFE		•	•
10	Disc spring set	1.8159 / Delta Tone		•	•
11	Bearing bush	PTFE with carbon		•	•
12	Bearing bush	PTFE with glass or metal		•	•
13	Sealing	PTFE		•	•
14	Grooved pin	1.4542			•
15	Thrust ring	1.4571			
16	Stud bolt	A4-70			•
17	Nut	A4-70			•
18	Disc	PTFE		•	•
19	Tension spring	1.4310		•	•
20	Screw	A4-70			•
21	Distance bush	1.4571			
22	Distance bush	1.4571			
23	Bonnet sealing	PTFE with glass		•	•
24	O-ring	Viton		•	•
26	Screw	A4-70			•

## 15.2.2 Spare parts for butterfly valve BR 14b (Type WNS)

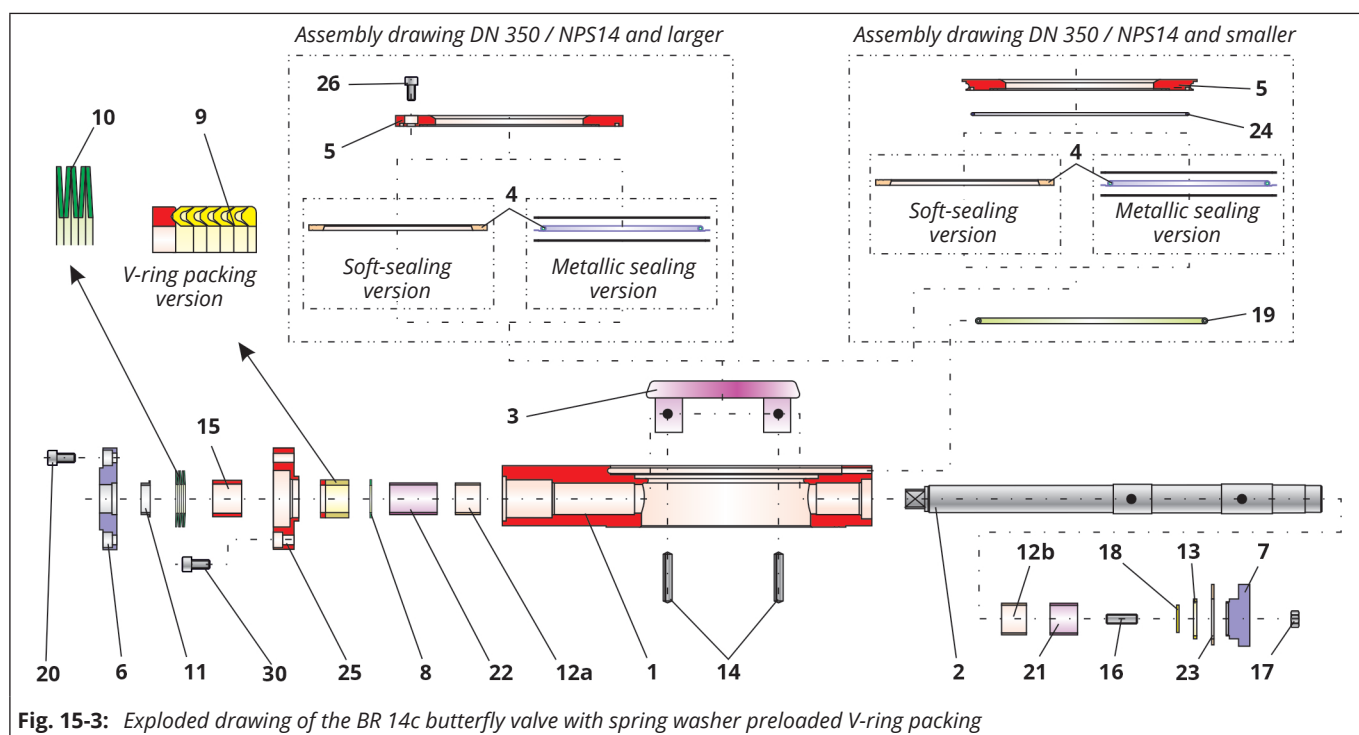


**Table 15-12:** Recommended spare parts for the butterfly valve BR 14b (Type WNS)

Item	Description	Material		Spare part kit	
		DIN	ANSI	commissioning	2 year operation
1	Valve body	1.4408 • 1.0619	A351 CF8M • A216 WCB		
2	Control shaft	1.4462 • 1.4542 • H1150	A182 F51 • AISI 630 • H1150D		•
3	Valve disc	1.4408	A351 CF8M		•
4	Seat ring	PTFE spring washer preloaded		•	•
5	Fastening ring	1.4571	A479 F316Ti		
6	Adjustable stuffing box	1.4571	A479 F316Ti		
7	Cover	1.4571			
8	Disc	1.4571			
9	Packing	PTFE		•	•
11	Bearing bush	PTFE with carbon		•	•
12	Bearing bush	PTFE with glass or metal		•	•
13	Sealing	PTFE		•	•
14	Grooved pin	1.4542			•
16	Stud bolt	A4-70			•
17	Nut	A4-70			•
18	Disc	PTFE		•	•
19	Tension spring	1.4310		•	•
20	Screw	A4-70			•
21	Distance bush	1.4571			
22	Distance bush	1.4571			
23	Bonnet sealing	PTFE with glass		•	•
24	O-ring	Viton		•	•
26	Screw	A4-70			•
28	Washer	1.4571			



### 15.2.3 Spare parts for butterfly valve BR 14c (Type WTD and MTD)



**Table 15-13:** Recommended spare parts for the butterfly valve BR 14c (Type WTD and MTD)

Item	Description	Material		Spare parts kit	
		DIN	ANSI	commissioning	2 year operation
1	Valve body	1.4571 • 1.0570	A240 Gr. 316L • A516 Gr.70		
2	Control shaft	1.4462 • 1.4542 • H1150	A182 F51 • AISI 630 • H1150D		•
3	Valve disc	1.4408	A351 CF8M		•
4	Metal seat ring	Nickel		•	•
	Seat ring	PTFE disc spring preloaded			
5	Fastening ring	1.4571	A479 F316Ti		
6	Stuffing box	1.4571	A479 F316Ti		
7	Cover	1.4571			
8	Disc	1.4571			
9	V-ring packing	1.4305 / PTFE		•	•
10	Disc spring set	1.8159 / Delta Tone		•	•
11	Bearing bush	PTFE with carbon		•	•
12	Bearing bush	PTFE with glass or metal		•	•
13	Sealing	PTFE		•	•
14	Grooved pin	1.4462			•
15	Thrust ring	1.4571			
16	Stud bolt	A4-70			•
17	Nut	A4-70			•
18	Disc	PTFE		•	•
19	Tension spring	1.4310		•	•
20	Screw	A4-70			•
21	Distance bush	1.4571			
22	Distance bush	1.4571			
23	Cover sealing	PTFE with glass		•	•
24	O-ring	Viton		•	•
25	Intermediate flange	1.4305			
26	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  
► <https://pfeiffer.samsongroup.com>.

### Further information

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

**PFEIFFER Chemie-Armaturenbau GmbH**

Hooghe Weg 41 • 47906 Kempen • Germany

Phone: +49 2152 / 2005-0

E-Mail: [sales-pfeiffer-de@samsongroup.com](mailto:sales-pfeiffer-de@samsongroup.com)

Internet: <https://pfeiffer.samsongroup.com>





AND  
EVERYTHING  
FLOWS

**PFEIFFER Chemie-Armaturenbau GmbH**

Hooghe Weg 41 · 47906 Kempen · Germany

Phone: +49 2152 2005-00

E-Mail: [sales-pfeiffer-de@samsongroup.com](mailto:sales-pfeiffer-de@samsongroup.com) · Internet: <https://pfeiffer.samsongroup.com>