

# Maintenance

## Butterfly Valve Series 14b / 14c / 74b



Fig. 1 - High-Performance Butterfly valve Series 14b

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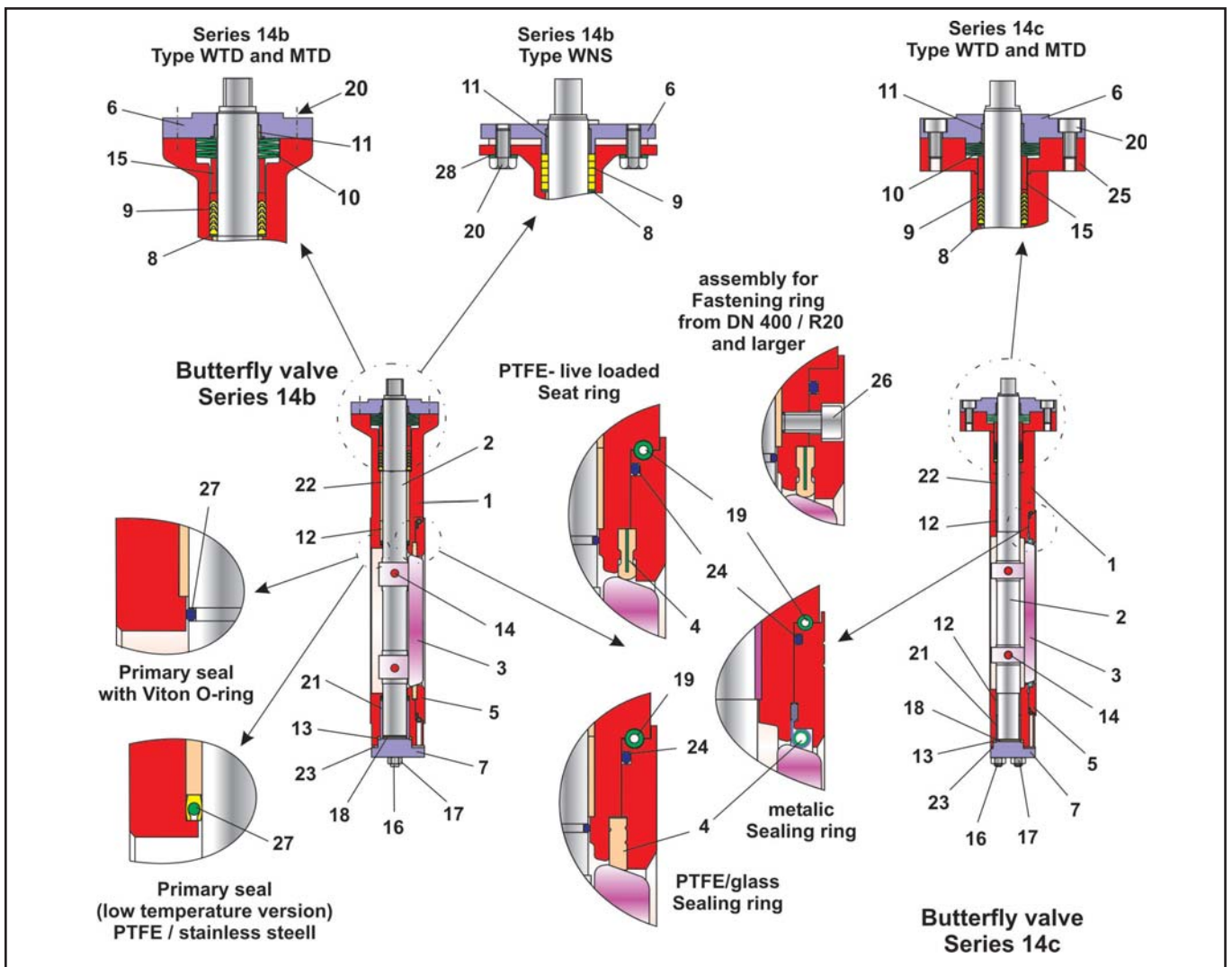


Fig. 2 – Variants of Butterfly Valves Series 14b, 14c and 74b

# High Performance Butterfly Valve Series 14b / 14c / 74b

## 1. Introduction

These instructions are intended to support the user in the assembly and repair of Butterfly valves of the Series **14b**, **14c** and **74b**.

Technical details, as a result of the further development of the valves mentioned in these instructions, are subject to alteration. The text and illustrations do not necessarily display the scope of supply or an eventual order of spare parts. Drawings and graphics are not to scale.

Customer-related special designs, which are not in accordance with our standard offer, are not shown.

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The equipment may only be dismantled and disassembled by skilled staff who are familiar with the assembly, the start-up and the operation of this product.

Skilled staff in the sense of these repair and assembly instructions are persons who, as a result of their training, their knowledge and their experience, as well as their knowledge of the relevant standards, are able to judge the tasks assigned to them and are able to recognize possible dangers.

## 2. Design, operation and dimensions

Design, operation and dimensions as well as all further details and technical data may be found in the **data sheets** < **TB 14b\_EN** > for Series 14b and 14c or < **TB 74b\_EN** > for Series 74b.

## 3. Installation, start-up and maintenance

Guidelines for the installation, start-up and maintenance are to be found in the **operating instructions**

< **BA 14b-01\_EN** > for automatic Butterfly valves, resp.

< **BA 14b-02\_EN** > for hand-operated butterfly valves.

## 4. Assembly of the Butterfly Valve

### 4.1 Preparation for the assembly

In order to assemble the valve, all the parts must be prepared, i.e. the parts are carefully cleaned and placed on a soft surface (rubber mat or similar).

Please, pay attention! Plastic parts are nearly always soft and very sensitive, and particularly the sealing surfaces should not be damaged.



**Caution:** In order to prevent a cold welding of the screws in the bodies, a high-performance grease paste is employed during manufacturing (e.g. Gleitmo 805. from Fuchs).

For valves employed in oxygen environments, this agent may not be used. For grease-free valves, especially when employed in an oxygen environment, a suitable lubricant is to be chosen.



**Note:** The position and arrangement of the individual parts shown in the exploded view diagrams must be adhered to on assembling the valve.

### 4.2 Assembly of the Butterfly Valve Series 14b with live-loaded PTFE- V-ring packing

#### 4.2.1 Preparation for assembling the Valve

Lay the valve body ( 1 ) on a clean surface so that the bearing area of the shaft is within easy reach.

Press in the bearing bushing ( 12a ) as far as it will go into the bearing hole.

Then insert the spacer ( 22 ).



**Note:** Butterfly control valves in nominal sizes DN300 or 12" are assembled without a spacer ( 22 ).

Insert the butterfly disc ( 3 ) into the body so that the bearing holes of the disc are aligned with the bearing hole of the body.

Now insert the shaft ( 2 ) through the bearing holes of the body and the disc.

Push the bearing bushing ( 12b ) as far as it will go over the shaft into the bearing hole of the body.

Then insert the spacer ( 21 ).



**Note:** Butterfly control valves in nominal sizes DN100 or DN 4" are assembled without a spacer ( 21 ).

Screw studs ( 16 ) into the body.

Insert the washer ( 18 ) into the indentation intended for it in the bonnet ( 7 ).

Slide the bonnet seal ( 23 ) as well as the valve body sealing ( 13 ) onto the bonnet.



**Note:** Butterfly control valves in nominal sizes DN300 or 12" are assembled without a bonnet seal ( 23 ).

Insert the previously assembled bonnet into the bearing hole of the body and position correctly with the studs.

Fasten tight the bonnet evenly with nuts ( 17 ) in a criss-cross pattern.

Push the thrust washer ( 8 ) over the shaft's free end at the appropriate place in the body.

Slide the PTFE V-ring packing ( 9 ) together in the sequence PTFE bottom end ring, PTFE V-rings and steel V-ring over the shaft into the body hole and press down using an assembling sleeve.

The arrangement of the V-rings is shown in the detail drawing ( Fig. 3 ).

Slide the spacer ( 15 ) over the shaft and press it into the body at the appropriate place. Proceed in the same manner to add the set of spring washers ( 10 ).

The arrangement of the cup springs is also shown in the detail drawing ( Fig. 3 ).

Press the bearing bushing ( 11 ) into the stuffing box ( 6 ). Carefully place the stuffing box which has just been assembled together onto the intermediate flange and position correctly using the fillister head screws ( 20 ).

Tighten the screws evenly in a criss-cross pattern.

Position the two plane faces of the shaft so that they are parallel to the disc and secure the shaft against further turning.



**Note:** On doing so, make sure that the shaft adjoins the washer ( 18 ).

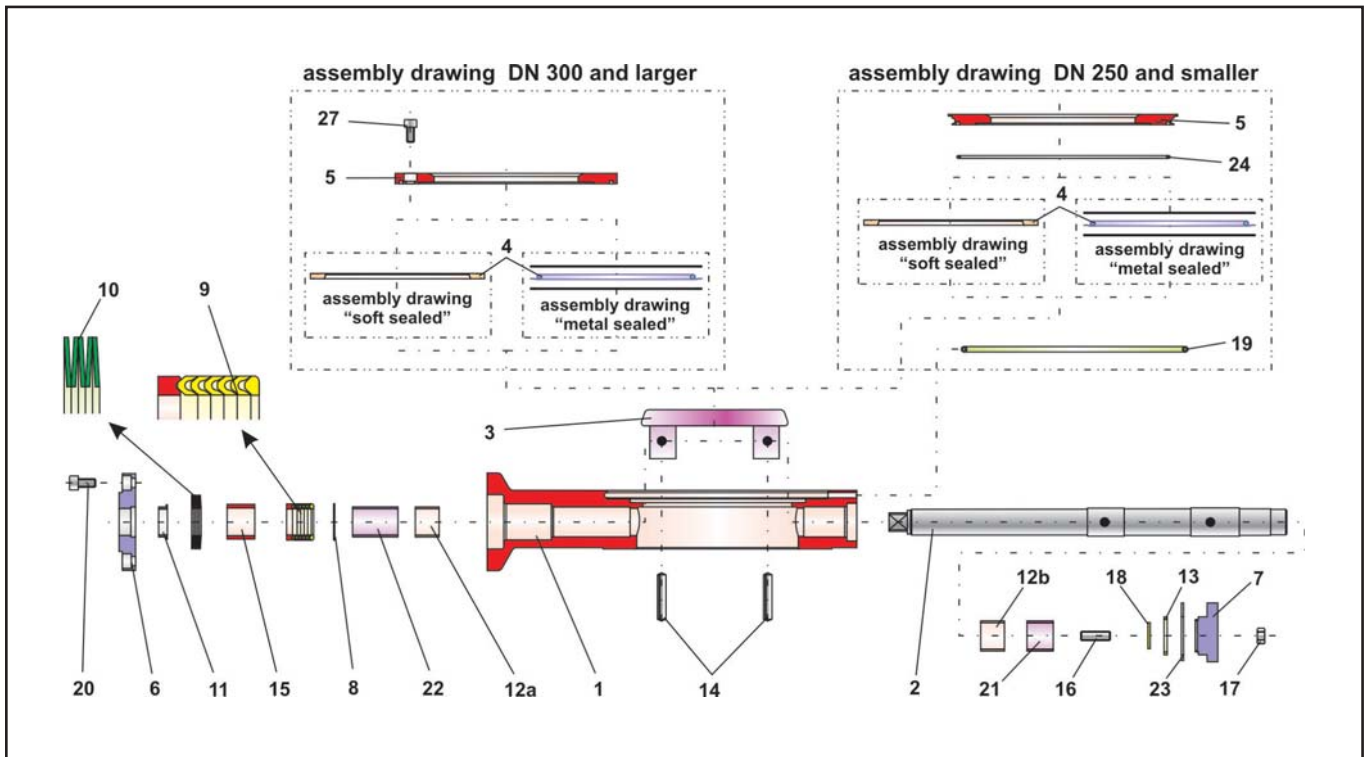


Fig. 3 - Exploded view of the Butterfly Valve Series 14b with live-loaded V-ring packing

Item	Description	Material
1	Valve body	1.4408
2	Shaft	1.4462
3	Valve disc	1.4408
4	Sealing ring	PTFE with glass
	metallic seat ring	Nickel
5	Fastening ring	1.4571
6	Packing box fange	1.4571
7	Bonnet	1.4571
8	Washer	1.4571
9	V-ring packing	1.4305 / PTFE
10	Belleville spring washer	1.8159 / Delta Tone
11	Bushing	PTFE with carbon
12	Bushing	PTFE with glass
13	Body seal	PTFE
14	Grooved pin	1.4462
15	Spacer bushing	1.4571
16	Stud bolt	A2-70
17	Nut	A2-70
18	Lower disc	PTFE
19	Tension spring	1.4310
20	Screw	A2-70
21	Bushing	1.4571
22	Spacer bushing	1.4571
23	Bonnet seal	PTFE with glass
24	O-ring	Viton
26	Screw	A2-70
27	Screw	A2-70

Table 1 - List of parts

Drill fitting holes to connect the shaft to the disc.  
Then connect the disc and shaft using close-tolerance grooved pins ( 14 ).  
Further assembly steps depend on the version concerned.

#### 4.2.2.1 Assembling Butterfly Valves in sizes DN 250 ( 10" ) and smaller

Insert the PTFE-sealing ring or the metallic seat ring ( 4 ) with the graphite rings into the body.



**Note:**

On doing so, make sure that all parts are clean.

Place the O-ring ( 24 ) in the fastening ring ( 5 ).  
Place the previously assembled fastening ring onto the sealing ring and press it in using a hydraulic press.

Loosen the bonnet ( 7 ) again and push the tension spring ( 19 ) into the oblong hole/slot.  
Fasten the bonnet as previously described.

#### 4.2.2.2 Assembling butterfly valves in sizes DN 300 ( 12" ) and larger

Insert the PTFE-sealing ring or the metallic seat ring ( 4 ) with the graphite rings into the body.



**Note:**

On doing so, make sure that all parts are clean.

Place the fastening ring onto the sealing ring and position correctly using the screws ( 27 ).  
Tighten the screws evenly in a criss-cross pattern.

# High Performance Butterfly Valve Series 14b / 14c / 74b

## 4.2.3 Notice of attaching actuating elements



**Note:** Double-eccentric butterfly control valves must always close with a clockwise rotation of the valve shaft!

Therefore observe the direction of rotation when installing the actuator!

A label on the butterfly control valve indicates the direction of rotation.

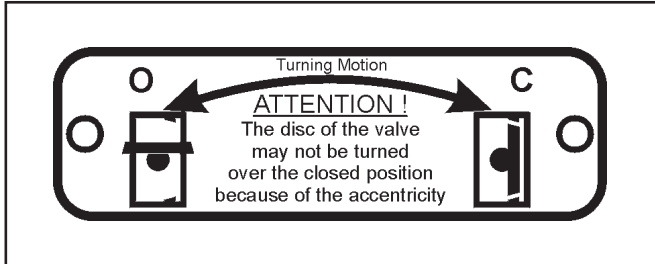


Fig. 4 – Indicating label stating the direction of rotation

**The assembly of the valve is now completed.**

## 4.3 Assembly of the Butterfly Valve Series 14b with adjustable stuffing box flange ( Type WNS )

### 4.3.1 Preparation for assembling the Valve

Lay the valve body ( 1 ) on a clean surface so that the bearing area of the shaft is within easy reach.

Press in the bearing bushing ( 12a ) as far as it will go into the bearing hole. Then insert the spacer ( 22 ).



**Note:** Butterfly valves in nominal sizes DN 300 ( 12" ) are assembled without a spacer ( 22 ).

Insert the butterfly disc ( 3 ) into the body so that the bearing holes of the disc are aligned with the bearing hole of the body. Now insert the shaft ( 2 ) through the bearing holes of the body and the disc.

Push the bearing bushing ( 12b ) as far as it will go over the shaft into the bearing hole of the body.

Then insert the spacer ( 21 ).



**Note:** Butterfly valves in nominal sizes DN 100 ( 4" ) are assembled without a spacer ( 21 ).

Screw studs ( 16 ) into the body.

Insert the washer ( 18 ) into the indentation intended for it in the bonnet ( 7 ).

Slide the bonnet seal ( 23 ) as well as the valve body sealing ( 13 ) onto the bonnet.



**Note:** Butterfly valves in nominal sizes DN 300 ( 12" ) are assembled without a bonnet seal ( 23 ).

Insert the previously assembled bonnet into the bearing hole of the body and position correctly with the studs.

Fasten tight the bonnet evenly with nuts ( 17 ) in a criss-cross pattern.

Push the thrust washer ( 8 ) over the shaft's free end at the appropriate place in the body.

Ring by ring of the PTFE-braided packing ( 9 ) is pushed over the shaft manually and is then pressed into the bore of the casing by means of a special mounting bush.

Press the bearing bushing ( 11 ) into the stuffing box ( 6 ).

Carefully place the stuffing box which has just been assembled together onto the intermediate flange and position correctly using the fillister head screws ( 20 ).

Tighten the screws evenly in a criss-cross pattern.

Position the two plane faces of the shaft so that they are parallel to the disc and secure the shaft against further turning.



**Note :**  
On doing so, make sure that the shaft adjoins the washer ( 18 ).

Drill fitting holes to connect the shaft to the disc.

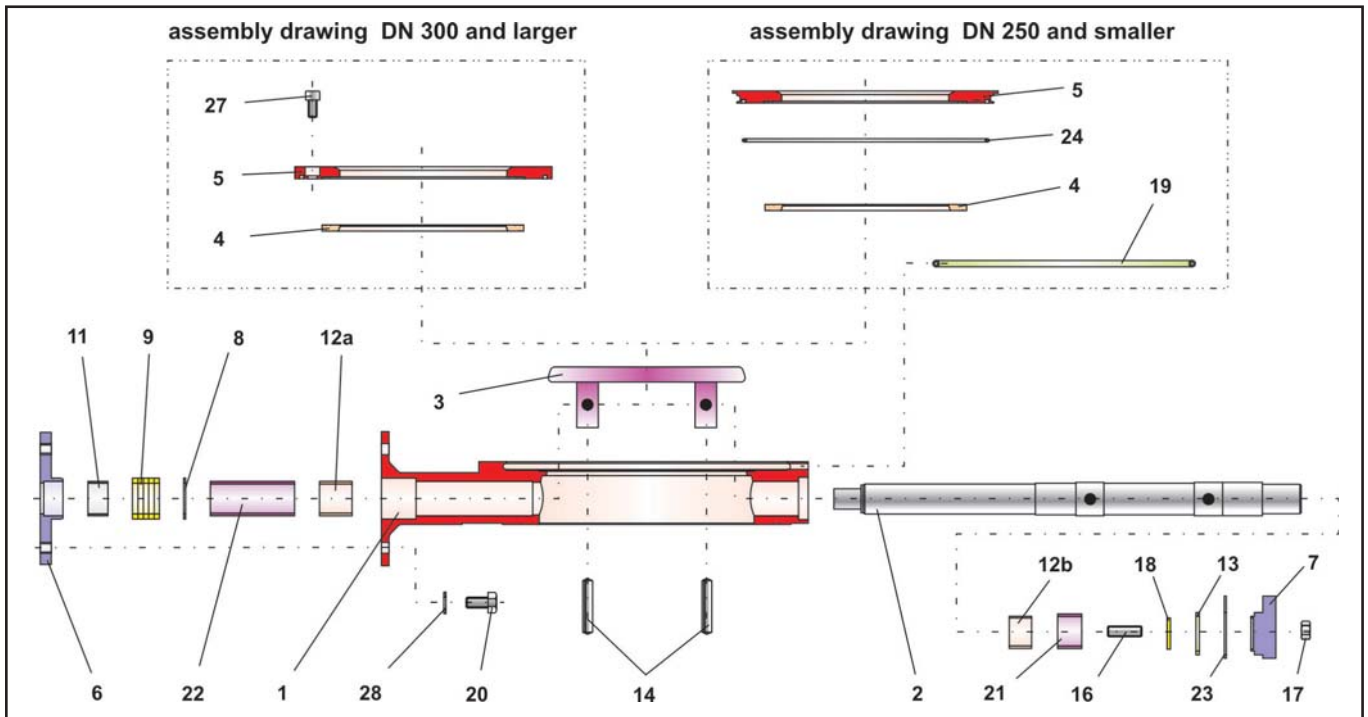


Fig. 5 - Exploded view of the Butterfly Valve Series 14b with adjustable stuffing box flange

Item	Description	Material
1	Valve body	1.4408
2	Valve shaft	1.4542
3	Valve disc	1.4408
4	Sealing ring	PTFE with glass
5	Fastening ring	1.4571
6	Adjustable stuffing box flange	1.4571
7	Bonnet	1.4571
8	Washer	1.4571
9	Braided packing	PTFE
11	Bushing	PTFE with carbon
12	Bushing	PTFE with glass
13	Body seal	PTFE
14	Grooved pin	1.4542
16	Stud bolt	A2-70
17	Nut	A2-70
18	Lower disc	PTFE
19	Tension spring	1.4310
20	Screw	A2-70
21	Bushing	1.4571
22	Spacer bushing	1.4571
23	Bonner seal	PTFE with glass
24	O-ring	Viton
26	Screw	A2-70
27	Screw	A2-70
28	Thrust washer	1.4571

Table 2 - List of parts

Then connect the disc and shaft using close-tolerance grooved pins ( 14 ).  
Further assembly steps depend on the version concerned.

#### 4.3.2.1 Assembling Butterfly Valves in sizes DN 250 ( 10" ) and smaller

Insert the sealing ring ( 4 ) into the body.



**Note:**

On doing so, make sure that all parts are clean.

Place the O-ring ( 24 ) in the fastening ring ( 5 ).  
Place the previously assembled fastening ring onto the sealing ring and press it in using a hydraulic press.

Loosen the bonnet ( 7 ) again and push the tension spring ( 19 ) into the oblong hole/slot.  
Fasten the bonnet as previously described.

#### 4.3.2.2 Assembling butterfly valves in sizes DN 300 ( 12" ) and larger

Insert the sealing ring ( 4 ) into the body.



**Note:**

On doing so, make sure that all parts are clean.

Place the fastening ring onto the sealing ring and position correctly using the screws ( 27 ).  
Tighten the screws evenly in a criss-cross pattern.

# High Performance Butterfly Valve Series 14b / 14c / 74b

## 4.3.3 Notice of attaching actuating elements



**Note:** Double-eccentric butterfly control valves must always close with a clockwise rotation of the valve shaft!

Therefore observe the direction of rotation when installing the actuator!

A label on the butterfly control valve indicates the direction of rotation.

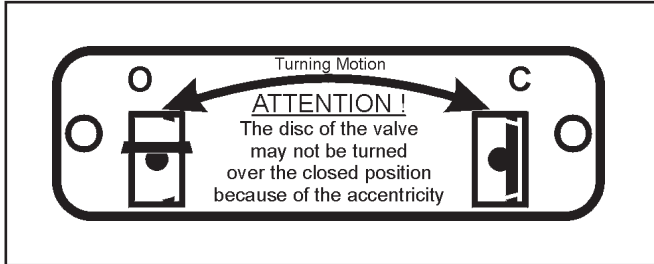


Fig. 6 – Indicating label stating the direction of rotation

**The assembly of the valve is now completed.**

## 4.4 Assembly of the Butterfly Valve Series 14c and Series 74b with live-loaded V-ring packing

### 4.4.1 Preparation for assembling the Valve

Lay the valve body ( 1 ) on a clean surface so that the bearing area of the shaft is within easy reach.

Press in the bearing bushing ( 12a ) as far as it will go into the bearing hole. Then insert the spacer ( 22 ).



**Note:** Butterfly valves in nominal sizes DN 300 ( 12" ) are assembled without a spacer ( 22 ).

Insert the butterfly disc ( 3 ) into the body so that the bearing holes of the disc are aligned with the bearing hole of the body. Now insert the shaft ( 2 ) through the bearing holes of the body and the disc.

Push the bearing bushing ( 12b ) as far as it will go over the shaft into the bearing hole of the body.

Then insert the spacer ( 21 ).



**Note:** Butterfly valves in nominal sizes DN 100 ( DN 4" ) are assembled without a spacer ( 21 ).

Screw studs ( 16 ) into the body.

Insert the washer ( 18 ) into the indentation intended for it in the bonnet ( 7 ).

Slide the bonnet seal ( 23 ) as well as the valve body sealing ( 13 ) onto the bonnet.



**Note:** Butterfly valves in nominal sizes DN 300 ( 12" ) are assembled without a bonnet seal ( 23 ).

Insert the previously assembled bonnet into the bearing hole of the body and position correctly with the studs.

Fasten tight the bonnet evenly with nuts ( 17 ) in a criss-cross pattern.

Push the thrust washer ( 8 ) over the shaft's free end at the appropriate place in the body.

Slide the PTFE V-ring packing ( 9 ) together in the sequence PTFE bottom end ring, PTFE V-rings and steel V-ring over the shaft into the body hole and press down using an assembling sleeve.

The arrangement of the V-rings is shown in the detail drawing ( Fig. 7 ).

Place the intermediate flange ( 25 ) on the body and position correctly using the fillister head screws ( 26 ).

Tighten the screws evenly in a criss-cross pattern.

Slide the spacer ( 15 ) over the shaft and press it into the body at the appropriate place.

Proceed in the same manner to add the set of spring washers ( 10 ). The arrangement of the cup springs is also shown in the detail drawing ( Fig. 7 ).

Press the bearing bushing ( 11 ) into the stuffing box ( 6 ).

Carefully place the stuffing box which has just been assembled together onto the intermediate flange and position correctly using the fillister head screws ( 20 ).

Tighten the screws evenly in a criss-cross pattern.

Position the two plane faces of the shaft so that they are parallel to the disc and secure the shaft against further turning.



**Note:** On doing so, make sure that the shaft adjoins the washer ( 18 ).

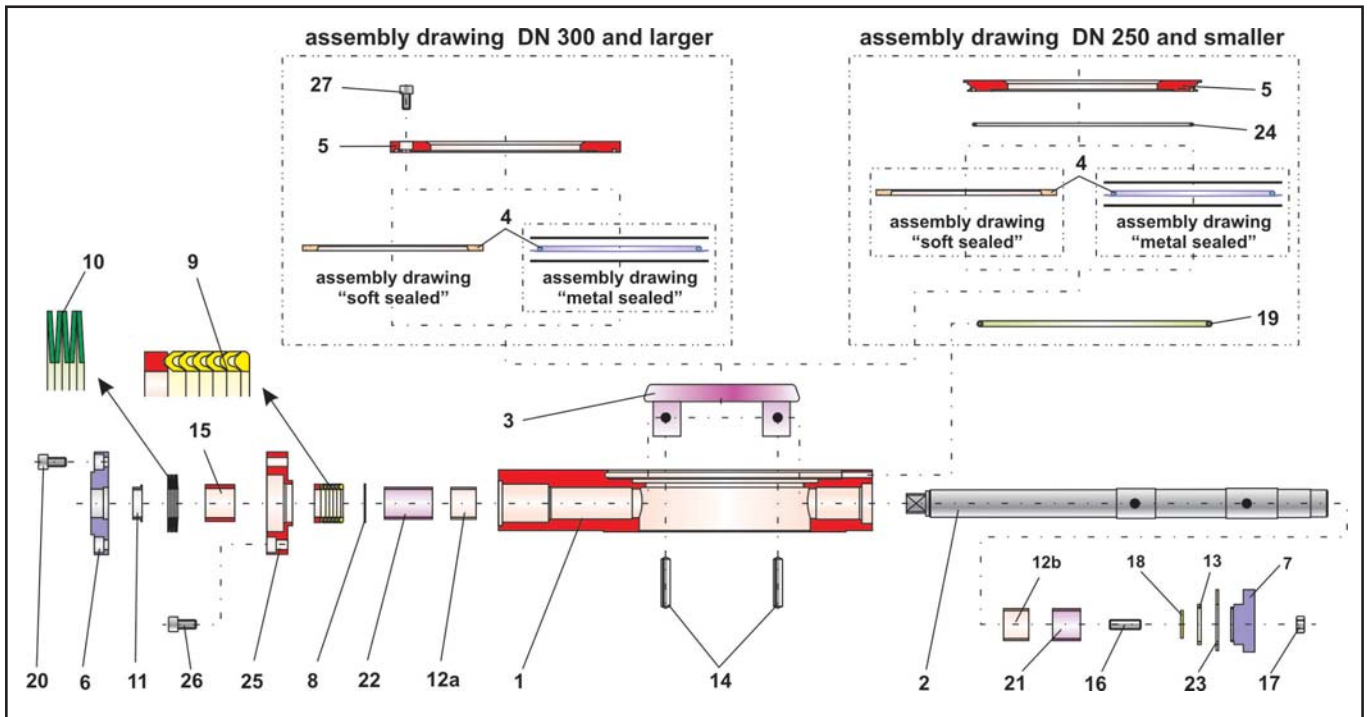


Fig. 7 - Exploded view of the Butterfly Valve Series 14c/ 74b with live-loaded V-ring packing

Item	Description	Material
1	Valve body	1.4408
2	Shaft	1.4462
3	Valve disc	1.4408
4	Sealing ring	Nickel
	metallic seat ring	PTFE with glass
5	Fastening ring	1.4408
6	Packing box fange	1.4571
7	Bonnet	1.4571
8	Washer	1.4571
9	V-ring packing	1.4305 / PTFE
10	Belleville spring washer	1.8159 / Delta Tone
11	Bushing	PTFE with carbon
12	Bushing	PTFE with glass
13	Body seal	PTFE
14	Grooved pin	DIN 1472, 1.4462
15	Spacer bushing	1.4571
16	Stud bolt	DIN 938, A2-70
17	Nut	DIN 934, A2-70
18	Lower disc	PTFE
19	Tension spring	1.4310
20	Screw	DIN 912, A2-70
21	Bushing	1.4571
22	Spacer bushing	1.4571
23	Bonnet seal	PTFE with glass
24	O-ring	Viton
25	Intermediate flange	1.4305
26	Screw	DIN 912, A2-70
27	Screw	DIN 912, A2-70

Table 3 - List of parts

Drill fitting holes to connect the shaft to the disc. Then connect the disc and shaft using close-tolerance grooved pins ( 14 ). Further assembly steps depend on the version concerned.

#### 4.4.2.1 Assembling Butterfly Valves in sizes DN 250 ( 10" ) and smaller

Insert the metallic seat ring ( 4 ) with the graphite rings into the body.



**Note:**

On doing so, make sure that all parts are clean.

Place the O-ring ( 24 ) in the fastening ring ( 5 ). Place the previously assembled fastening ring onto the sealing ring and press it in using a hydraulic press.

Loosen the bonnet ( 7 ) again and push the tension spring ( 19 ) into the oblong hole/slot. Fasten the bonnet as previously described.

#### 4.4.2.2 Assembling butterfly valves in sizes DN 300 ( 12" ) and larger

Insert the metallic seat ring ( 4 ) with the graphite rings into the body.



**Note:**

On doing so, make sure that all parts are clean.

Place the fastening ring onto the sealing ring and position correctly using the screws ( 27 ). Tighten the screws evenly in a criss-cross pattern.

#### 4.4.3 Notice of attaching actuating elements



**Note:** Double-eccentric butterfly control valves must always close with a clockwise rotation of the valve shaft!

Therefore observe the direction of rotation when installing the actuator!

A label on the butterfly control valve indicates the direction of rotation.

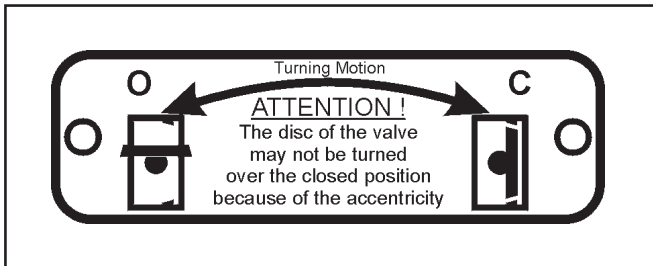


Fig. 8 – Indicating label stating the direction of rotation

**The assembly of the valve is now completed.**

#### 5. Malfunctions and their elimination

Assistance in the case of malfunctions is provided in the **operating instructions**

< BA 14b-01\_EN > for automatic Butterfly valves, resp.  
< BA 14b-02\_EN > for manually-operated butterfly valves under section 7.

#### 6. Repair of the butterfly valve

##### 6.1 Exchange of the packing

If a leak is detected at the stuffing box, the PTFE rings of the packing ( 9 ) may be defect.

It is recommendable to check the condition of the packing. To remove the packing, the valve is disassembled in the reverse order to that described in chapter 3.

The PTFE rings of the packing are, together with all plastic parts, checked for damage and, in case of doubt, exchanged.

##### 6.2 Exchange of the sealing ring

If the butterfly valve is untight in the bore, the sealing ring ( 4 ) may be defect.

It is recommendable to check the condition of these components. To remove the sealing ring, the valve is disassembled in the reverse order to that described in chapter 3.

The sealing ring are, together with all plastic parts, checked for damage and, in case of doubt, exchanged.

##### 6.3 Further repair work

In case of further more serious damage, we recommend the repair work to be carried out by Pfeiffer.

#### 7. Queries to the manufacturer

(in case of queries please provide following information)

1. Order number (embossed on the type plate)
2. Type, product number, nominal diameter and design of butterfly valve
3. Pressure and temperature of the flow medium
4. Flow rate in m<sup>3</sup>/h
5. Drawing of installation, if possible

**For your special requirements please contact our technical sales department.**

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