

# Maintenance

## Ball Valve Series 20b



Fig. 1 – Ball valve Series 20b with AT - Actuator Series 31a



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.

### 1. Design, operation and dimensions

Design, operation and dimensions as well as all further details and technical data may be found in the **data sheet** < TB 20b\_EN >.

### 2. Installation, start-up and maintenance

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

< BA 20a-01\_EN > for pneumatic ball valves, resp.

< BA 20a-02\_EN > for hand-operated ball valves.

### 0. Introduction

These instructions are intended to support the user in the assembly and repair of ball valves of the Series 20b.

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.

The transfer of these instructions to third parties is only allowed with the written approval of Pfeiffer Chemie-Armaturenbau GmbH.

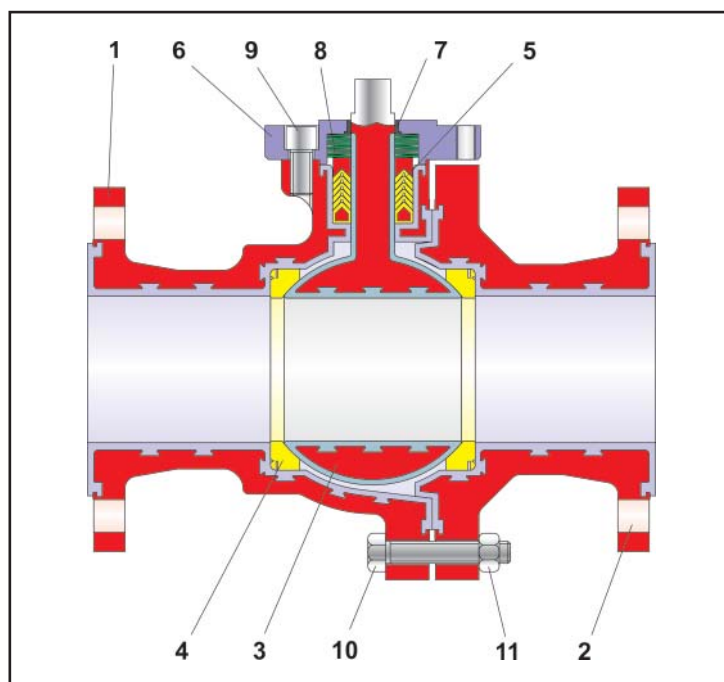


Fig. 2 – Cross-section through a ball valve Series 20b => for parts list see table 1 on page 2

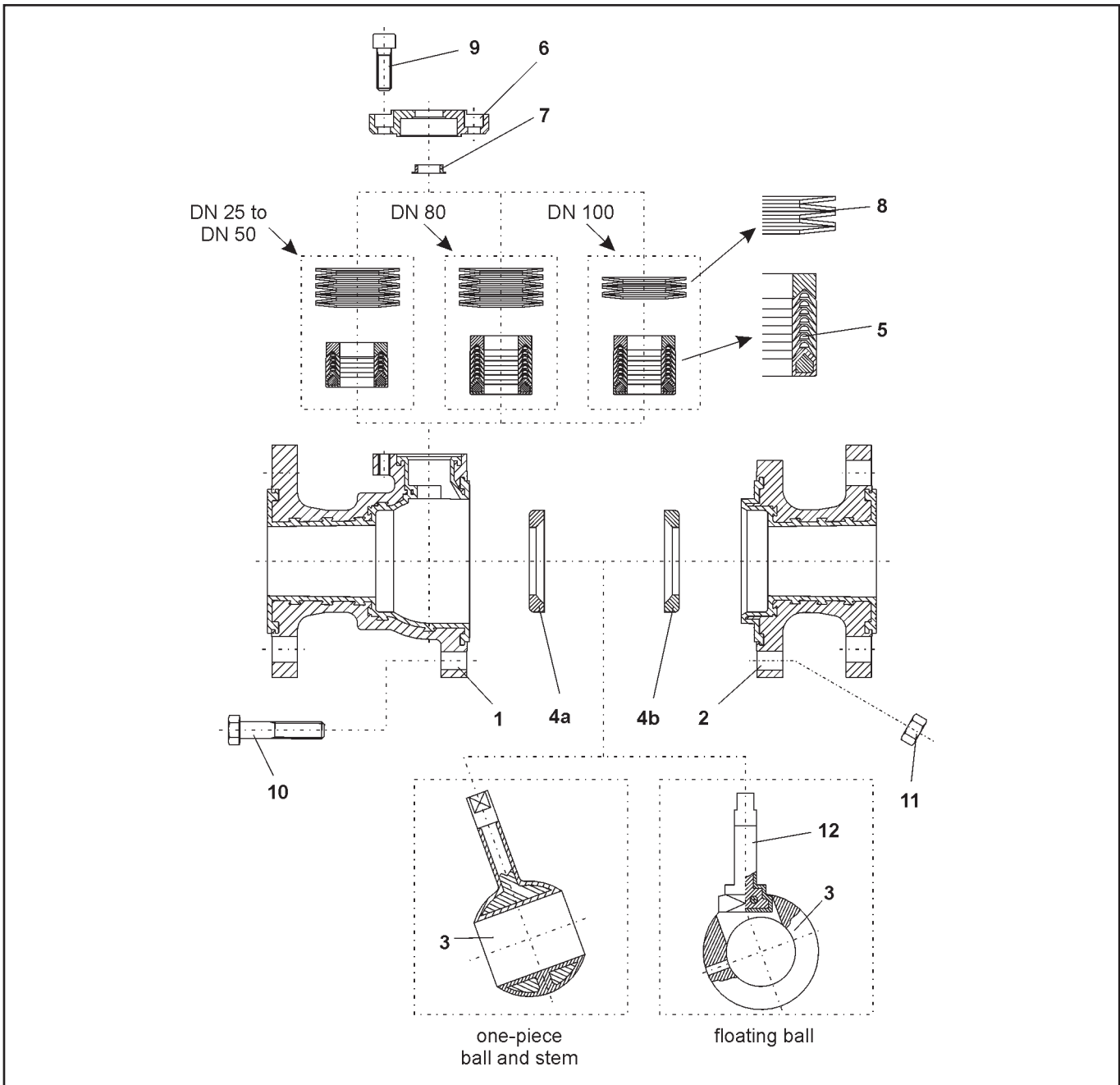


Fig. 3 – Detail drawing of the ball valve Series 20b

Item	Description	Material
1	Body and lining	0.7043 / PFA
2	Body	0.7043 / PFA
3	Ball with shaft	1.4313 / PFA
4	Seatring	PTFE
5	V-ring packing	1.4305 / PTFE
6	Stuffing box	1.4305

Item	Description	Material
7	Bearing bushing	PTFE mit 25% Kohle
8	Set of spring washers	1.8159 / Delta Tone
9	Screw	A2-70
10	Screw	A2-70
11	Nut	A2-70
12	Shaft	1.4313 / PFA

Table 1 – Parts list and materials of construction

### 3. Assembly of the ball valve

#### 3.1 Preparation for the assembly

In order to assemble the ball 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 detail drawing (Fig. 3) are to be observed during assembly.

**The Ball valve from Series 20b is generally subdivided into two different types :**

- **Type A:** one-piece ball and stem
- **Type B:** floating ball

As both models are identical in dimension, they can both be updated or modified at a later point of time.

#### 3.2 Assembling Instructions for Type A

First, the basic body ( 1 ) of the valve has to be placed on its face on the soft surface.

The seating ( 4a ) should now be fed into the body ( 1 ).

Now the one-piece ball and shaft ( 3 ) should be fed slantwise through the stem drilling hole in the basic body ( 1 ).



**Note:** To have an unproblematic assembling take care that the flow direction of ball and shaft are in one direction.

Notice that at DN 100 / 4" the chamfer of the stem shows at assembling to the inner side of the body.

Now the lateral body ( 2 ) should be fitted with the Seating ( 4b ) and can now be placed into the basic body ( 1 ) using the hexagon nuts ( 11 ) and bolts ( 10 ) screwed hand tight together.

Now, using a special tool, (tube, outside diameter less the diameter of the PTFE-V-ring packing but greater than the stem diameter), the ball shaft gets centred in the basic body through feeding the bottom ring of the PTFE-V-ring packing ( 5 ) into its drilled hole.

Because of the oval form of the drilled hole, low force should be used to fix the ring in its place.

Following all V-rings have to be placed one by one over the shaft. At this point, all the hexagonal nuts and bolts can be tighten to their respective torque values (shown bellow).

Now the disks springs ( 8 ) can be fed onto the upper packing ring ( 5 ) and the stuffing box ( 6 ) must be prepared by placing the bushing ( 7 ) into its bedding.

When this is complete, the stuffing box ( 6 ) can now be placed over the ball stem ( 3 ), being careful that the spring washers ( 8 ) are central.

Now the stuffing box ( 6 ) with the bushing ( 7 ) can be screwed on to the valve body using the socket head screws ( 9 ) which should also be equally and tightly fastened in case of the later installation of an actuator.

If required, it is also possible to attach a hand lever.

#### 3.3 Mounting Instructions for Model B

Generally, the mounting instructions are identical to Model A, except that the ball ( 3a ) and the stem ( 12 ) are two separate items.

According to this difference, first the shaft ( 12 ) has to be placed in the basic body ( 1 ) by moving it through the drilled hole, than the ball ( 3 ) can be fed into the body if the dihedron of the shaft and the groove of the ball fit into one another.

Now, the rest of the assembling can take place as of Model A.

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

#### 3.4 Tightening torques to connect the body sections

On connecting the body sections together, the sequence for securing bolts and the tightening torques for each nominal size must be strictly observed.

Nominal size	Connection	Tightening torque
DN 15	1 bis 4	25 Nm
DN 25	1 bis 6	30 Nm
DN 40	1 bis 7	30 Nm
DN 50	1 bis 7	30 Nm
DN 80	1 bis 13	40 Nm
DN 100	1 bis 14	40 Nm

Table 2 - Tightening torque

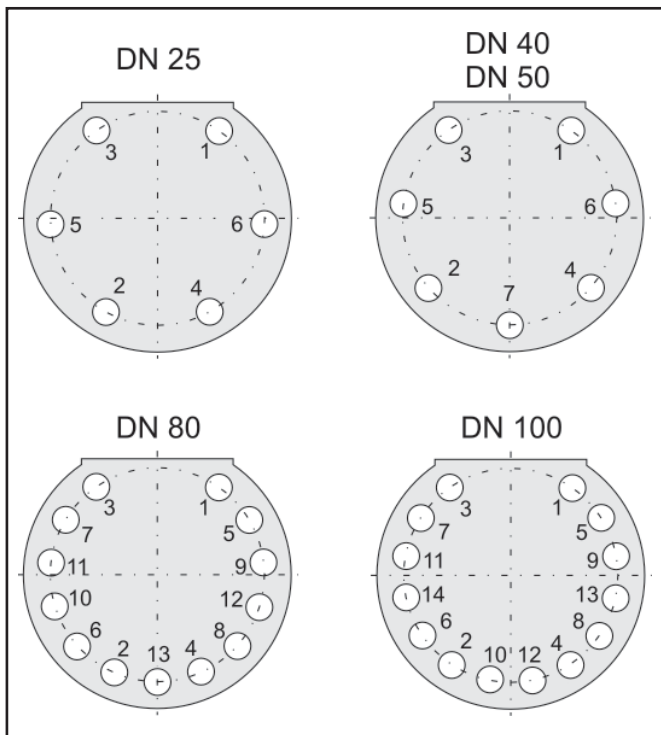


Fig. 4 - Sequence for securing the bolts

#### 4. Malfunctions and their elimination

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

< BA 20a-01\_EN > for automatic ball valves, resp.

< BA 20a-02\_EN > for manually-operated ball valves under section 7.

#### 5. Repair of the ball valve

##### 5.1 Exchange of the packing

If a leak is detected at the stuffing box, the PTFE rings of the packing ( 5 ) 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.

##### 5.2 Exchange of the sealing unit and the ball

If the ball valve is untight in the bore, the sealing ring set (4a and 4b) and the ball ( 3 ) may be defect. It is recommendable to check the condition of these components.

To remove the sealing rings and the ball, the valve is disassembled in the reverse order to that described in chapter 3. The sealing rings and the ball are, together with all plastic parts, checked for damage and, in case of doubt, exchanged.

##### 5.3 Further repair work

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

#### 6. 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 ball valve
3. Pressure and temperature of the flow medium
4. Flow rate in m<sup>3</sup>/h
5. Drawing of installation, if possible