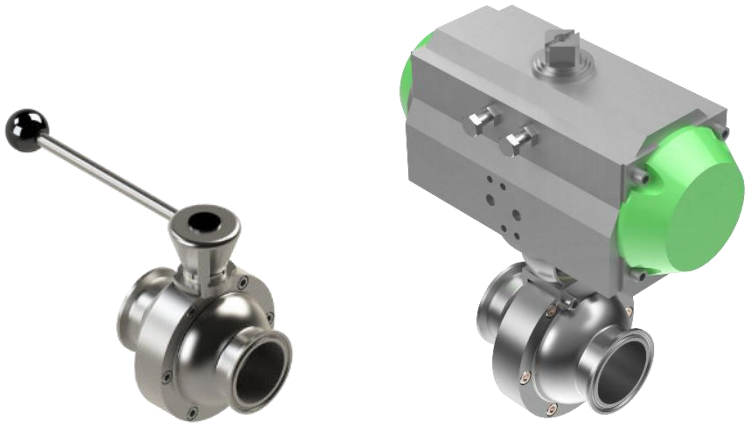
2-PC Ball Valve

2-Way



Instruction Manual

10202605-IM015

CONTENTS

1 General Description

This manual should be read carefully by all personnel involved in operation and maintenance.

Liability for any damages or issues resulting from non-compliance with these instructions will not be accepted.

It should also be noted that descriptions and specifications in this manual may be subject to technical changes.

1.1 Intended use

The ball valve is designed for the purposes outlined in Chapter 2.1. Any use beyond what is described in that chapter does not adhere to regulations, and MST (Minox) will not be held responsible for any resulting damages. The operator assumes full responsibility for risks.

Proper and safe operation of the ball valve requires appropriate transportation, storage, and professional assembly. Intended use also includes adherence to operating, service, and maintenance guidelines.

1.2 Storage

The ball valve should be stored in accordance with the following conditions:

- Storage area should be clean and dry at all times.
- Store the valve in a temperature-controlled area to protect gasket.
- Store the valve in a box and protect the inlet and outlet with end caps to prevent rust and contamination by foreign materials.
- Storage area should be checked periodically to ensure that these conditions are consistently maintained.

2 MINOX® 2-PC Ball Valve

2.1 Purpose of use

MINOX® 2-piece body sanitary ball valve is particularly used for applications involving high-viscosity fluids due to its smooth internal surfaces, which help reduce flow resistance and ensure the easy passage of thicker fluids. Its compact structure allows for simple installation and efficient flow control.

2.2 Features

The key features of MINOX® 2-piece body sanitary ball valve include:

- **Compact and simple body design** with fewer components, making the valve easy to operate and maintain.
- **Easy installation and operation** allows quick installation in piping systems and simple operation using a handle or actuator.
- **Full-bore design** provides an unobstructed flow path for maximum discharge efficiency, minimizing pressure drop and reducing the potential for blockages.
- **Compatible with pneumatic actuator** enables automated operation and improved process control.

3 Technical Data

Material	
Body	SS316
Stem Seal	PTFE
Ball Seal	PTFE
Body Seal	Silicone

Working Condition	
Maximum working temperature	-10°C to 95°C
Maximum working pressure	10 bar

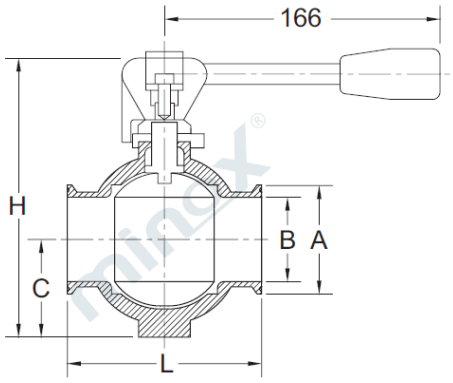
Physical Data	
Process connection	Clamp end (Weld end, SMS, DIN, RJT, IDF connections available on request)
Size	1” – 4”

Operation Type	
Manual	Manual with Handle
Auto	Pneumatic actuator
Control option	Solenoid valve, positioner, limit switch

Pneumatic Data	
Air quality	Class 3,3,3 acc. to DIN ISO 8573-1
Air pressure for actuator	5 – 7 bar

3 Technical Data

Dimension

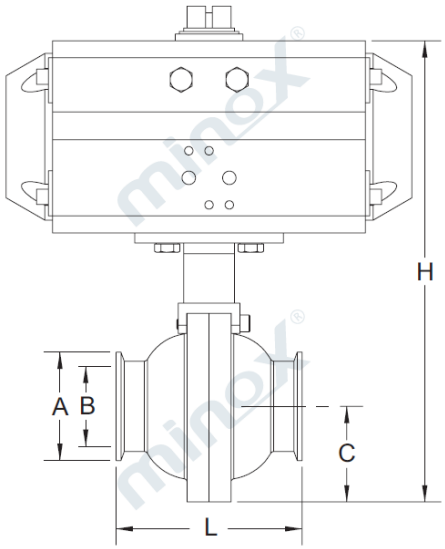


2-PC Manual Ball Valve

Size (Inch)	A (mm)	B (mm)	C (mm)	H (mm)	L (mm)
1.0″	50.5	22.2	38.0	124	95.0
1.5″	50.5	34.9	47.0	142	101.0
2.0″	64.0	47.6	56.0	160	110.0
2.5″	77.5	60.3	65.5	179	124.0
3.0″	91.0	73.0	75.5	199	143.0
4.0″	119.0	97.6	91.5	231	183.6

3 Technical Data

Dimension



2-PC Pneumatic Ball Valve

Size (Inch)	A (mm)	B (mm)	C (mm)	H (mm)	L (mm)
1.0”	50.5	22.2	38.0	206.5	95.0
1.5”	50.5	34.9	47.0	256.0	101.0
2.0”	64.0	47.6	56.0	274.0	110.0
2.5”	77.5	60.3	65.5	305.0	124.0
3.0”	91.0	73.0	75.5	325.0	143.0
4.0”	119.0	97.6	91.5	378.5	183.6

4 Installation

1. Before installation, clean and flush the valve thoroughly while it is in the fully open position to ensure all internal surfaces are free of contaminants.

2. The pipeline must be completely flushed and free of debris, welding slag, or impurities. Any contaminants left in the pipeline can permanently damage the ball or the seal.

3. The ball valve is designed for versatility and may be installed in either a horizontal or vertical orientation.

4. The pipeline must be properly aligned and should not sag, bend, or be subjected to external forces. Use pipe hangers to support the pipeline and eliminate misalignment or deviation near the valve installation point.

5. Avoid stressing the valve to mechanical or thermal stress during installation. Attention should be given to the following:
   - Vibration on the pipeline.
   - Thermal expansion of the pipeline during circulation of hot liquids.
   - Excessive welding.
   - Overloading on the pipeline.

6. When connecting the valve to the pipeline, place the sanitary gasket squarely into the ferrule groove of the valve connection to ensure a leak-proof seal.

7. Align the two ferrule ends (valve and pipeline) and secure them with a clamp ring. Tighten the clamp until the connection is firm and leak-proof.

Note:
Do not overtighten, as this may distort the gasket.

8. Operate the handle or actuator several times to ensure smooth and reliable movement between the ball and the seat.

9. Perform a leak test at operating pressure before commencing full production.

5 Operation

Before first start-up

1. Clean the piping system thoroughly to ensure that no foreign objects are trapped inside.
2. Inspect the system for possible leakages during commissioning. Replace any defective seals immediately.

5.1 Manual operation

Manual operation using the handle is shown in *Figure 5.1.1*. Rotate the handle by 90° to fully open or close the valve.

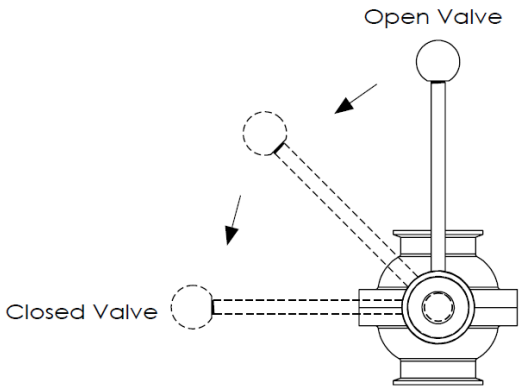


Figure 5.1.1: Manual operation of 2-pc ball valve.

5 Operation

5.2 Pneumatic operation

Pneumatic operation using the actuator is shown in *Figure 5.1.2*. Apply compressed air to the pneumatic actuator to operate the valve. Valve position can be displayed if a limit switch box is installed.

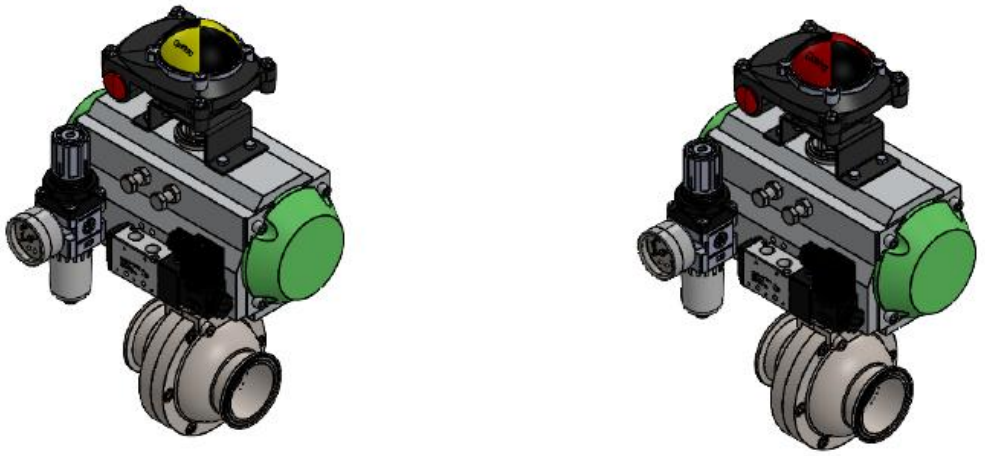
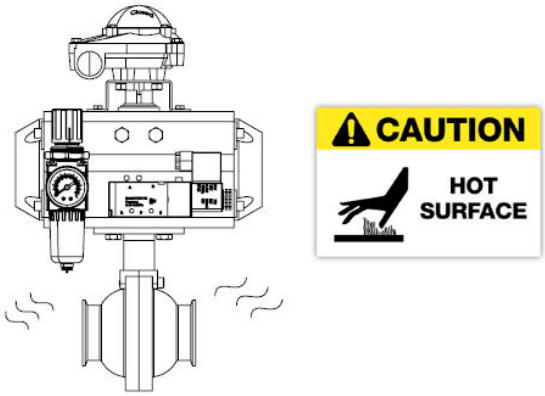


Figure 5.2.1: Pneumatic operation of 2-pc ball valve.

Notes:

1. *Operate the valve by opening and closing it several times to ensure smooth and reliable movement between the ball and the seat.*
2. *Ensure smooth operation of the actuator.*



Caution!

- Do not touch the valve body and the actuator when it is in charged with compressed air.
- Do not touch the valve or piping when handling hot liquids or during sterilization.
- Release the compressed air after use.

6 Maintenance

6.1 General maintenance

Read the maintenance instruction carefully. Always keep the spare service kits in stock for any necessary replacement. Always use MINOX genuine spare parts. Table 6.1.1 shows the recommended action for maintenance.

Table 6.1.1: Maintenance guide for valve.

Recommended Action	Maintenance of Stem Seal, Ball Seal & Body Seal
Preventive maintenance	- Replace after 12 months.
Maintenance after leakage	- Replace immediately.
Planned maintenance	- Regular inspection for leakage and smooth operation. - Keep a track record of the valve operation. - Use statistic for inspection planning. - Replace after leakage.

Note:
Contact MINOX sales personnel to order spare service kits which can be found in the Chapter 9 Spare Part List.

Caution!
Before disassembling the valve's pipeline connections and clamps on the valve body, always take the following safety measures:

- Release the compressed air after use.
- Never service the valve when it is hot. Risk of burns!
- Never service the valve while the valve and pipeline are pressurized.
- Do not touch the valve body and the actuator when it is in charged with compressed air.
- Do not stick your fingers through the valve ports if the actuator is supplied with compressed air.
- Disconnect electric and pneumatic connections.
- Ensure that no process operations are running in the relavant area during maintenance and repair.
- All pipeline system components connected to the valve must be completely drained.

6 Maintenance

6.2 Recommended cleaning

Sanitary ball valves contain seat cavities and shadow areas that cannot be completely cleaned by CIP flow alone. Therefore, it is strongly recommended to perform COP (clean-out-of-place) before initiating the CIP (clean-in-place) process.

During COP, the valve shall be disassembled, and all product contact parts – including the ball, seats, and stem cavities shall be manually cleaned using approved cleaning agents. After thorough cleaning, rinsing, and inspection, the valve shall be properly reassembled and reinstalled into the pipeline.

Following COP, the CIP process shall be carried out to clean the connected pipeline system. During CIP, the valve passages are cleaned by circulating cleaning solution through the system. The choice of cleaning agents, exposure time, temperature, and procedures shall be determined based on the type and level of contamination. Ensure that the cleaning solution is chemically compatible with the sealing materials used.

1. Prepare 1% weight concentration of NaOH at 70℃.
   For example,
   NaOH (1kg) + water (100L) = alkaline cleaning agent

2. Prepare 0.5% weight concentration of HNO3 at 70℃.
   For example,
   53% HNO3 (0.7L) + water (100L) = acid cleaning agent

   Note:
   Use clean water free from chlorides.

3. The cleaning agent concentration should not be too high. Please add the cleaning agent gradually!

4. Adjust the cleaning agent flow rate according to the process. Increase the cleaning flow rate for milk/viscous liquid disinfection.

5. After cleaning, rinse with clean water.

Caution!
Always handle alkaline and acid with safety goggles and gloves.
Never touch the valve or pipeline when processing hot medium or sterilisation. Risk of burns!

Notes:
1. *Cleaning agents must be stored/handled in accordance with current regulations/standard.*
2. *Above are the details on common CIP chemicals and general guidelines for use. It is recommended you contact your CIP engineering partner to purchase chemicals that are right for your needs.*

7 Troubleshooting

Failures	Cause	Remedy
Internal leakage (normal wear)	- Worn ball seal and body seal	- Replace the ball seal and body seal
Internal leakage (early stage)	- Worn ball seal and body seal - Many activations - High pressure and/or temperature - Aggressive media	- Replace the ball seal and body seal - Change operating conditions
External leakage (normal wear)	- Worn stem seal	- Replace the stem seal
External leakage (early stage)	- Damaged or worn stem seal - Many activations - High pressure and/or temperature - Aggressive media	- Replace the stem seal - Change operating conditions
Valve cannot be activated or is difficult to operate	- Too low air pressure	- Check the correct air pressure
Valve is NO (normally open), should be NC (normally closed)	- 90° displacement of the actuator	- Remove the actuator, turn valve into desired pressure-less position and remount actuator.

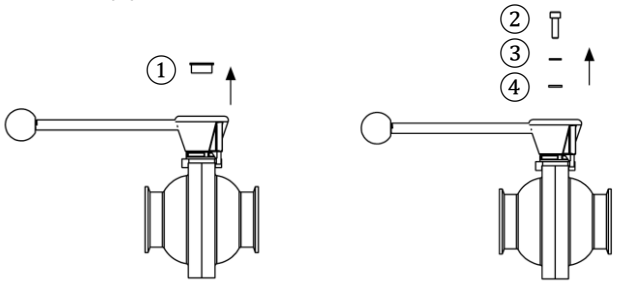
Note:
Contact MINOX sales personnel if technical assistance is required.

8 Valve Assembly & Disassembly

8.1 Valve disassembly

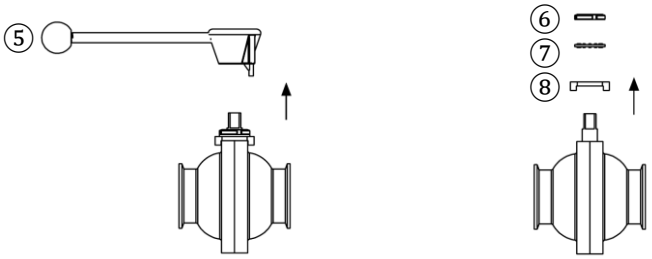
Step 1

- Remove the cover (1) from the handle (5).
- Loosen the screw (2), then remove the following components from the handle (5):
  - screw (2)
  - spring washer (3)
  - washer (4)



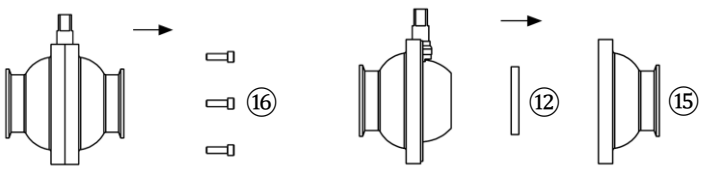
Step 2

- Remove the handle (5) from the valve body.
- Remove the following components from the valve body:
  - gland nut (6)
  - thrust ball bearing (7)
  - mount (8)



Step 3

- Loosen and remove the cap screws (16) from the valve body.
- Remove the valve body half (15 or 15a) and ball seal (12).

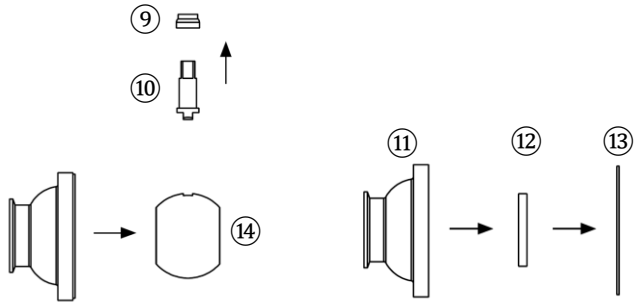


8 Valve Assembly & Disassembly

8.1 Valve disassembly

Step 4

- Remove the stem seal (9), stem (10) and ball (14).
- Remove the body seal (13) and ball seal (12) from the valve body half (11 or 11a).

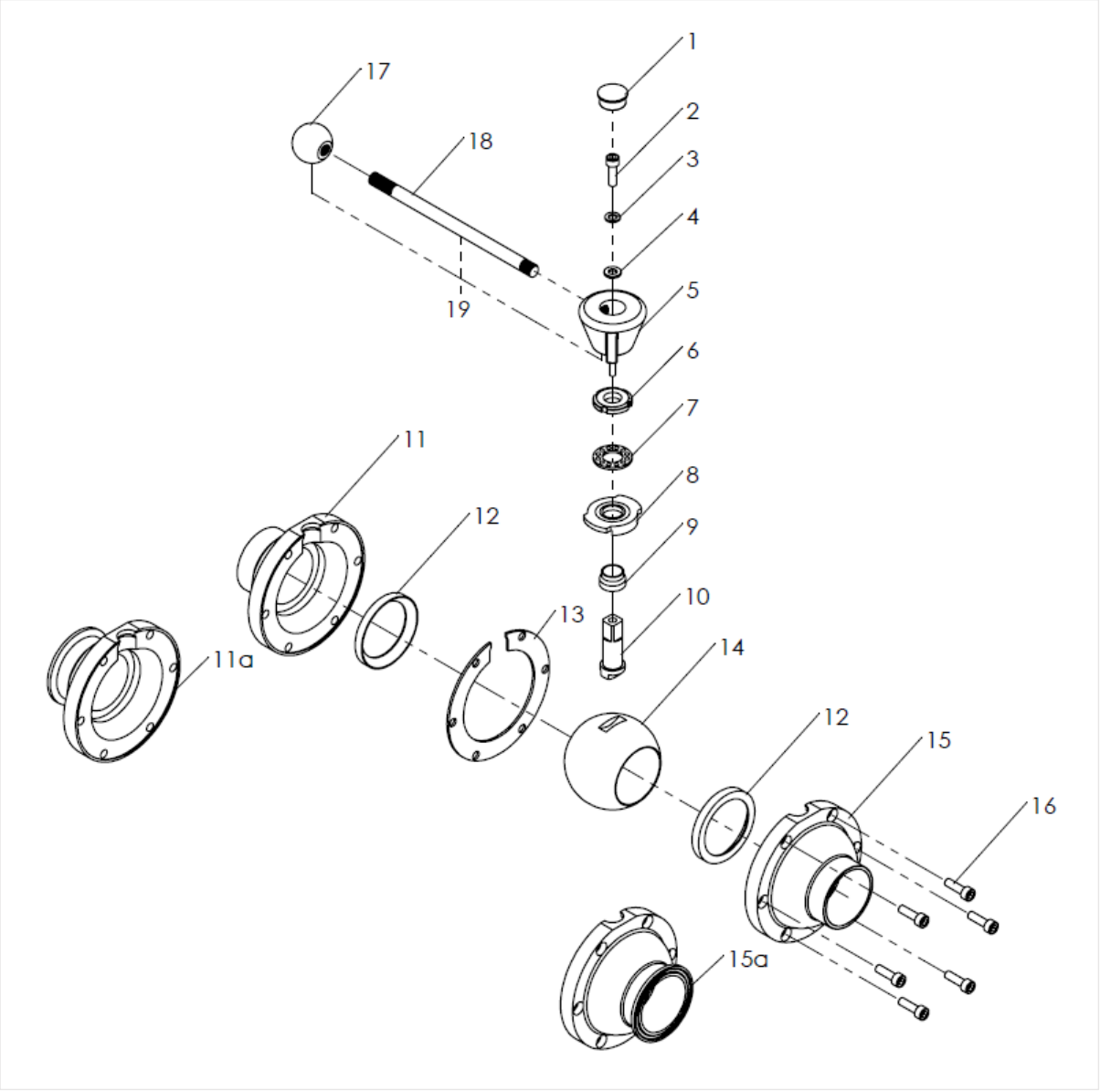


8.2 Valve assembly

Reassemble the valve by performing the disassembly steps in reverse order.

9 Spare Part List

9.1 2-pc manual ball valve



9 Spare Part List

9.1 2-pc manual ball valve

No.	Part Name	Qty.	Material
1	Cover	1	
2	Screw	1	
3	Spring washer	1	
4	Washer	1	
5	Handle block	1	304
6	Gland nut	1	304
7	Thrust ball bearing	1	
8	Mount	1	304
9*	Stem seal	1	PTFE
10	Stem	1	316
11	Valve body, half 2 – weld end	1	316
11a	Valve body, half 2 – clamp end	1	316
12*	Ball seal	2	PTFE
13*	Body seal	1	Silicone
14	Ball	1	316
15	Valve body, half 1 – weld end	1	316
15a	Valve body, half 1 – clamp end	1	316
16	Screw	①	
17	Nylon ball	1	Nylon
18	Rod	1	304
19	Handle set (5, 17 & 18)	1	304

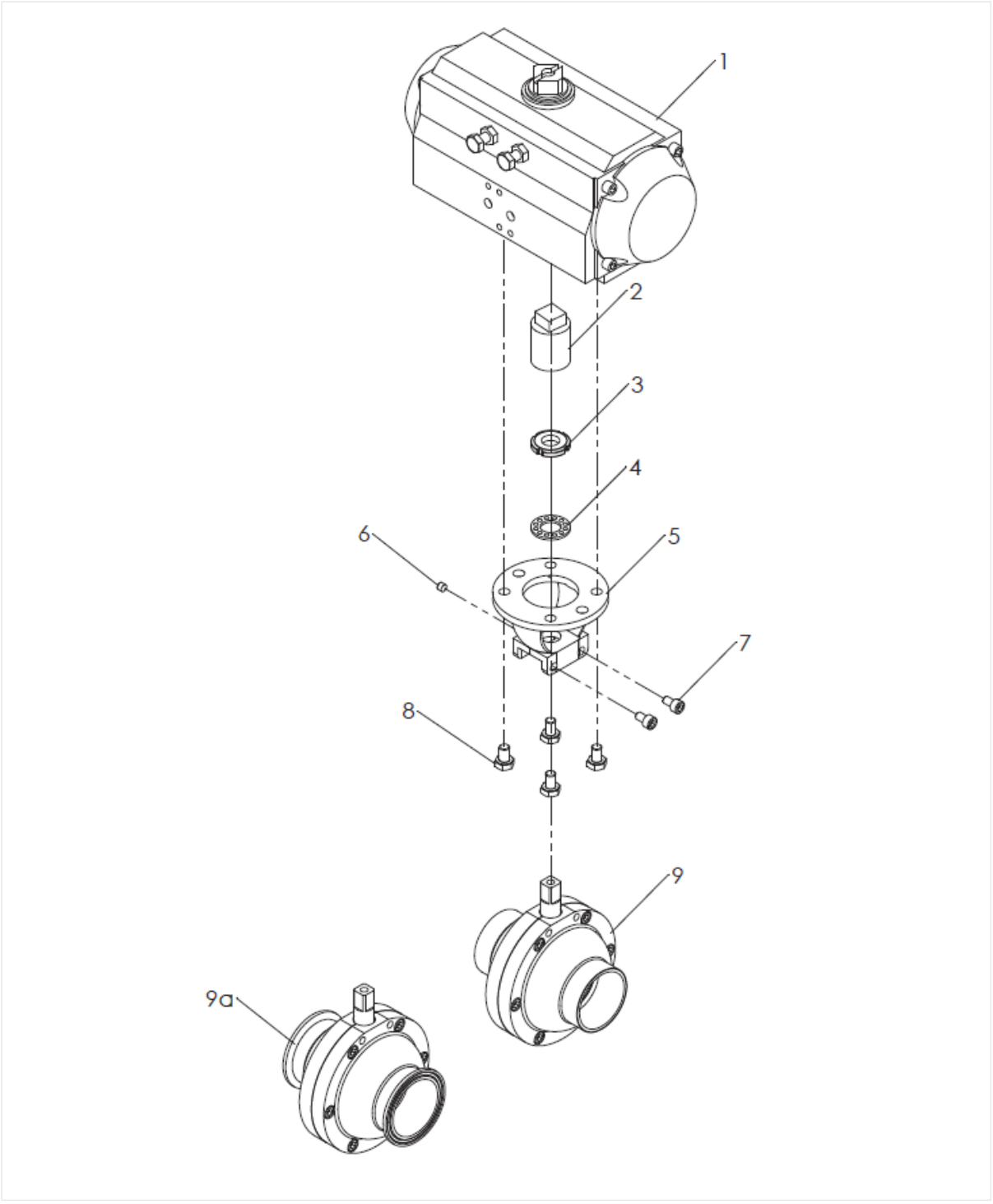
SERVICE KIT
Parts marked with * are the service kit.

SERVICE KIT	1" (25.4mm)	1.5" (38.1mm)	2" (50.8mm)	2.5" (63.5mm)	3" (76.2mm)	4" (101.6mm)
Silicone + PTFE	2B001-05508	2B001-05512	2B001-05516	2B001-05520	2B001-05524	2B001-05532

Note:
① *The required quantity depends on the valve size.*

9 Spare Part List

9.2 2-pc pneumatic ball valve



9 Spare Part List

9.2 2-pc pneumatic ball valve

No.	Part Name	Qty.	Material
1	Actuator-1, complete (NO/NC) Actuator-2, complete (DA)	1	
2	Coupling-1 (NO/NC) Coupling-2 (DA)	1	304
3	Gland nut	1	304
4	Thrust ball bearing	1	
5	Bracket	1	304
6	Socket set screw – cone point	1	
7	Screw	2	
8	Hex screw-1 (NO/NC) Hex screw-2 (DA)	4	
9	2-pc ball valve – weld end	1	316
9a	2-pc ball valve – clamp end	1	316

SERVICE KIT

Service kit for 2-pc ball valve refer to page 18.

The information provided in this manual is intended for general guidance and should be used in accordance with the instructions provided.

MST Stainless Steel Sdn Bhd (Minox) reserves the right to make changes to the design and materials of this product at any time without prior notification.

For customer support or additional information, please contact our sales representative in your region or visit our website at www.minox.biz.

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