

Type 2006

3/2-Way Globe Valve

3/2-Wege-Geradsitzventil

Vanne à siège droit 3/2 voies



Operating Instructions

Bedienungsanleitung

Manuel d'utilisation

We reserve the right to make technical changes without notice.
Technische Änderungen vorbehalten.
Sous réserve de modifications techniques.

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Operating Instructions 1601/00_EU-ML_00810459 / Original DE

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1 OPERATING INSTRUCTIONS

The operating instructions describe the entire life cycle of the device. Keep these instructions in a location which is easily accessible to every user and make these instructions available to every new owner of the device.

The operating instructions contain important safety information.

Failure to observe these instructions may result in hazardous situations.

- ▶ The operating instructions must be read and understood.

1.1 Symbols



Warns of an immediate danger.

- ▶ Failure to observe the warning may result in a fatal or serious injury.



Warns of a potentially dangerous situation.

- ▶ Failure to observe the warning may result in serious injuries or death.



CAUTION!

Warns of a possible danger.

- ▶ Failure to observe this warning may result in a moderately severe or minor injury.

NOTE!

Warns of damage to property.

- ▶ Failure to observe the warning may result in damage to the device or the equipment.



Designates additional significant information, tips and recommendations.



Refers to information in these operating instructions or in other documentation.

▶ designates instructions for risk prevention.

→ designates a procedure which you must carry out.

1.2 Definition of the term "Device"

In these instructions, the term "device" always refers to the globe valve type 2006.

2 AUTHORIZED USE

Non-authorized use of the globe valve type 2006 may be a hazard to people, nearby equipment and the environment.

- ▶ The device is designed for the controlled flow of liquid and gaseous media.
- ▶ In the potentially explosion-risk area the device may be used only according to the specification on the separate Ex type label. For use observe the additional information enclosed with the device together with safety instructions for the explosion-risk area.
- ▶ Devices without a separate Ex type label may not be used in a potentially explosive area.
- ▶ The admissible data, the operating conditions and conditions of use specified in the contract documents, operating instructions and on the type label are to be observed during use. The designated application cases are specified in the chapter entitled "[5 Product description](#)".
- ▶ The device may be used only in conjunction with third-party devices and components recommended and authorized by Bürkert.
- ▶ Correct transportation, correct storage and installation and careful use and maintenance are essential for reliable and problem-free operation.
- ▶ Use the device only as intended.

3 BASIC SAFETY INSTRUCTIONS

These safety instructions do not make allowance for any

- contingencies and events which may arise during the installation, operation and maintenance of the devices.
- local safety regulations; the operator is responsible for observing these regulations, also with reference to the installation personnel.



DANGER!

Danger – high pressure.

- ▶ Before loosening the lines and valves, turn off the pressure and vent the lines.

Risk of electric shock.

- ▶ Before reaching into the device or the equipment, switch off the power supply and secure to prevent reactivation.
- ▶ Observe applicable accident prevention and safety regulations for electrical equipment.

Risk of burns.

The surface of the device may become hot during long-term operation.

- ▶ Do not touch the device with bare hands.

General hazardous situations.

To prevent injury, ensure that:

- ▶ The system cannot be activated unintentionally.
- ▶ Do not use in areas which are prone to vibrations.
- ▶ Installation and repair work may be carried out by authorized technicians only and with the appropriate tools.
- ▶ After an interruption in the power supply or pneumatic supply, ensure that the process is restarted in a defined or controlled manner.
- ▶ The device may be operated only when in perfect condition and in consideration of the operating instructions.
- ▶ The general rules of technology apply to application planning and operation of the device.

To prevent damage to property of the device, ensure:

- ▶ Supply the media connections only with those media which are specified as flow media in the chapter entitled "[7 Technical Data](#)".
- ▶ Do not put any loads on the valve (e.g. by placing objects on it or standing on it).
- ▶ Do not make any external modifications to the valves. Do not paint the body parts or screws.



The globe valve type 2006 was developed with due consideration given to accepted safety rules and is state-of-the-art. However, dangers can still arise.

4 GENERAL INFORMATION

4.1 Contact addresses

Germany

Bürkert Fluid Control Systems
Sales Center
Christian-Bürkert-Str. 13-17
D-74653 Ingelfingen
Tel. + 49 (0) 7940 - 10 91 111
Fax + 49 (0) 7940 - 10 91 448
E-mail: info@de.buerkert.com

International

Contact addresses are found on the final pages of the printed operating manual.

You can also find information on the Internet under:

www.burkert.com

4.2 Warranty

The warranty is only valid if the device is used as authorized in accordance with the specified application conditions.

4.3 Information on the Internet

The operating instructions and data sheets for Type 2006 can be found on the Internet at: www.burkert.com

5 PRODUCT DESCRIPTION

5.1 General description

The externally controlled globe valve type 2006 is suitable for liquid and gaseous media.

It uses neutral gases or air (control media) to control the flow-rate of water, alcohol, oil, fuel, hydraulic fluid, saline solution, lye, organic solvent and steam (flow media).

5.2 Properties

- High tightness by self-adjusting packing glands (spindle sealing element).
- High seat tightness.
- High flow values by the streamlined valve body made of stainless steel.
- Actuator can be rotated steplessly through 360°.

5.2.1 Options

- Activation unit
Different versions of the activation units are available depending on the requirement.
- Stroke limitation
Limit of the maximum open position / flow rate by means of adjusting screw.

- Feedback indicator
The device features mechanical limit switches or inductive proximity switches.

5.2.2 Device versions

The globe valve is available for the actuator sizes \varnothing 50 mm to \varnothing 125 mm.

5.2.3 Restrictions



WARNING!

Risk of injury from water hammer.

A water hammer could crack the lines and device.

- ▶ Use valves with flow inlet above seat for gaseous media and steam only.

6 STRUCTURE AND FUNCTION

6.1 Structure

The globe valve consists of a pneumatically actuated piston actuator and a 3-way valve body. The actuator is manufactured from PA or PPS. The tried and tested, self-adjusting packing gland ensures high tightness. The flow-enhancing valve body made of stainless steel enables high flow values.

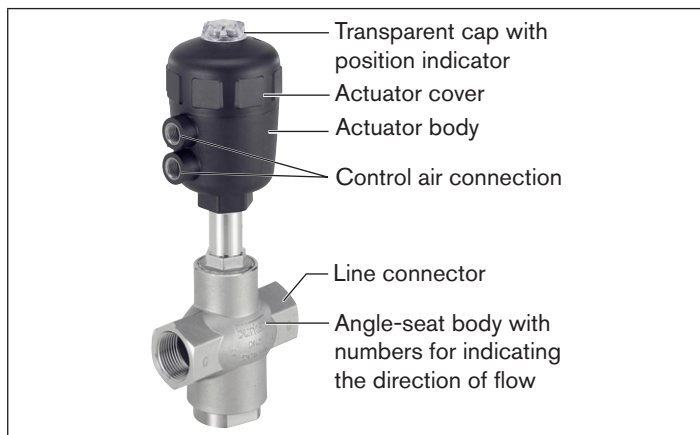


Fig. 1: Structure and description

6.2 Function

Depending on the version, the lower seat of the valve is closed with or against the medium flow.

Spring force (CFA) or pneumatic control pressure (CFB and CFI) generates the closing force on the closing body. The force is transferred via a spindle which is connected to the actuator piston.



WARNING!

For control function I – Danger if control pressure fails.

For control function I control and resetting occur pneumatically. If the pressure fails, no defined position is reached.

- ▶ To ensure a controlled restart, first pressurize the device with control pressure, then switch on the medium.

6.2.2 Control function and flow modes of operation



Different operating principles can be obtained with the same control function by swapping the pressure and working connections.

Control function A (CFA)

In rest position line connector 1 closed by spring force.

	Flow modes of operation	Connection		
		1	2	3
	C	P	A	R
	D	R	A	P
	E	P1	A	P2
F	A	P	B	
<p>A, B: Working connections P, P1, P2: Pressure connections R: Pressure relief</p>				

Tab. 1: Control function A (CFA)

Flow modes of operation

C		In rest position pressure connection 1 closed, working connection 2 relieved.
D		In rest position pressure connection 3 connected to working connection 2, relief 1 closed.
E		Mixing valve In rest position pressure connection 3 connected to working connection 2, pressure connection 1 closed.
F		Distribution valve In rest position pressure connection 2 connected to working connection 3, working connection 1 closed.

Tab. 2: Flow modes of operation

7 TECHNICAL DATA

7.1 Conformity

The globe valve type 2006 conforms with the EC Directives according to the EC Declaration of Conformity.

7.2 Standards

The applied standards, which verify conformity with the EC Directives, can be found on the EC-Type Examination Certificate and / or the EC Declaration of Conformity.

7.3 Type label

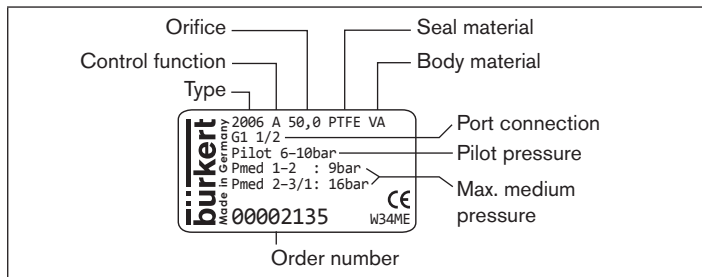


Fig. 2: Example of the type label

7.4 Operating conditions

7.4.1 Temperature ranges

Actuator size [mm]	Actuator material	Temperature ranges	
		Medium (for PTFE seal)	Environment ¹⁾
50, 63	PA	-10... see "Fig. 3"	-10... see "Fig. 3"
80...125	PA	-10...+180 °C	-10...+60 °C
50...80	PPS	-10...+180 °C	+5...+140 °C
125	PPS	-10...+180 °C	+5...+90 °C ²⁾

Tab. 3: Temperature ranges



¹⁾ If a pilot valve is used, the max. ambient temperature is +55 °C

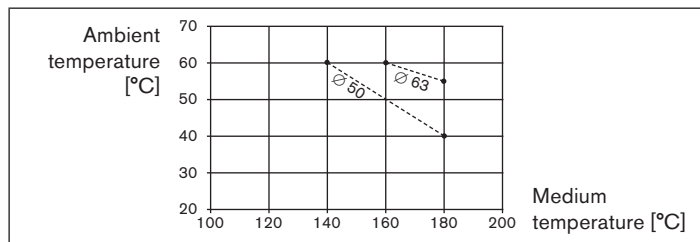


Fig. 3: Temperature range of the maximum medium and ambient temperature for PA actuators

²⁾ briefly up to max. 140 °C

7.4.2 Pressure ranges

Maximum control pressure:

Actuator material	Actuator size [mm]	Max. control pressure [bar]
PA	50..80	10
	125	7
PPS	50..80	10
	125	7

Tab. 4: Maximum control pressure

Maximum operating pressure, control function A:

Orifice [mm]	Actuator size [mm]	Max. medium pressure up to 180 °C [bar] direction of flow	
		1 → 2	2 → 3, 2 → 1
15, 20	50	11	16
	63	16	16
25	63	10	16
32, 40	80	9	16
	125	14	16
50	125	10	16

Tab. 5: Max. operating pressure



For control function F the maximum permitted operating pressure is 16 bar.

7.4.3 Minimum control pressures

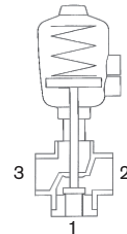
Minimum control pressure p_{min} , control function A:

Orifice [mm]	Actuator size [mm]	Min. control pressure p_{min} [bar]
15, 20	50	4,4
15, 20	63	4,7
25	63	4,9
32, 40	80	6,0
32, 40	125	3,4
50	125	4,3

Tab. 6: Minimum control pressure

Minimum control pressure p_{min} when direction of flow 3 → 2:

The required minimum control pressure p_{min} depends on the medium pressure.



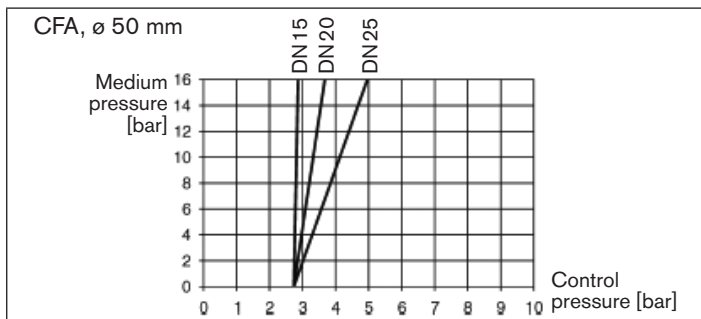


Fig. 4: Pressure graph, actuator \varnothing 50 mm, control function A

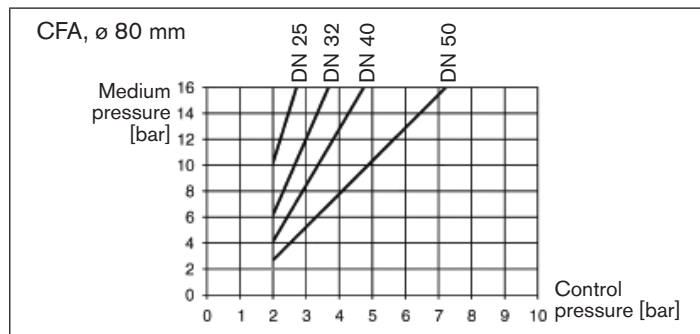


Fig. 6: Pressure graph, actuator \varnothing 80 mm, control function A

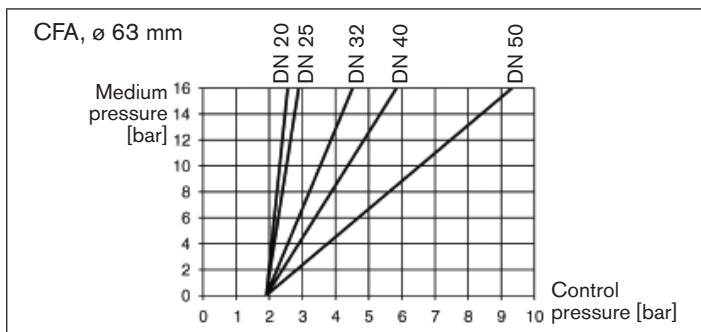


Fig. 5: Pressure graph, actuator \varnothing 63 mm, control function A

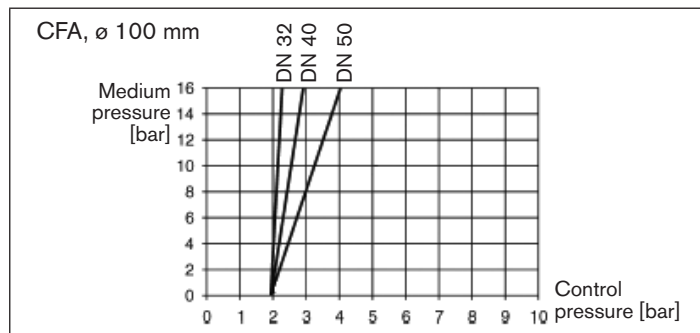


Fig. 7: Pressure graph, actuator \varnothing 100 mm, control function A

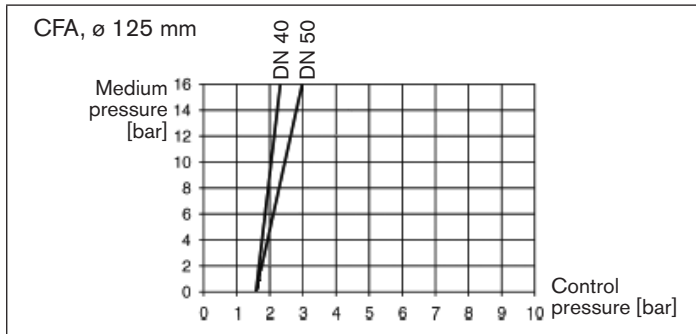


Fig. 8: Pressure graph, actuator ø 125, control function A

7.5 General technical data

Control functions (CF)

Control function A	Closed by spring force in rest position
Control function B	Opened by spring force in rest position
Control function I	Actuating function via reciprocal pressurization

Materials

Body	Stainless steel 316L
Actuator	PA, PPS
Seal	PTFE (other materials on request)
Packing gland (with silicone grease)	PTFE V rings with spring compensation

Media

Control media	Neutral gases, air
Flow media	Water, alcohols, oils, fuels, hydraulic liquid, saline solutions, lyes, organic solvents, steam

Connections

G 1/2 to G 2
 Other connections on request.

Installation position

Any position, preferably with actuator face up

8 ASSEMBLY

8.1 Safety instructions



DANGER!

Risk of injury from high pressure in the equipment.

- ▶ Before dismounting pneumatic lines or valves, turn off the pressure and vent the lines.



WARNING!

Risk of injury from improper assembly.

- ▶ Installation may be carried out by authorized technicians only and with the appropriate tools.

Risk of injury from unintentional activation of the system and an uncontrolled restart.

- ▶ Secure system from unintentional activation.
- ▶ Following assembly, ensure a controlled restart.

For control function I: Danger if control pressure fails.

For control function I control and resetting occur pneumatically. If the pressure fails, no defined position is reached.

- ▶ To ensure a controlled restart, first pressurize the device with control pressure, then switch on the medium.

8.2 Before installation

- Before connecting the valve, ensure the pipelines are flush.
- Any installation position is possible, preferably with actuator face up.
- Observe direction of flow (see type label).

8.2.1 Preparatory work

→ Clean pipelines (sealing material, swarf, etc).

For customer-specific requirement only: Remove actuator

Procedure:

→ Clamp valve body into a holding device.

NOTE!

Damage to the seat seal or the seat contour.

- ▶ When removing the actuator, ensure that the valve is in the open position.

→ Control function A and I:

Pressurize lower control air connection with compressed air (4 bar): Valve opens.

→ Place a suitable open-end wrench on the wrench flat of the nipple.

→ Unscrew the actuator off the valve body.

8.3 Installation



WARNING!

Risk of injury from improper installation.

Assembly with unsuitable tools or non-observance of the tightening torque is dangerous as the device may be damaged.

- ▶ For installation use an open-end wrench, never a pipe wrench.
- ▶ Observe the tightening torque (see "[Tab. 7: Tightening torques](#)").

Devices with approval in accordance with DIN EN 161

In accordance with DIN EN 161 "Automatic shut-off valves for gas burners and gas installations" a dirt trap must be connected upstream of the valve and prevent the insertion of a 1 mm plug gauge.

8.3.1 Installing the body

→ Connect body to pipeline.

8.3.2 Installing the actuator

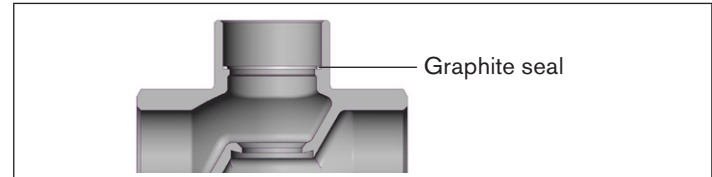


Fig. 9: Graphite seal

→ Check graphite seal and, if required, replace. Remove all residues when replacing seal.



WARNING!

Danger if incorrect lubricants used.

Unsuitable lubricant may contaminate the medium. In oxygen applications there is a risk of an explosion.

- ▶ In specific applications, e.g. oxygen or analysis applications, use appropriately authorized lubricants only.

→ Grease nipple thread before re-installing the actuator (e.g. with Klüber paste UH1 96-402 from Klüber).

NOTE!

Damage to the seal on the swivel plate.

- ▶ When installing the actuator, ensure that the valve is in the open position.

→ Control function A and I: Pressurize lower control air connection with compressed air (4 bar) so that the closing body is lifted off the valve seat and is not damaged when screwed in.

→ Screw actuator into the valve body.

Tightening torques:

Orifice (DN)	Tightening torque (Nm)
15	45 ± 3
20	50 ± 3
25	60 ± 3
32	65 ± 3
40	65 ± 3
50	70 ± 3

Tab. 7: Tightening torques



If the body is stainless steel, grease the nipple thread with e.g. Klüber paste UH1 96-402.

8.3.3 Rotating the drive

The position of the connections can be aligned steplessly by rotating the drive through 360°.

NOTE!

Damage to the seal on the swivel plate.

- ▶ When turning the actuator, ensure that the valve is in the open position.

→ Clamp the valve body into a holding device (applies only to valves not yet installed).

→ For control function A pressurize the lower control air connection with compressed air (4 bar): Valve opens.

→ Using a suitable open-end wrench, counter the wrench flat on the pipe.

→ Place a suitable open-end wrench on the hexagon of the actuator (see "Fig. 10").



WARNING!

Risk of injury from discharge of medium and pressure.

If the direction of rotation is wrong, the body interface may become detached.

- ▶ Turn the actuator **in the specified sense of direction** only (see "Fig. 10").

→ By turning the open-end wrench clockwise (viewed from above), move the actuator into the required position.

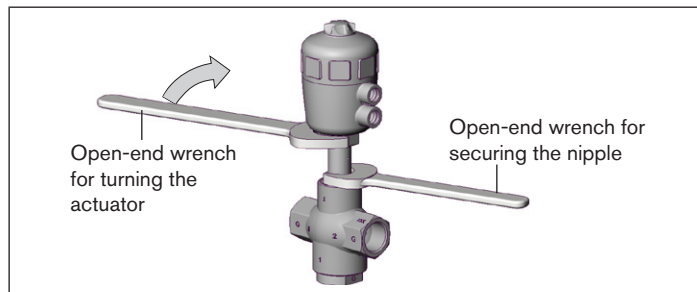


Fig. 10: Turning with open-end wrench

8.4 Pneumatic connection



DANGER!

Risk of injury from high pressure in the equipment.

- ▶ Before dismantling pneumatic lines or valves, turn off the pressure and vent the lines.



WARNING!

Risk of injury from unsuitable connection hoses.

Hoses which cannot withstand the pressure and temperature range may result in hazardous situations.

- ▶ Use only hoses which are authorized for the indicated pressure and temperature range.
- ▶ Observe the data sheet specifications from the hose manufacturers.

For control function I: Danger if control pressure fails.

For control function I control and resetting occur pneumatically. If the pressure fails, no defined position is reached.

- ▶ To ensure a controlled restart, first pressurize the device with control pressure, then switch on the medium.

8.4.1 Connection of the control medium



If the position of the control air connections is unfavorable for installation of the hoses, these can be steplessly aligned by turning the actuator through 360°.

The procedure is described in chapter "8.3.3 Rotating the drive".

Control function A:

On the lower connection of the actuator.

Control function B:

On the upper connection of the actuator.

Control function I:

On the upper and lower connections of the actuator.

Pressure on the lower connection opens the valve, pressure on the upper connection closes the valve.

Control function	Control air connection	
	Top	Bottom
A		●
B	●	
I	●	●
	closes lower valve seat	opens

Control air Connections

Top —

Bottom —





Fig. 11: Control air connection



If used in an aggressive environment, we recommend conveying all free pneumatic connections into a neutral atmosphere with the aid of a pneumatic hose.

Control air hose: Control air hoses of size 1/4" can be used.

9 START-UP

 Observe the type label specifications and information on pressure and temperature values in section [“7 Technical Data”](#).

9.1 Control pressure

 **WARNING!**

For control function I: Danger if control pressure fails.

If the pressure fails, no defined position is reached.

- ▶ For a controlled restart, initially pressurize the equipment with control pressure and then connect the medium.

→ Set the control pressure according to the type label specifications, see section [“7.3”](#) and flow direction (section [“9.2”](#) and [“9.3”](#)).

9.2 Incoming flow above upper seat (direction of flow 3 → 2)


Control function A (CFA) closes by spring force the lower valve seat with the medium flow. The medium pressure supports the closure and seal of the valve seat. The valve is opened by the control pressure.

 **WARNING!**

Risk of injury due to water hammer.

A closing shock can cause lines and the equipment to burst.

- ▶ Only use valves with the flow direction above the seat for gaseous media.

 To ensure complete opening of the upper valve seat, the minimum control pressure must be used.

9.3 Flow direction below the lower seat (direction of flow 1 → 2)

Control function A (CFA) closes by spring force against the medium flow. Control function B (CFB) closes with the control pressure against the medium flow. The medium pressure supports the opening of the valve.

 **WARNING!**

Seat leaks caused by the minimum control pressure being too low (on CFB and CFI) or the medium pressure being too high.

- ▶ Observe the minimum control pressure and medium pressure (see [„5.5.1. Pressure ranges“](#)).

10 DISASSEMBLY

 **DANGER!**

Risk of injury from discharge of medium and pressure.

It is dangerous to remove a device which is under pressure due to the sudden release of pressure or discharge of medium.

- ▶ Before removing a device, switch off the pressure and vent the lines.

→ Loosen pneumatic connection.

→ Remove device.

11 MAINTENANCE, TROUBLESHOOTING

11.1 Safety instructions



DANGER!

Risk of injury from high pressure in the equipment.

- ▶ Before dismantling pneumatic lines or valves, turn off the pressure and vent the lines.

Risk of injury from electric shock (only in conjunction with corresponding actuators).

- ▶ Before reaching into the device or the equipment, switch off the power supply and secure to prevent reactivation.
- ▶ Observe applicable accident prevention and safety regulations for electrical equipment.



WARNING!

Risk of injury from improper maintenance.

- ▶ Maintenance may be carried out by authorized technicians only and with the appropriate tools.

Risk of injury from unintentional activation of the system and an uncontrolled restart.

- ▶ Secure system from unintentional activation.
- ▶ Following maintenance, ensure a controlled restart.



WARNING!

For control function I: Danger if control pressure fails.

For control function I control and resetting occur pneumatically. If the pressure fails, no defined position is reached.

- ▶ To ensure a controlled restart, first pressurize the device with control pressure, then switch on the medium.

11.2 Maintenance work

Actuator:

The actuator is maintenance-free provided it is used according to these operating instructions.

Wearing parts of the angle seat valve / 3/2-way globe valve:

- Seals
- Closing body

→ If leaks occur, replace the particular wearing parts with an appropriate spare part (see Chapter "[12 Spare parts](#)").

11.2.1 Recommended maintenance intervals

The valve should be visually inspected once a year. Shorter maintenance intervals are recommended depending on application conditions. The visual inspection includes the pneumatic connections and the medium connections as well as the deaeration bore in the pipe.

11.2.2 Cleaning

Commercially available cleaning agents can be used to clean the outside.

NOTE!

Avoid causing damage with cleaning agents.

- ▶ Before cleaning, check that the cleaning agents are compatible with the body materials and seals.

11.3 Malfunctions

Malfunction	Remedial action
Actuator does not switch	Control air connection interchanged ³⁾ CFA: Connect lower control air connection CFB: Connect upper control air connection CFI: Lower control air connection: Open Upper control air connection: Close
	Control pressure too low → See pressure specifications on the type label
	Medium pressure too high → See pressure specifications on the type label
	Direction of flow interchanged → See direction of flow on the type label

Malfunction	Remedial action
Valve is not sealed	Dirt between seal and valve seat → Installing dirt trap
	Seat seal worn → Installing new seat seals
	Direction of flow interchanged → See direction of flow on the type label
	Medium pressure too high → See pressure specifications on the type label
Valve is leaking on the release bore	Control pressure too low → See pressure specifications on the type label
	Packing gland worn → Renew packing gland or replace actuator

Tab. 8: Malfunctions

³⁾ see "8.4 Pneumatic connection"

12 SPARE PARTS



CAUTION!

Risk of injury and/or damage by the use of incorrect parts.

Incorrect accessories and unsuitable spare parts may cause injuries and damage the device and the surrounding area.

- ▶ Use original accessories and original spare parts from Bürkert only.



We recommend having the spare parts replaced by specialist personnel from Bürkert.

- The following parts are available as spare parts for the straight valve Type 2006:
- **Seal set for actuator (SET 5)**
consisting of the sealing and wearing parts of the actuator.
- **Valve set (SET 6)**
consisting of the complete spindle with closing body.

Order numbers see [page 22](#).

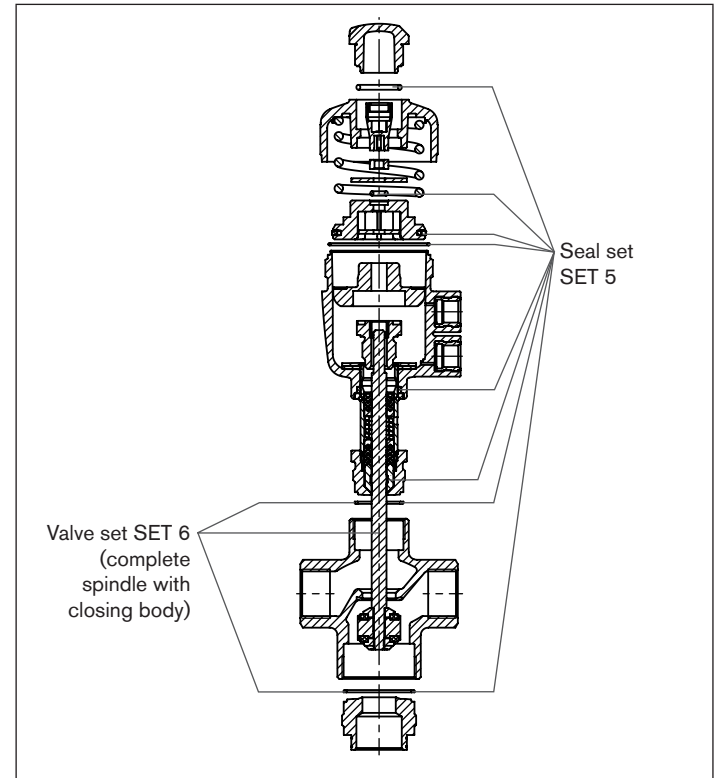


Fig. 12: Spare parts Type 2006

Order numbers seal set for actuator (SET 5)

Actuator size	Matching valve sizes	Order no. PA actuator	Order no. PPS actuator
D (ø 50 mm)	DN 15/20/25	233 588	233 582
E (ø 63 mm)	DN 25-50	233 591	233 583
F (ø 80 mm)	DN 25-65	233 593	233 584
G (ø 100 mm)	DN 32-65	233 594	233 585
H (ø 125 mm)	DN 40-65	233 596	233 586

Order numbers valve set (SET 6)

complete spindle with closing body

DN	Actuator size	Order no. (PTFE seal)
15	D (ø 50 mm)	288 384
15	E (ø 63 mm)	288 386
20	D (ø 50 mm)	288 384
20	E (ø 63 mm)	288 386
25	E (ø 63 mm)	288 392
32	F (ø 80 mm)	288 393
32	H (ø 125 mm)	288 394
40	E (ø 63 mm)	288 395
40	F (ø 80 mm)	288 393
40	H (ø 125 mm)	288 394
50	H (ø 125 mm)	288 399

13 PACKAGING, TRANSPORT, STORAGE

NOTE!

Transport damages.

Inadequately protected equipment may be damaged during transport.

- ▶ During transportation protect the device against wet and dirt in shock-resistant packaging.
- ▶ Avoid exceeding or dropping below the permitted storage temperature.

Incorrect storage may damage the device.

- ▶ Store the device in a dry and dust-free location.
- ▶ Storage temperature -20 ... +65 °C.

Damage to the environment caused by device components contaminated with media.

- ▶ Observe applicable regulations on disposal and the environment.
- ▶ Observe national waste disposal regulations.

www.burkert.com