bürkert
FLUID CONTROL SYSTEMS

Type 2301

2/2-way globe control valve
2/2-Wege-Geradsitzregelventil
Vanne de réglage à siège droit 2/2 voies



Quickstart

English Deutsch Français

MAN 1000311782 EN Version: DStatus: RL (released | freigegeben) printed: 01.11.2026

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Operating Instructions 2008/05_EU-ML_00810302 / Original DE

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1 QUICKSTART 3
2 SYMBOLS 4
3 INTENDED USE 4
4 BASIC SAFETY INSTRUCTIONS 5
5 GENERAL NOTES 6
6 STRUCTURE AND FUNCTION 7
7 TECHNICAL DATA 8
8 INSTALLATION 12
9 TRANSPORTATION, STORAGE, DISPOSAL 19

1 QUICKSTART

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

Important safety information!

Read the Quickstart carefully and fully. In particular, pay attention to section “Basic safety instructions” and “Intended use”.

▸ The Quickstart must be read and understood.

The Quickstart provides an exemplary description of the installation and start-up of the device.

The detailed description of the device can be found in the operating instructions for Type 2301.

The operating instructions can be found on the Internet at: www.burkert.com

1.1 Definition of terms/abbreviations

The term "device" used in these instructions always refers to the Type 2301 globe control valve.

The abbreviation "Ex" used in these instructions always stands for "explosion-proof".

In these instructions, the unit bar stands for relative pressure. The absolute pressure is stated separately in bar (abs).

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2 SYMBOLS

DANGER!

Warns of an immediate danger.

- Failure to observe these instructions will result in death or serious injuries.

WARNING!

Warns of a potentially hazardous situation.

- Failure to observe these instructions may result in serious injuries or death.

CAUTION!

Warns of a potential danger.

- Failure to observe these instructions may result in moderate or minor injuries.

NOTE!

Warns of damage.

Important tips and recommendations.

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

- Designates instructions to avoid a danger.

→ Highlights a procedure which you must carry out.

3 INTENDED USE

Unauthorised use of the Type 2301 globe control valve may be dangerous to people, nearby equipment and the environment.

- The device is designed to control the flow of liquid and gaseous media. It can only be operated in combination with a corresponding control unit.
- In potentially explosive environments, the Type 2301 globe control valve must only be used in accordance with the specifications on the separate Ex-type label. The additional information and safety instructions relating to Ex areas enclosed with the device must be adhered to when deploying the device.
- Devices without a separate Ex type label must not be used in the potentially explosive atmosphere.
- To use the device, observe the permitted data, operating conditions and application conditions. These specifications can be found in the contract documents, the operating instructions and on the type label.
- Prerequisites for safe and trouble-free operation are correct transport, correct storage and installation as well as careful operation and maintenance.
- Use the device only in conjunction with third-party devices and components recommended or approved by Bürkert.
- Use the device only as intended. Non-intended use of the device may be dangerous to people, nearby equipment and the environment.
- Protect device from harmful environmental influences (radiation, air humidity, fumes, etc.). For any matters requiring clarification, contact the relevant sales department.

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4 BASIC SAFETY INSTRUCTIONS

These safety instructions do not take account of any

- contingencies or events which may occur during installation, operation and maintenance of the devices;
- local safety regulations that are within the operator's scope of responsibility, including those relating to the installation personnel.

DANGER!

Risk of injury due to high pressure and escaping medium!

- Before working on the system or device, switch off the pressure and vent or empty the lines.

Risk of injury due to electric shock. (with installed electrical components)

- Before working on the device or system, switch off the power supply. Secure against reactivation.
- Observe the applicable accident prevention and safety regulations for electrical devices.

WARNING!

Risk of injury when opening the actuator!

The actuator contains a spring under tension. When the actuator is opened, the spring will jump out and may cause injuries.

- Do not open the actuator.

Risk of injury due to moving parts in the device!

- Do not reach into openings in the device.

Danger due to loud noises.

- Depending on the usage conditions, the device may generate loud noises. Detailed information on the probability of loud noises is available from the respective sales department.
- Wear hearing protection when in the vicinity of the device.

CAUTION!

Risk of burns or fire from hot device surfaces due to prolonged operation.

- Only touch the device when wearing protective gloves.
- Keep the device away from highly flammable substances and media.

Discharge of medium if packing gland exhibits wear

- Relief bore must be regularly inspected for any medium leakages.
- If the medium is hazardous, secure the area around the leakage to prevent risks.

General hazardous situations.

To prevent injuries, observe the following:

- Secure device or system to prevent unintentional activation.
- Only trained technicians may perform installation and maintenance work.
- Perform installation work and maintenance work using suitable tools only.

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- Following interruption of the process, ensure that the process is restarted in a controlled manner. Observe the sequence:
  1. Apply electrical or pneumatic supply.
  2. Charge with medium.
- Use the device only when it is in perfect condition and in accordance with the operating instructions.
- For applications planning and operation of the device, observe the plant-specific safety regulations.
- The plant owner is responsible for the safe operation and handling of the plant.
- Observe the general rules of technology.

Please observe the following in order to protect against damage to the device:

- Feed only those media listed in chapter “7 Technical data” into the medium ports.
- Do not place the valve under mechanical stress (e.g. by placing objects on it or standing on it).
- Do not make any external modifications to the valves. Do not paint housing parts or screws.
- The exhaust air can be contaminated by lubricants in the actuator.
- Transport, install and remove heavy device only with the aid of a second person and using suitable tools.

5 GENERAL NOTES

5.1 Contact addresses

Germany

Bürkert Fluid Control Systems
Sales Centre
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@burkert.com

International

You can also find the contact addresses online at:
www.burkert.com

5.2 Warranty

A precondition for the warranty is that the device is used as intended in consideration of the specified operating conditions.

5.3 Information on the Internet

Operating instructions and data sheets for Type 2301 can be found online at: www.country.burkert.com

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6 STRUCTURE AND FUNCTION

The Type 2301 globe control valve can only be used in combination with the following control units:
Positioner Type 8692, 8694, 8696 and 8792
Process controller Type 8693 and 8793

6.1 Structure

The valve seats are screwed in. Reduced seat sizes are simple to achieve by replacing the screw-in seats. The flow direction is always below the valve seat.

6.2 Function

The valve seat is always closed against the medium flow. Spring force (CFA) or pneumatic pilot pressure (CFB and CFI) generate the closing force on the control cone. A spindle connected to the actuator piston transmits the force.

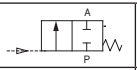
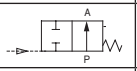
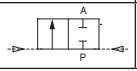
6.2.1 Control functions (CF)

WARNING!

For control function I – risk of pilot pressure failure!

With control function I, the control unit and reset are pneumatic. No defined position is reached during a pressure failure.

- To ensure a controlled restart of the device, first apply pilot pressure and then activate the medium.

A		Closed by spring force in rest position.
B		Opened by spring force in rest position.
I		Actuating function via reciprocal pressurisation

6.2.2 Flow direction below seat

Depending on the variant, the valve is closed against the medium flow either with spring force (CFA) or pilot pressure (CFB and CFI). Because the medium pressure is below the control cone, it helps open the valve.

WARNING!

Valve leak if there is too little minimum pilot pressure or high medium pressure!

Minimum pilot pressure for CFB and CFI that is too low, or failing to meet the permitted medium pressure, can cause a leak in the valve seat.

- Adhere to minimum pilot pressure.
- Do not exceed the medium pressure (see chapter “Pressure ranges”).

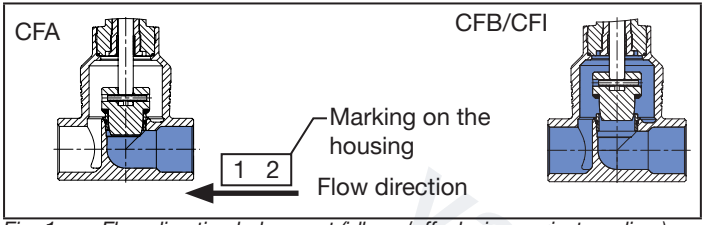


Fig. 1: Flow direction below seat (idle on/off, closing against medium)

7 TECHNICAL DATA

7.1 Conformity

The Type 2301 globe control valve conforms to the EU directives as per the EU Declaration of Conformity (if applicable).

7.2 Standards

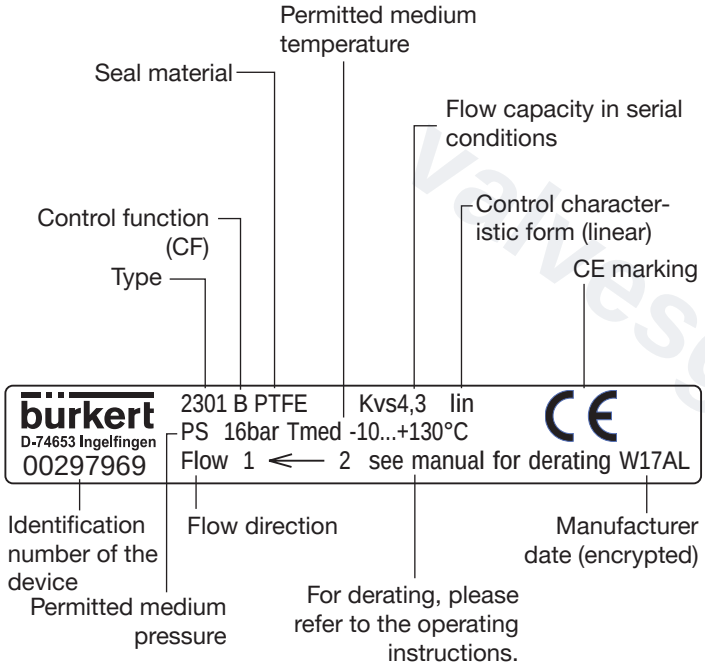
The applied standards, which are used to demonstrate conformity with EU Directives, are listed in the EU-type examination certificate and/or the EU Declaration of Conformity (if applicable).

According to Pressure Equipment Directive observe the following operating conditions:

Housing size DN	Maximum pressure for compressible fluids of Group 1 (dangerous gases and vapours according to Art. 3, No. 1.3, letter a, first dash)
DN65	15 bar
DN80	12.5 bar
DN100	10 bar

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7.3 Type label



7.4 Operating conditions

Note the permitted ranges on the device type label!

7.4.1 Actuator temperature ranges

Actuator size [mm]	Environment[1)]
ø 50, 70	–10 – +60 °C[2)]
ø 90, 130	–10 – +100 °C[3)]

Tab. 1: Actuator temperature ranges

1) When using a control unit, the max. Ambient temperature of this component must be noted and adhered to.

2) Pilot air connector as push-in connector

3) Control air connector as threaded bushing

The globe control valve is suitable for steam sterilisation.

7.4.2 Valve seat seal temperature range

Recommendation for the valve seat seal of leak class III and IV: Steel/steel.

Valve seat seal for leak class VI

For medium temperatures up to max. 130 °C:	PTFE
For medium temperature over 130 °C:	PEEK

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Derating pressure and temperature ranges

Usage limits of the valve (derating medium pressure)

Temperature	Medium pressure
–10 – +50 °C	25 bar
100 °C	24.5 bar
150 °C	22.4 bar
200 °C	20.3 bar
230 °C	19 bar

Tab. 2: Derating the medium pressure as per DIN EN 12516-1/PN25

Temperature	Medium pressure
–29 – +38 °C	19 bar
50 °C	18.4 bar
100 °C	16.2 bar
150 °C	14.8 bar
200 °C	13.7 bar
230 °C	12.7 bar

Tab. 3: Derating the medium pressure ASME B16.5/ASME B16.34 Cl.150

Temperature	Medium pressure
–10 – +50 °C	14 bar
100 °C	14 bar
150 °C	13.4 bar
200 °C	12.4 bar
230 °C	11.7 bar

Tab. 4: Derating the medium pressure as per JIS B 2220 10K

Usage limits of medium and ambient temperature

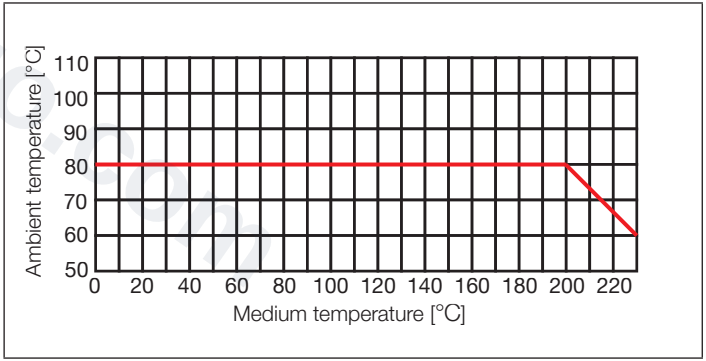


Fig. 2: Derating ELEMENT ANTG 50, 70, 90, 130

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7.4.3 Control medium

In conjunction with pneumatic control units (positioner or process controller), pilot air as per DIN ISO 8573-1 must be used:

- Class 3 (for water content)
- Class 5 (for dust and oil content).

The exact specification is described in the operating instructions for the respective positioner/process controller in the chapter "Technical data".

7.4.4 Pressure ranges

Max. Pilot pressure for valves without a pneumatic control unit

Actuator size [mm]	Max. permitted pilot pressure[4)]
ø 50, 70, 90	10 bar
ø 130	7 bar

Tab. 5: Pilot pressure without a pneumatic control unit

4) Observe the maximum pressure range on the type label!

Medium pressure for control function A[5)]

Actuator size [mm]	DN	Max. sealed medium pressure [bar]		
		Steel/steel	PTFE/steel	PEEK/steel
ø 50	10/15	16	16	10
	20	10	10	-
	25	5	5	-
ø 70	10/15	25	25	10
	20	16	16	10
	25	12	12	7
ø 90	20/25	25	25	10
	32	16	16	10
	40	12	12	7
	50	7	7	-
ø 130	32/40	25	25	10
	50	16	16	10
	65	16 (15 *)	16 (15 *)	10
	80	10	10	6
	100	6	6	-

** According to Pressure Equipment Directive for compressible fluids of Group 1 (dangerous gases and vapours according to Art. 3, No. 1.3, letter a, first dash)*

Tab. 6: Medium pressure for CFA

5) The control functions are in chapter"6.2.1 Control functions (CF)".

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Pilot pressure for control function B

The required minimum pilot pressure P_{min} for control function B and I (flow direction below seat) depends on the medium pressure.

The pressure graphs can be found in the operating instructions on the Internet at www.country.burkert.com

7.5 General technical data

Media

Control medium	Instrument air as per DIN ISO 8573-1
Flow media	Water, alcohols, oils, fuels, hydraulic fluids, saline solutions, lyes, organic solvents, vapour, air, neutral gases
Installation position	any, preferably actuator face up
Degree of protection	IP67 as per IEC 529/EN 60529
Control functions (CF)	Valve seat always closes against medium flow
Control function A	closed by spring force in rest position
Control function B	opened by spring force in rest position
Control function I	Settings function of the alternating pressurisation (not for actuator size ø 50 mm in combination with Type 8696)

8 INSTALLATION

8.1 Safety instructions

DANGER!

Risk of injury from high pressure in the system!

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

WARNING!

Risk of injury due to improper installation!

- Installation may be carried out by authorised technicians only and with the appropriate tools!

Risk of injury due to unintentional activation of the system and uncontrolled restart!

- Secure the system against unintentional activation.
- Following installation, ensure a controlled restart.

For control function I – risk of pilot pressure failure!

With control function I, the control unit and reset are pneumatic. No defined position is reached during a pressure failure.

- To ensure a controlled restart of the device, first apply pilot pressure and then activate the medium.

Risk of injury due to moving parts in the device!

- Do not reach into openings.

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CAUTION!

Risk of injury due to heavy device.

During transportation or installation work, a heavy device may fall down and cause injuries.

- ▸ Transport, install and remove heavy device with the aid of a second person only.
- ▸ Use suitable tools.

8.2 Before installation

- Any installation position of the globe control valve is possible, preferably with the actuator facing upward.
- Ensure that pipelines are aligned before connecting the valve.
- Note the flow direction (flow direction always below seat).

8.2.1 Preparatory work

→ Clear impurities from pipelines (sealants, metal chips, etc.).

Devices with welded connection

NOTE!

For valves with a mounted control unit:

When welding the valve body into the pipeline, the control unit must not be installed.

- ▸ Uninstall the control unit from the actuator as described below.

Uninstall the control unit from the actuator (if present):

→ Clamp valve body into a collet.

→ Loosen fastening screws (2 x).

→ Pull the control unit upward.

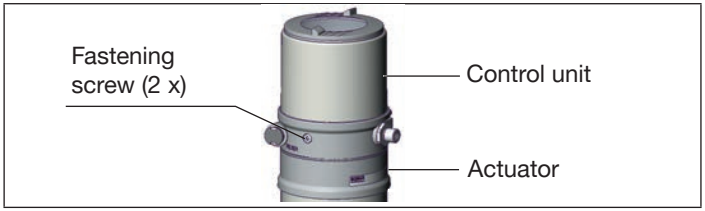


Fig. 3: Uninstall control unit

Remove the actuator from the valve body:

→ Install collet (white nozzle) in pilot air port 1.

NOTE!

Damage to the seat seal or seat contour!

- ▸ When removing the actuator, the valve must be in the open position.

→ For control function A pressurise the pilot air port 1 (see “Fig. 4”) with compressed air (5 bar): Valve opens.

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

→ Unscrew actuator from the valve body.

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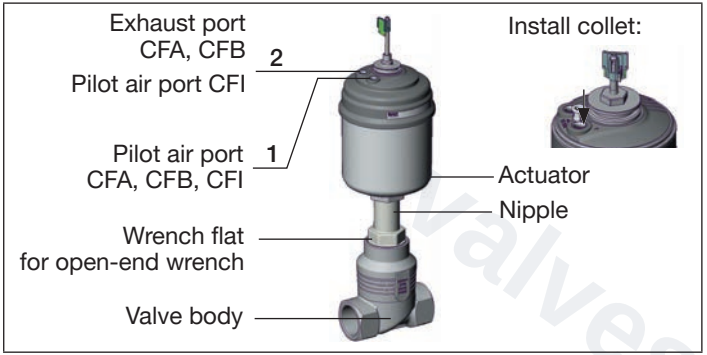


Fig. 4: Installation

Other device variants

→ Only uninstall the actuator if required by the customer.

→ For instructions see "Devices with welded connection".

8.3 Installation

WARNING!

Risk of injury due to improper installation!

Failure to observe the tightening torque value is dangerous due to the risk of damage to the device.

- Use an open-end wrench for installation, never a pipe wrench.
- Observe tightening torque (see "Tab. 7").

Dirt trap for devices with approval according to EN 161

According to EN 161 "Automatic shut-off valves for gas burners and gas appliances", a dirt trap, which prevents the penetration of a 1 mm test pin, must be installed upstream of the valve.

8.3.1 Installing the body

Welded connection

→ Weld or bond valve body in pipeline system.

Other body variants

→ Connect valve body to pipeline.

8.3.2 Installing the actuator (welded connection)

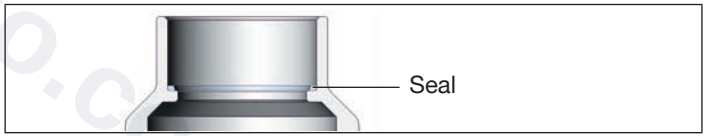


Fig. 5: Seal

→ Check seal and replace if required.

WARNING!

Risk due to incorrect lubricants!

Unsuitable lubricant may contaminate the medium. There is a risk of explosion in oxygen applications!

- For specific applications, e.g. oxygen or analysis applications, use approved lubricants only.

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→ Before re-installation, grease nipple thread of the actuator (e.g. using Klüberpaste UH1 96-402 from Klüber).

NOTE!

Damage to the valve seat seal or seat contour.

▸ When installing the actuator, the valve must be in the open position.

→ For control function A pressurise the pilot air port 1 (see “Fig. 4”) with compressed air (5 bar): Valve opens.

→ Screw actuator into the valve body. Observe tightening torque (see “Tab. 7”).

Tightening torques valve body/nipple

DN	Tightening torque [Nm]
10/15	45 ± 3
20	50 ± 3
25	60 ± 3
32/40	65 ± 3
50	70 ± 3
65	100 ± 3
80	120 ± 5
100	150 ± 5

Tab. 7: Tightening torques valve body/nipple

8.3.3 Install control unit

Before installation, check the state of the control unit connections and align the actuator if necessary. For a description see chapter “8.3.4 Turning actuator”.

→ Remove the collet from pilot air port 1.

→ Check the correct position of the O-rings in the pilot air ports.

→ Align the puck and control unit such that
1. the puck enters into the guide rail of the control unit and
2. the connection pieces of the control unit enter into the pilot air connections of the actuator (see “Fig. 6”).

NOTE!

Damage to the printed circuit board or functional failure!

▸ Make sure that the puck is lying flat on the guide rail.

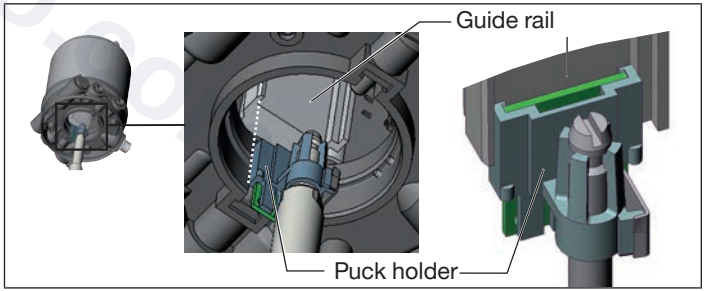


Fig. 6: Aligning the puck

• Push the control unit onto the actuator without rotating it until no gap is visible at the form seal.

NOTE!

Excessive torque when tightening the fastening screw cannot ensure the degree of protection IP65/IP67!

- The fastening screws must only be applied with a maximum torque of 1.5 Nm.

→ Attach the control unit to the actuator using the two lateral fastening screws. Only lightly tighten the screws (maximum torque: 1.5 Nm).

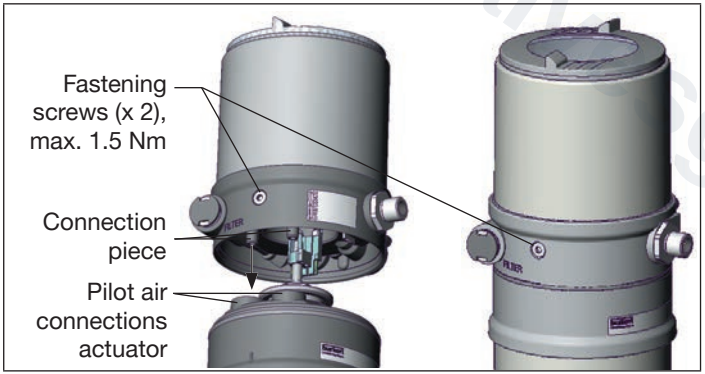


Fig. 7: Control unit installation

8.3.4 Turning actuator

The position of the ports can be smoothly aligned by turning the actuator 360°.

Only the actuator can be rotated. It is not possible to rotate the control unit against the actuator.

NOTE!

Damage to the valve seat seal or seat contour.

- When turning the actuator, the valve must be in the open position.

Procedure:

→ Clamp valve body in a collet (only for valves which have not yet been installed).

→ For **control function A**:
Without control unit: pressurise the pilot air port 1 with compressed air (5 bar): Valve opens.
With control unit: open the valve in accordance with the operating instructions of the control unit.

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

WARNING!

Risk of injury from discharge of pressure and escaping medium!

The body connection can loosen when rotated incorrectly.

- Only turn the actuator **in the specified direction** (see “Fig. 8”)!

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→ Place a suitable open-end wrench on the hexagon head of the actuator.

→ Move the actuator into the required position by turning it counterclockwise (seen from below).

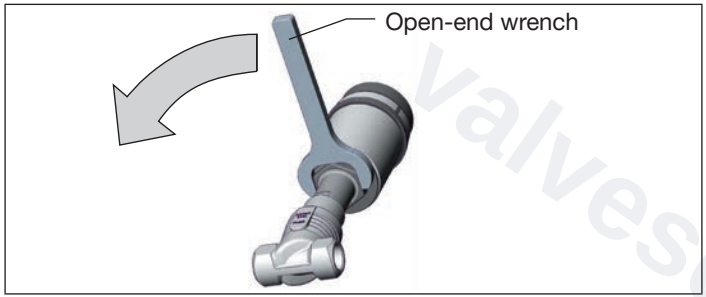


Fig. 8: Rotating with open-end wrench

8.4 Pneumatic connection

DANGER!

Risk of injury from high pressure in the system!

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

WARNING!

For control function I – risk of pilot pressure failure!

With control function I, the control unit and reset are pneumatic. No defined position is reached during a pressure failure.

- To ensure a controlled restart of the device, first apply pilot pressure and then activate the medium.

Risk of injury due to unsuitable connection hoses!

Hoses that cannot withstand the pressure and temperature range can cause hazardous situations.

- Only use hoses that are permitted for the specified pressure and temperature range.
- Note the data sheet information from the hose manufacturers.

The pneumatic connection of the globe control valve can only be performed in conjunction with the corresponding control unit.

Possible control units are:
Positioner Type 8692, 8694, 8696 and 8792
Process controller Type 8693 and 8793

8.4.1 Connecting the control medium

→ Connect the control medium to the pilot air port (“Fig. 9”: **1**) (3– 7 bar; instrument air, oil-, water- and dust-free).

→ Install the exhaust air line or a silencer onto the exhaust air port (“Fig. 9”: **3**) and – if available – to the additional exhaust air port (“Fig. 9”: **3.1**).

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For usage in an aggressive environment, we recommend using a pneumatic hose to drain all free pneumatic ports in a neutral atmosphere.

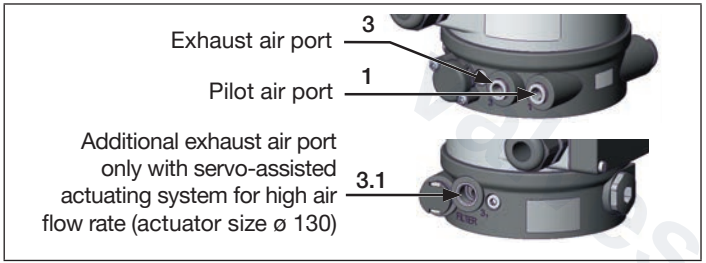


Fig. 9: Pneumatic connection

Pilot air hose:

Pilot air hoses of sizes 6/4 mm or ¼" can be used.
Optionally a pilot air port via G⅛" thread is possible.

8.5 Start-up

Perform the *X.TUNE* after installing the device. This function presets the control parameters.

See control unit operating instructions for a description.

8.6 Disassembly

DANGER!

Risk of injury from discharge of pressure and escaping medium!

Dismantling a device which is under pressure is hazardous due to a sudden discharge of pressure or escaping medium.

▸ Before disassembly, shut off the pressure and vent all lines.

Procedure:

→ Loosen pneumatic connection.

→ Disassemble the device.

8.7 Maintenance work

→ Perform a visual inspection of the device once per year. Shorter maintenance intervals are recommended depending on the usage conditions.

Wearing parts: Seals and swivel plate.

→ If leaks occur, replace the respective wearing part.

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Visual inspection:

According to the usage conditions, perform regular visual inspections:

→ Check medium ports for tightness.

→ Check relief bore on the pipe for leaks.

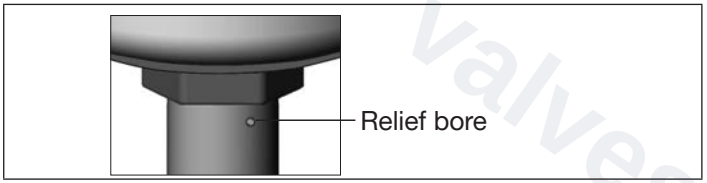


Fig. 10: Relief bore

The maintenance and repair instructions can be found online at: www.country.burkert.com

9 TRANSPORTATION, STORAGE, DISPOSAL

NOTE!

Damage from transport and storage!

- Protect the device against moisture and dirt in shock-resistant packaging during transportation and storage.
- Permitted storage temperature: –20 – +65 °C.

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

- Dispose of the device and packaging in an environmentally friendly manner!

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