

## Type 2300

2/2-way angle-seat control valve



Quickstart

English

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

© Bürkert Werke GmbH & Co. KG, 2013 - 2018

Operating Instructions 1802/03\_EU-EN\_00810317 / Original DE

1	QUICKSTART .....	3
2	SYMBOLS .....	4
3	INTENDED USE .....	4
4	BASIC SAFETY INSTRUCTIONS.....	5
5	GENERAL INFORMATION .....	6
6	STRUCTURE AND FUNCTION .....	7
7	TECHNICAL DATA.....	8
8	INSTALLATION .....	10
9	PACKAGING, TRANSPORT, STORAGE .....	17

## 1 QUICKSTART

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.

### Important Safety Information!

Read Quickstart carefully and thoroughly. Study in particular the chapters entitled [“Basic Safety Instructions”](#) and [“Intended use”](#).

- ▶ Quickstart must be read and understood.

Quickstart explains, for example, how to install and start-up the device.

A detailed description of the device can be found in the operating instructions for Type 2300.



The operating instructions can be found on the Internet at: [www.burkert.com](http://www.burkert.com)

### 1.1 Definition of term / abbreviation

In these instructions, the term “device” always refers to the angle-seat control valve type 2300.

The abbreviation “Ex” used in these instructions always stands for “explosion-protected”.

## 2 SYMBOLS



### DANGER!

Warns of an immediate danger!

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



### WARNING!

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 material damage!



Important 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.

## 3 INTENDED USE

Non-authorized use of the globe valve Type 2106 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 globe valve type 2106 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. These are described in the chapter entitled "[7 Technical data](#)".
- ▶ Protect device from damaging environmental influences (e.g. radiation, humidity, steam, etc.). If anything is unclear, consult the relevant sales office.
- ▶ 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 faultless operation.

## 4 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!

#### Risk of injury from high pressure in the equipment or device!

- ▶ Before working on equipment or device, switch off the pressure and deaerate or drain lines.

#### Risk of injury from electric shock (when electrical component installed).

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



### WARNING!

#### Risk of injury when opening the actuator!

The actuator contains a tensioned spring. If the actuator is opened, there is a risk of injury from the spring jumping out!

- ▶ The actuator must not be opened.

#### Risk of injury from moving parts in the device!

- ▶ Do not reach into openings.

#### Danger due to loud noises.

- ▶ Depending on the operating conditions, the device may generate loud noises. More detailed information on the likelihood of loud noises is available from the relevant sales office.
- ▶ Wear hearing protection when in the vicinity of the device.



### CAUTION!

#### Risk of burns!

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

- ▶ Do not touch the device with bare hands.

#### Leaking medium when the packing gland is worn.

- ▶ Regularly check relief bore for leaking medium.
- ▶ If the media is hazardous, protect the area surrounding the discharge point against dangers.

#### General hazardous situations.

##### To prevent injury, ensure:

- ▶ That the system cannot be activated unintentionally.
- ▶ 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.
- ▶ Observe the safety regulations specific to the plant for application planning and operation of the device.

- ▶ The plant operator is responsible for the safe operation and handling of the plant.
- ▶ 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 exhaust air may be contaminated with lubricants in the actuator.
- ▶ Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.

## 5 GENERAL INFORMATION

### 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](mailto:info@burkert.com)

#### International

Contact addresses are found on the Internet under:  
[www.burkert.com](http://www.burkert.com)

### 5.2 Warranty

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

### 5.3 Information on the internet

The operating instructions and data sheets for Type 2300 can be found on the Internet at: [www.burkert.com](http://www.burkert.com)

## 6 STRUCTURE AND FUNCTION



The angle-seat control valve Type 2300 can be operated only 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 incorporated directly. Via a dowel pin, the control cone is modularly coupled to the actuator spindle for quick changeovers. The flow direction is always below seat.

### 6.2 Function

The seat of the valve is always closed against the medium flow. Spring force (CFA) or pneumatic pilot pressure (CFB and CFI) generates the closing force on the control cone. The force is transferred via a spindle which is connected to the actuator piston.

#### 6.2.1 Control functions (CF)

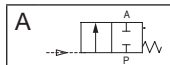


#### WARNING!

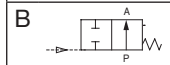
##### For control function I – Danger if pilot pressure fails!

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

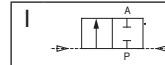
- ▶ To ensure a controlled restart, first pressurize the device with pilot pressure, then switch on the medium.



Normally closed by spring action



Normally open by spring action



Actuating function via reciprocal pressurization

#### 6.2.2 Flow direction below the seat

Depending on the version, the valve is closed against the medium flow with spring force (control function A, CFA) or with pilot pressure (control function B or I, CFB or CFI). As the medium pressure is under the control cone, this pressure contributes to the opening of the valve.



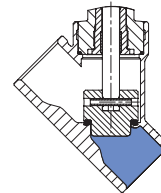
#### WARNING!

**Medium may be discharged if minimum pilot pressure is too low or medium pressure too high!**

If the minimum pilot pressure is too low for CFB and CFI or the permitted medium pressure is exceeded, leaks may occur.

- ▶ Observe minimum pilot pressure.
- ▶ Do not exceed medium pressure (see chapter “[Pressure ranges](#)”).

Rest position  
CFA



Rest position  
CFB / CFI

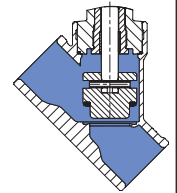


Fig. 1: Flow direction below the seat  
(Rest open/closed, closing against medium)

## 7 TECHNICAL DATA

### 7.1 Conformity

Type 2300 conforms with the EU Directives according to the EU Declaration of Conformity.

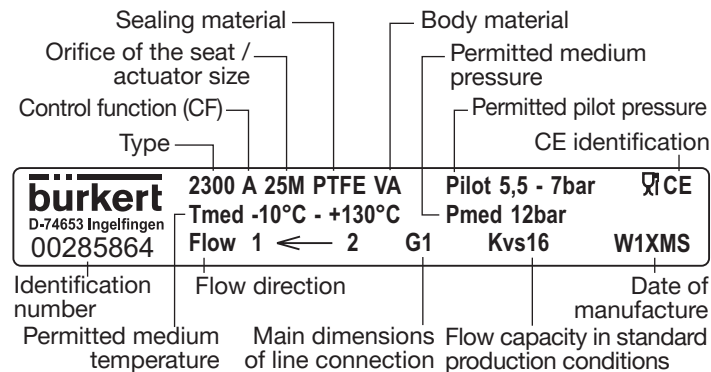
### 7.2 Standards

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

According to Pressure Equipment Directive the following operating conditions must be observed:

Line connection orifice	Maximum pressure for compressible fluids of Group 1 (hazardous gases and vapors according to Art. 3 No. 1.3 Letter a first dash)
DN65	15 bar

### 7.3 Type label





## 7.4 Operating conditions



Observe permitted ranges on the type label of the device!

### 7.4.1 Temperature ranges

Actuator size [mm]	Actuator material	Medium		Environment <sup>1)</sup>
		Seat seal steel - steel	Seat seal PTFE - steel	
ø 50	PPS	-10 ... +185 °C	-10 ... +130 °C	-10 ... +60 °C <sup>2)</sup>
ø 70				
ø 90				
ø 130				-10 ... +100 °C <sup>3)</sup>

Tab. 1: Temperature ranges



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



The angle-seat control valve is suitable for steam sterilization.

2) Pilot air ports with push-in connector

3) Pilot air ports with threaded bushing

### 7.4.2 Control medium

In conjunction with pneumatic control units (positioner and process controllers), pilot air according to DIN ISO 8573-1 must be used:

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



The specification is described in detail in the operating instructions of the respective positioner / process controller in the chapter entitled “Technical data”.

### 7.4.3 Pressure ranges

Maximum pilot pressure for valves without pneumatic control units

Actuator size [mm]	Actuator material	Max. permitted pilot pressure <sup>4)</sup>
ø 50, 70, 90	PPS	10 bar
ø 130		7 bar

Tab. 2: Pilot pressure for valves without pneumatic control units



4) <sup>4)</sup> Observe the maximum pressure range according to the type label!

Minimum control pressure  $P_{\min}$  for control function A

Actuator size [mm]	50/70/90	130 (Connection size DN40 and DN50)	130 (Connection size DN65)
$P_{\min}$ [bar]	5.5	5.5	5.6

Tab. 3: Minimum control pressure for CFA

Pilot pressure for control function B

Actuator size	Connection size [mm]	Pilot pressure [bar] for medium pressure		Max. permitted medium pressure [bar]
		0 bar	max	
ø 50 mm	15	4.6	6.6	16
	20	5.1	7.0	9
	25	5.1	7.0	5
ø 70 mm	15	4.4	5.3	16
	20	5.2	6.8	16
	25	5.2	7.0	12
	32	5.2	7.0	6
ø 90 mm	25	2.4	4.2	16
	32	2.4	5.3	16
	40	2.5	6.5	16
	50	2.5	7.0	14
ø 130 mm	40	2.7	4.5	16
	50	2.7	5.6	16
	65	2.7	7.0	16 (15*)

Tab. 4: Pilot pressure for control function B

\* According to Pressure Equipment Directive for compressible fluids of Group 1 (hazardous gases and vapors according to Art. 3 No. 1.3 Letter a first dash)

The required minimum pilot pressure  $P_{min}$  with control function B and I (flow below the seat) is dependent on the pressure of the medium.



The pressure diagrams are in the operating instructions on the Internet: [www.burkert.com](http://www.burkert.com)

## 7.5 General technical data

### Media

Control medium neutral gases, air  
Flow media Water, Alcohol, Fuel, Hydraulic liquids, Saline solutions, Lyes, Organic solvents

Installation position as required, preferably with actuator in upright position

Protection class IP67 in accordance with IEC 529/EN 60529

Control functions (CF) The valve seat is always closed against the medium flow

Control function A Normally closed by spring action

Control function B Normally open by spring action

Control function I Actuating function via reciprocal pressurization (not for actuator size ø 50 mm in combination with Type 8696)

## 8 INSTALLATION

### 8.1 Safety instructions



#### DANGER!

**Danger – high pressure in the equipment!**

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



### WARNING!

#### Risk of injury from improper installation!

- ▶ Installation may be carried out by authorised 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 pilot 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 pilot pressure, then switch on the medium.

#### Risk of injury from moving parts in the device!

- ▶ Do not reach into openings.



### CAUTION!

#### Risk of injury due heavy devices!

- ▶ During transport or during assembly, a heavy device may fall and cause injury.
- ▶ Do not transport, install or remove heavy devices without the aid of a second person and using suitable auxiliary equipment.
- ▶ Use appropriate tools.

## 8.2 Before installation

- The globe control valve can be installed in any installation position, preferably with the actuator in upright position.
- Before connecting the valve, ensure the pipelines are flush.
- Make certain the flow direction is correct (flow direction always below the seat).

### 8.2.1 Preparatory work

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

#### Devices with welded body

### NOTE!

#### For valves with installed control:

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

- ▶ Remove control from the actuator described below.

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

- Clamp the valve body in a holding device.
- Loosen the fastening screws (2x).
- Remove the control unit upwards.

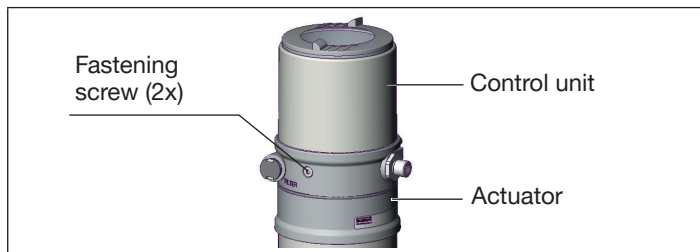


Fig. 2: Disassembly the control unit

Remove the actuator from the valve body.

- Install collet (white grommet) in pilot air port 1.

**NOTE!**

**Damage to the seat seal or the seat contour!**

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

- Control function A pressurize the pilot air port 1 (see “Fig. 3”) with compressed air (5 bar): valve opens.
- Using a suitable open-end wrench, place the wrench flat on the pipe.
- Unscrew the actuator from the valve body.

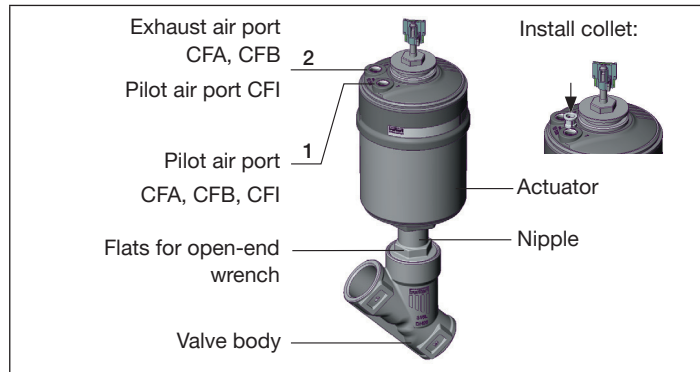


Fig. 3: Installation

**Other device versions**

- Do not remove actuator unless this is a customer-specific requirement.
- Procedure see “[Devices with welded 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. 5”).

#### Dirt trap for devices with authorisation in acc. with DIN EN 161

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

### 8.3.1 Installation of the valve body

#### Welded bodies

→ Weld valve body in pipeline system.

#### Other body versions

→ Connect body to pipeline.

### 8.3.2 Install actuator (welded body)

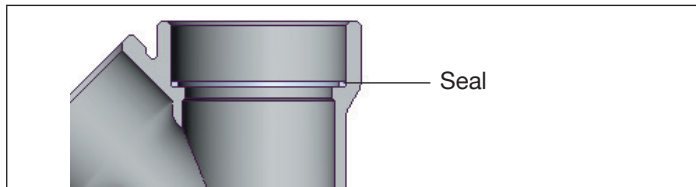


Fig. 4: Seal

→ Check the seal and if required, replace it.



### 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 seat seal or the seat contour!

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

→ Control function A pressurize the pilot air port 1 (see “Fig. 3”) with compressed air (5 bar): valve opens.

→ Screw actuator into the valve body. Observe tightening torque (see “Tab. 5”).

#### Tightening torques of valve body / nipples

DN	Tightening torques [Nm]
15	45 ±3
20	50 ±3
25	60 ±3
32/40	65 ±3
50	70 ±3
65	100 ±3

Tab. 5: Tightening torques of valve body / nipples

### 8.3.3 Install control unit



Before installation, check the position of the ports on the control unit and, if required, align the actuator.

Description see chapter “8.3.4 Rotating the actuator”.

- Remove collet from pilot air port 1.
- Check that the O-rings are correctly positioned in the pilot air ports.
- Align the puck holder and the control unit until
  1. the puck holder can be inserted into the guide rail of the control unit and
  2. the supports of the control unit can be inserted into the pilot air ports of the actuator (see “Fig. 5”).

#### NOTE!

**Damaged printed circuit board or malfunction!**

- ▶ Ensure that the puck holder is situated flat on the guide rail.

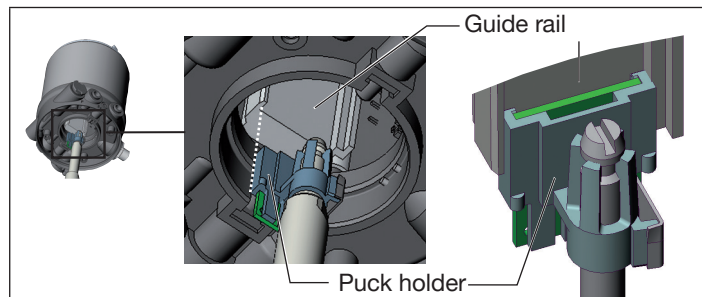


Fig. 5: Aligning the puck holder

- Push the control unit, without turning it, onto the actuator until no gap is visible on the form seal.

#### NOTE!

**Too high torque when screwing in the fastening screw does not ensure protection class IP65 / IP67!**

- ▶ The fastening screws may be tightened to a maximum torque of 1.5 Nm only.

- Attach the control unit to the actuator using the two side fastening screws. In doing so, tighten the screws only hand-tight (max. torque: 1.5 Nm).

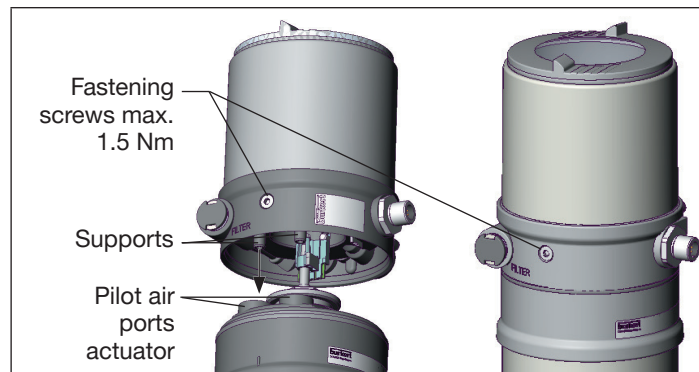


Fig. 6: Install control unit

### 8.3.4 Rotating the actuator

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

**!** Only the entire actuator can be rotated. The control unit cannot be rotated contrary to the actuator.

#### NOTE!

##### Damage to the seat seal or the seat contour!

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

#### Procedure:

- Clamp the valve body in a holding device (applies only to valves which have not yet been installed).
- **Control function A:**  
**Without unit control:** pressurize the pilot air port 1 with compressed air (5 bar): valve opens.  
**With unit control:** open the valve according to the operating instructions for the control unit.
- Counter on the flats of the nipple with a suitable open-end wrench.

#### **!** WARNING!

##### Risk of injury from discharge of medium and pressure!

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

- ▶ Rotate the actuator module in the specified direction only (“Fig. Z”)!

- Place suitable open-end wrench on the hexagon of the actuator.
- Rotate counter-clockwise (as seen from below) to bring the actuator into the required position.

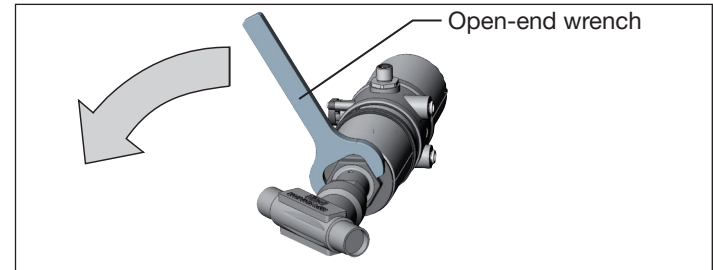


Fig. 7: Rotating with open-end wrench

### 8.4 Pneumatic connection



#### DANGER!

##### Danger – high pressure in the equipment!

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



#### WARNING!

##### For control function I – Danger if pilot 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 pilot pressure, then switch on the medium.

### 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.



The pneumatic connection of the angle-seat control valve can be carried out only in connection with the appropriate control unit.

Possible control units are:

Positioner Type 8692, 8694, 8696 and 8792;  
Process controller Type 8693 and 8793.

### 8.4.1 Connection of the control medium

- Connect the control medium to the pilot air port (“Fig. 8”: 1) (3 – 7 bar; instrument air, free of oil, water and dust).
- Fit the exhaust line or a silencer to the exhaust air port (“Fig. 8”: 3) and, if available, to the additional exhaust air port (“Fig. 8”: 3.1).



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

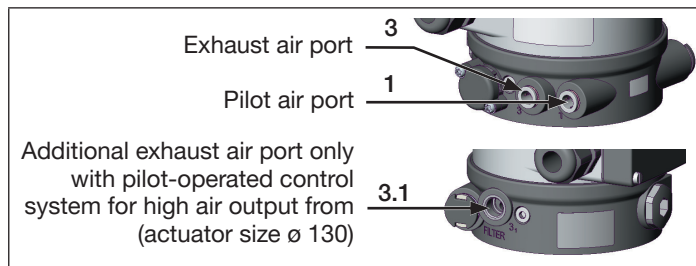


Fig. 8: Pneumatic connection

### Control air hose:

6/4 mm or 1/4” pilot air hoses can be used.

A pilot air port via G 1/8” thread is available as an option.

## 8.5 Start-up

After installing the device, run the *X.TUNE* function. This function presets the control parameters.



Description – see operating instructions for the control.

## 8.6 Removal



### WARNING!

#### 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.



**Procedure:**

- Loosen the pneumatic connection.
- Remove the device.

## 8.7 Maintenance work

- Complete a visual inspection of the equipment once a year. Shorter maintenance intervals may be recommended depending on the operating conditions.

**Wear parts:** seals and control cone.

- In the event of a leak, replace the relevant wear part.



The maintenance and repair instructions are available on the Internet: [www.burkert.com](http://www.burkert.com)

**Visual inspection:**

Perform regular visual inspections according to the application conditions:

- Check media connections for leaks.
- Check release bore on the tube for leaks.



Fig. 9: Release bore

## 9 PACKAGING, TRANSPORT, STORAGE

**NOTE!**

**Transport and storage damage!**

- 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 components contaminated with media.**

- Ensure the device and packaging are disposed of in an environmentally sound manner!



[www.burkert.com](http://www.burkert.com)