

## Type 2101

2/2 way globe valve

2/2-Wege-Geradsitzventil

Vanne à siège droit 2/2 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.

© Bürkert Werke GmbH & Co. KG, 2008 - 2021

Operating Instructions 2112/13\_EU-ML\_00806076 / Original DE

<b>1</b>	<b>OPERATING INSTRUCTIONS</b> .....	<b>4</b>	<b>8.3</b>	<b>Installation</b> .....	<b>19</b>
1.1	Symbols.....	4	8.4	Pneumatic connection.....	22
1.2	Definition of terms/abbreviations .....	4	8.5	Start-up .....	23
<b>2</b>	<b>INTENDED USE</b> .....	<b>5</b>	8.6	Disassembly .....	23
<b>3</b>	<b>BASIC SAFETY INSTRUCTIONS</b> .....	<b>5</b>	<b>9</b>	<b>ELECTRICAL CONTROL UNIT</b> .....	<b>23</b>
<b>4</b>	<b>GENERAL NOTES</b> .....	<b>7</b>	<b>10</b>	<b>MAINTENANCE, CLEANING</b> .....	<b>24</b>
4.1	Contact addresses .....	7	10.1	Safety instructions.....	24
4.2	Warranty .....	7	10.2	Maintenance work .....	24
4.3	Information on the Internet.....	7	10.3	Replacing wearing parts.....	25
<b>5</b>	<b>PRODUCT DESCRIPTION</b> .....	<b>7</b>	<b>11</b>	<b>FAULTS</b> .....	<b>35</b>
5.1	General description .....	7	<b>12</b>	<b>SPARE PARTS</b> .....	<b>36</b>
5.2	Properties .....	7	12.1	Replacement part set .....	36
5.3	Intended area of application.....	8	12.2	Installation tools .....	38
<b>6</b>	<b>STRUCTURE AND FUNCTION</b> .....	<b>8</b>	<b>13</b>	<b>TRANSPORT, STORAGE, PACKAGING</b> .....	<b>39</b>
6.1	Structure.....	8			
6.2	Function.....	9			
<b>7</b>	<b>TECHNICAL DATA</b> .....	<b>11</b>			
7.1	Conformity.....	11			
7.2	Standards.....	11			
7.3	Type label .....	11			
7.4	Operating conditions.....	12			
7.5	General technical data.....	16			
<b>8</b>	<b>INSTALLATION</b> .....	<b>17</b>			
8.1	Safety instructions.....	17			
8.2	Before installation.....	18			

## 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 them available to every new owner of the device.

### **WARNING!**

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

#### **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!

- ▶ Failure to observe these instructions may result in damage to the device or the system.



Indicates important additional information, 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.

### 1.2 Definition of terms/abbreviations

The term "device" used in these instructions always refers to the Type 2101 globe valve.

In these instructions, the unit bar stands for relative pressure.

The absolute pressure is stated separately in bar(abs).

## 2 INTENDED USE

Unauthorised use of the Type 2101 globe valve may be dangerous to people, nearby equipment and the environment.

- ▶ The device is designed to control the flow of liquid and gaseous media.
- ▶ In the potentially explosive atmosphere, only use devices that are approved for this purpose. These devices are identified by a separate Ex type label. Before use, note the information on the separate Ex type label and the Ex additional instructions or the separate Ex operating Instructions.
- ▶ 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.
- ▶ Protect device from harmful environmental influences (e.g. radiation, air humidity, fumes). For any matters requiring clarification, contact the relevant sales department.
- ▶ Use the device only in conjunction with third-party devices and components recommended or approved by Bürkert.
- ▶ Prerequisites for safe and trouble-free operation are correct transport, correct storage and installation as well as careful operation and maintenance.
- ▶ The exhaust air can be contaminated by lubricants in the actuator.
- ▶ Only use the device as intended.

## 3 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 in the system or device.**

- ▶ Before working on the system or device, switch off the pressure and ventilate 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 worn**

- ▶ Relief bore must be regularly inspected for any medium leakages.
- ▶ If medium is leaking from the relief bore, the packing gland must be replaced (see chapter "Maintenance").
- ▶ If the medium is hazardous, secure the area around the leakage to prevent risks.

**Risk of injury due to bursting lines and device.**

- ▶ Because of the risk of pressure surge, **valves with the flow direction above the seat must not be used for fluid media.**
- ▶ Observe the type of flow and type of medium for operating the device.

**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.
- ▶ 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 make any changes to the device and do not subject it to mechanical stress.
- ▶ Transport, install and dismantle heavy device only with the aid of a second person and using suitable tools.

## 4 GENERAL NOTES

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

#### International

The contact addresses can be found on the back pages of the printed operating instructions.

They are also available online at: [country.burkert.com](http://country.burkert.com)

### 4.2 Warranty

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

### 4.3 Information on the Internet

Operating instructions and data sheets for Type 2101 can be found online at: [country.burkert.com](http://country.burkert.com)

## 5 PRODUCT DESCRIPTION

### 5.1 General description

The 2/2-way globe valve Type 2101 is suitable for liquid and gaseous media. Using neutral gases or air (control media), it controls the flow of water, alcohol, oil, fuel, hydraulic fluid, saline solution, lye, organic solvents and vapour (flow media).

One special characteristic of the globe valves is the screwed-in seats, which can be used to reduce the seat size, in particular for the control valve (Type 2301).



#### Definition DN

DN refers to the nominal diameter of the seat, not that of the port connection.

### 5.2 Properties

- High seal tightness due to self-adjusting packing glands (spindle seal element).
- High seat tightness due to swivel plate.
- Actuator can be seamlessly rotated by 360°.
- Maintenance-free under normal conditions.

#### 5.2.1 Options

- Control unit  
Depending on the requirements, various control unit variants are available.
- Stroke limit  
Limit of maximum opening / flow rate due to adjusting screw.
- Position feedback sensor  
The device is available with mechanical limit switches or inductive proximity switches.

### 5.2.2 Device variants

The globe valve is available for the following actuator sizes:  
ø 50 mm, ø 70 mm, ø 90 mm, ø 130 mm.

### 5.2.3 Restrictions



#### WARNING!

#### Risk of injury from pressure surge!

A pressure surge could cause lines and the device to burst.

Because of the risk of pressure surge, **valves with the flow direction above the seat must not be used for fluid media.**

- ▶ Observe the type of flow and type of medium for operating the device.

### 5.3 Intended area of application



Observe the maximum pressure range on the type label!

- For neutral gases and liquids up to 25 bar.
- Steam up to 230 °C.
- Hot water up to 200 °C.
- Aggressive media.

## 6 STRUCTURE AND FUNCTION

### 6.1 Structure

The globe valve consists of a pneumatically actuated piston actuator and a 2-way body.

The actuator is made from polyphenylene sulphide (PPS). The proven, self-adjusting packing gland guarantees a high degree of tightness. The stainless steel valve body aids in flow and facilitates high flow rates.

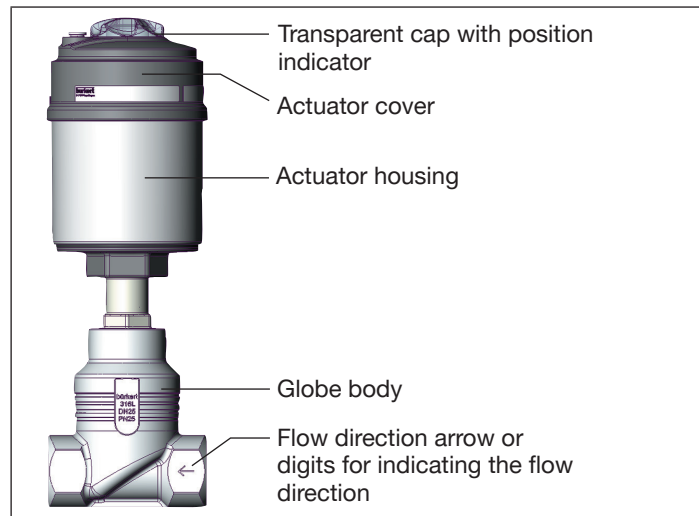


Image 1: Type 2101 globe valve, structure and description (1)



## Type 2101

### Structure and function

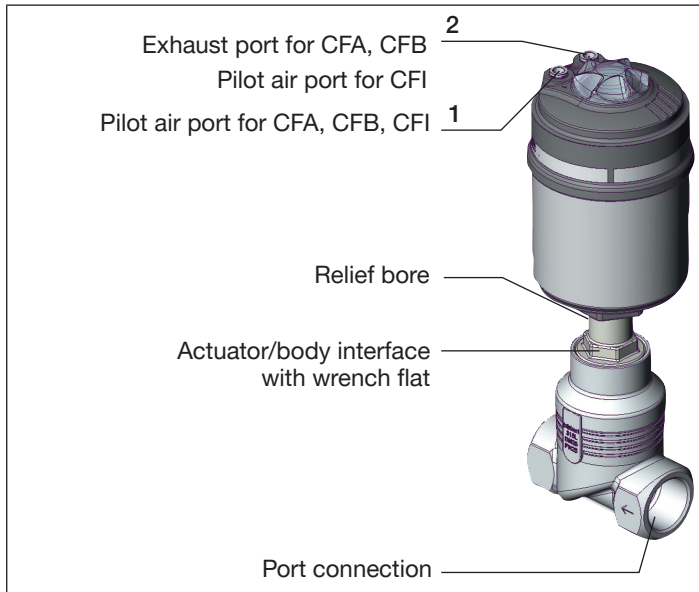


Image 2: Type 2101 globe valve, structure and description (2)

## 6.2 Function

Depending on the variant, the valve seat is closed in the direction of or against the medium flow.

Spring force (CFA) or pneumatic pilot pressure (CFB and CFI) generate the closing force on the swivel plate. 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.

<b>Control function A (CFA)</b> Closed by spring force in rest position	
<b>Control function B (CFB)</b> Opened by spring force in rest position	
<b>Control function I (CFI)</b> 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 (control function A, CFA) or pilot pressure (control function B or I, CFB or CFI).

As the medium is present under the swivel plate, the medium pressure contributes to the opening of 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 „7.4.2 Pressure ranges“.

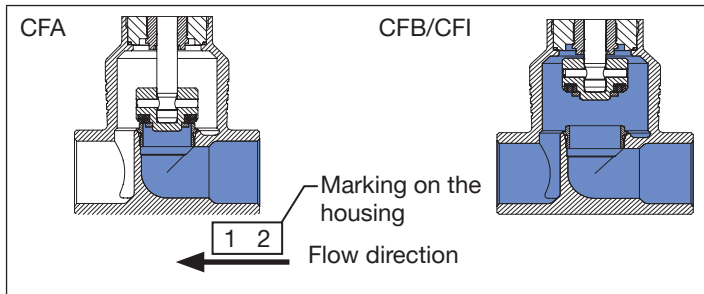


Image 3: Flow direction below seat  
(idle on/off, closing against medium)

### 6.2.3 Flow direction above the seat

The valve is closed with the medium flow via spring force (control function A, CFA). Because the medium pressure is above the swivel plate, it helps the valve close and also contributes to sealing the valve seat.

The valve opens via pilot pressure.

#### **WARNING!**

Risk of injury from pressure surge.

A pressure surge could cause lines and the device to burst. Because of the risk of pressure surge, **valves with the flow direction above the seat must not be used for fluid media.**

- ▶ Observe the type of flow and type of medium for operating the device.



In order to ensure complete opening, the minimum pilot pressure must be used!

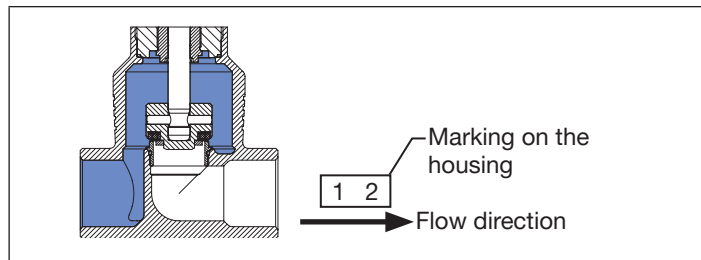


Image 4: Flow direction above the seat (idle off, closing with the medium)

## 7 TECHNICAL DATA

### 7.1 Conformity

The Type 2101 globe valve conforms to the EU Directives as per the EU Declaration of Conformity.

### 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:

DN (port connection)	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

### 7.3 Type label

Example:

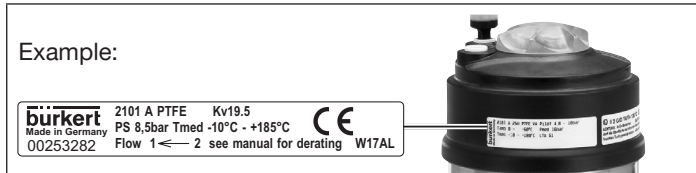


Image 5: Type label example



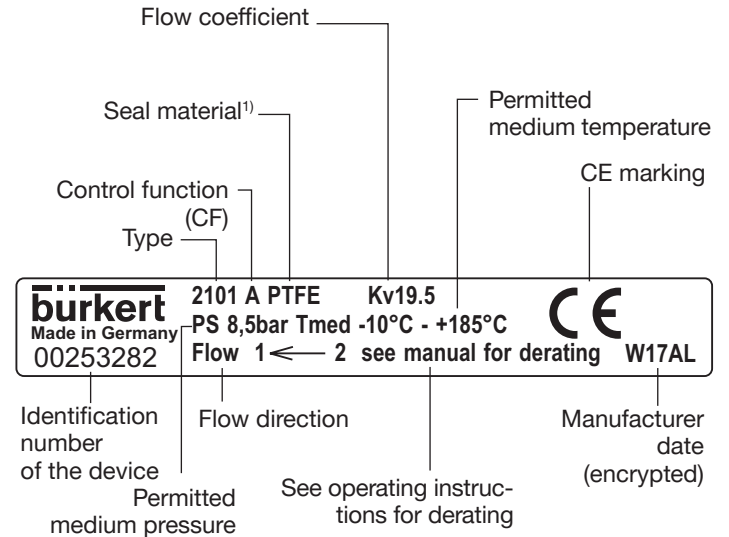
### WARNING!

#### Risk of injury from high pressure

Important, device-specific technical data are listed on the type label.

- Note the permitted pressure range on the device type label.

Example:



1) For a variant description see „7.5 General technical data“

## 7.4 Operating conditions

### 7.4.1 Temperature ranges

Actuator size [mm]	Actuator material	Medium (for PTFE and PEEK seal)	Environment <sup>2)</sup>
ø 50 , ø 70	PPS	-10 – +230 °C	-10 – +60 °C <sup>3)</sup>
ø 90, ø 130			-10 – +100 °C <sup>4)</sup>

Tab. 1: Temperature ranges



The globe valve is suitable for steam sterilisation.

### Derating pressure and temperature ranges

Usage limits of the valve (derating operating 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 as per 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

<sup>2)</sup> When using a pilot valve the maximum ambient temperature is +55 °C.

<sup>3)</sup> Pilot air connector as push-in connector

<sup>4)</sup> Control air connector as threaded bushing.

<sup>5)</sup> For device variant ø 70/DN 50/MC 13 the max. pilot pressure is limited to 7 bar.

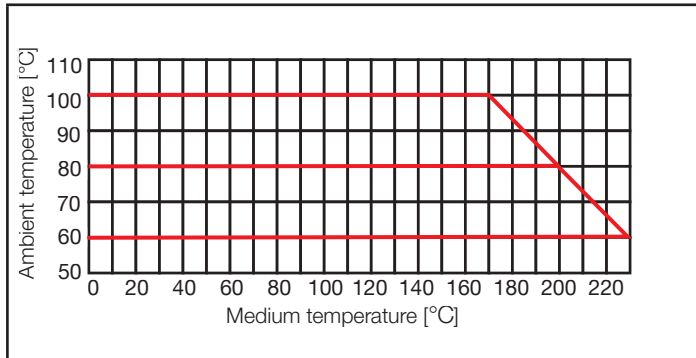


Image 6: Derating Element ANTG 50, 70, 90, 130

### 7.4.2 Pressure ranges

Actuator size [mm]	Maximum pilot pressure <sup>6)</sup>
ø 50, ø 70, ø 90	10 bar
ø 130	7 bar

Tab. 5: Pressure ranges

Medium pressure and pilot pressure for control function A, flow direction below seat (standard):

DN	Maximum medium pressure [bar]				Minimum pilot pressure [bar]			
	Actuator size ø [mm]				Actuator size ø [mm]			
	50	70	90	130	50	70	90	130
15	25	25	-	-	5.2	4.8	-	-
20	16	25	-	-	5.2	4.8	-	-
25	9.0	16	25	-	5.2	4.8	5.0	-
32	-	8.5	25	-	-	4.8	5.0	-
40	-	6.0	16	25	-	4.8	5.0	5.0
50	-	4.0	10	25	-	4.8	5.0	5.0
65	-	-	5.0	16(15 <sup>6)</sup> )	-	-	5.0	5.6
80	-	-	-	10	-	-	-	-
100	-	-	-	6.0	-	-	-	-

Tab. 6: Medium and pilot pressure CFA, standard

<sup>6)</sup> 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)

Medium pressure and pilot pressure for control function A, flow direction below seat, reduced spring force (EC04)

DN	Maximum medium pressure [bar]				Minimum pilot pressure [bar]			
	Actuator size $\phi$ [mm]				Actuator size $\phi$ [mm]			
	50	70	90	130	50	70	90	130
15	14	16			3.2	2.5	-	-
20	6	12	-					
25	3	6						
32		3.5	9		-	2.5	2.5	
40		2	6	16				
50	-		3.5	10	-	-	-	3.2
65			-	7.5				
80				5				

Tab. 7: Medium and pilot pressure CFA, reduced spring force (EC04)

Required minimum control pressure depending on the medium pressure

In the following graphs the required minimum control pressure is shown for control functions A, B and I depending on the medium pressure.

Control function A, flow direction above the seat

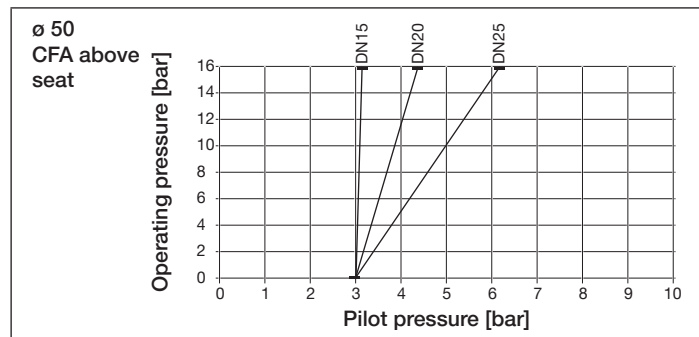


Image 7: Pressure diagram, actuator  $\phi$  50 mm, control function A, flow direction above the seat.

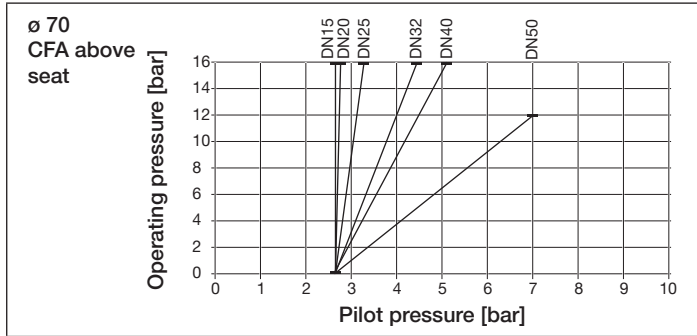


Image 8: Pressure diagram, actuator ø 70 mm, control function A, flow direction above the seat

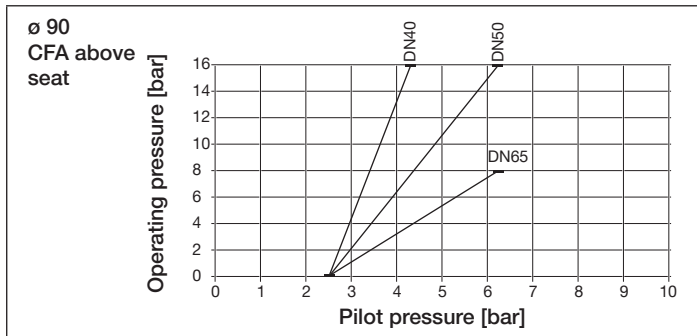


Image 9: Pressure diagram, actuator ø 90 mm, control function A, flow direction above the seat

**Control function B and I, flow direction below seat**

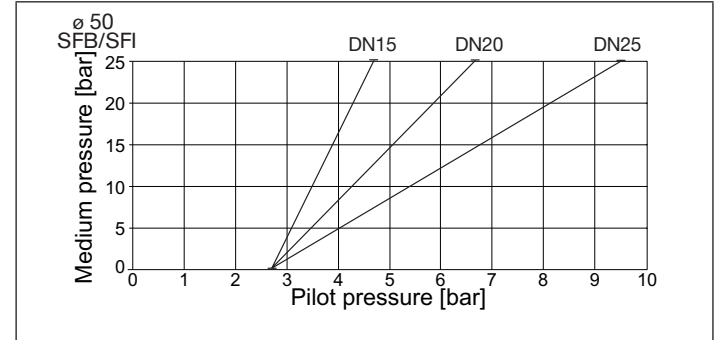


Image 10: Pressure diagram, actuator ø 50 mm, control function B and I, flow direction below seat

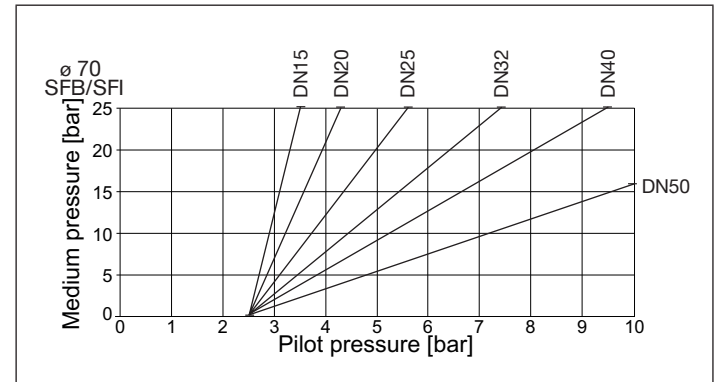


Image 11: Pressure diagram, actuator ø 70 mm, control function B and I, flow direction below seat

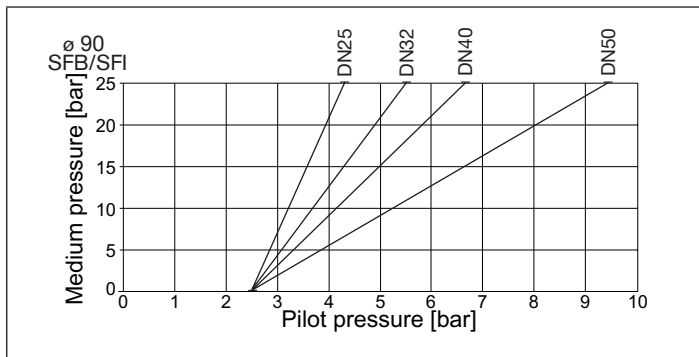


Image 12: Pressure diagram, actuator ø 90 mm, control function B and I, flow direction below seat

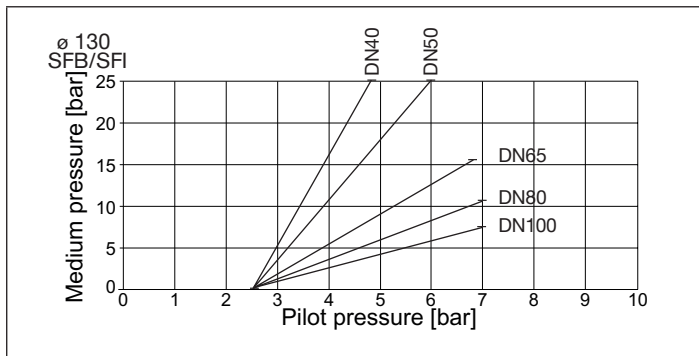


Image 13: Pressure diagram, actuator ø 130 mm, control function B and I, flow direction below seat

## 7.5 General technical data

Actuator size	See type label
Control function	See type label, for description of control functions see chapter „6.2“

### Media

Control medium	Neutral gases, air
Flow media	Water, alcohols, fuels, hydraulic fluids, saline solutions, lyes, organic solvents

### Materials

Valve body	316L
Actuator	PPS and stainless steel
Sealing elements	FKM and EPDM
Spindle seal	PTFE V-rings with spring compensation (with silicone grease)
Seat seal	PTFE (NBR, EPDM, FKM, PEEK on request)
Swivel plate	
Spindle	1.4401/1.4404
Spindle guide up to DN65	PEEK
from DN80	1.4401/1.4404



Ports	
Pilot air port	Push-in connector 6/4 mm or 1/4" more on request
Medium connection	Socket: G ½–G 4 (NPT, RC on request) Welded connection: as per ISO 4200, DIN 11850 R2 other connections on request
Degree of protection	IP67 as per IEC 529/EN 60529

## 8 INSTALLATION

### 8.1 Safety instructions



#### **DANGER!**

**Risk of injury due to high pressure and escaping medium.**

- ▶ Before working on the device or system, switch off the pressure. Vent or empty the lines.



#### **WARNING!**

**Risk of injury due to improper assembly!**

- ▶ Only trained technicians may perform installation work.
- ▶ Perform installations using suitable tools only.

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

- ▶ Secure equipment against unintentional activation.
- ▶ Ensure that the system starts up in a controlled manner only.

**For control function I – risk of pilot pressure failure.**

The valve stays in an undefined position in the event of a pilot pressure failure.

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

**Risk of injury due to moving parts.**

- ▶ Do not reach into openings in the device.



## 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 valve is possible, preferably with the actuator facing upward.
- Ensure that pipelines are aligned before connecting the valve.
- Note flow direction (see type label).

### 8.2.1 Preparatory work

- Clear impurities from pipelines (seal material, metal chips, etc.).

### 8.2.2 Removing actuator from the valve body

For 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 (see chapter on installation in the operating instructions of the corresponding control unit).

- Clamp valve body into a collet.

#### 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 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.

**For other device variants:**

- Only uninstall the actuator if required by the customer.

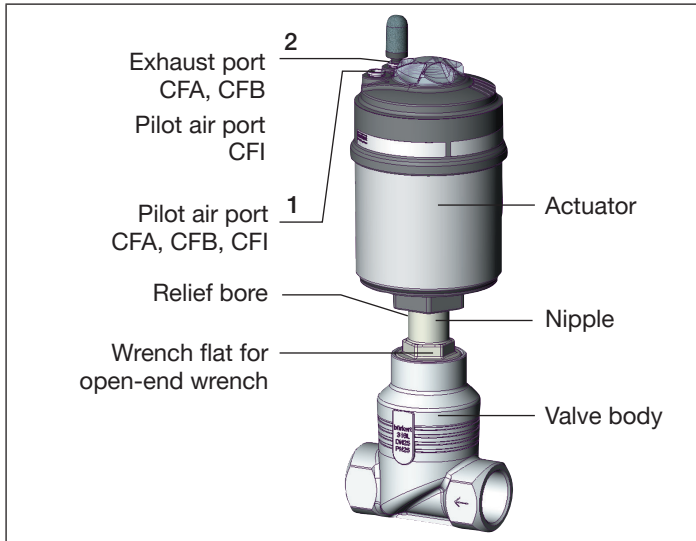


Image 14: Installation

## 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. 8: Tightening torques valve body/nipple](#)“).

### Dirt trap for devices with approval according to DIN EN 161

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

- If the approval also applies to the stainless steel valve body, such a dirt trap must be attached in front of the globe 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 Install actuator (welded connection)

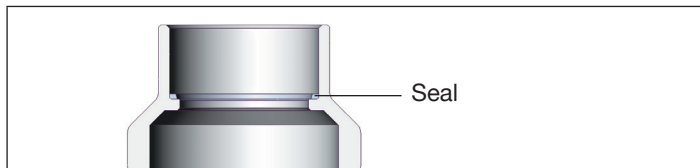


Image 15: Seal

→ 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.

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

#### **NOTE!**

##### Damage to the 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 with compressed air (5 bar): Valve opens.

→ Screw actuator into the valve body. Observe tightening torque (see „Tab. 8: Tightening torques valve body/nipple“).

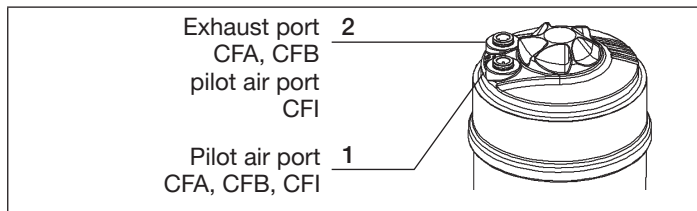


Image 16: Ports

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

Tab. 8: Tightening torques valve body/nipple

### 8.3.3 Install control unit



For a description see chapter "Installation" in the operating instructions for the corresponding control unit.

### 8.3.4 Turning actuator

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

#### NOTE!

##### Damage to the 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 pressurise the pilot air port 1 with compressed air (5 bar): Valve opens.
- Counter with a suitable open-end wrench on the wrench flat of the nipple.
- Place a suitable open-end wrench on the hexagon head of the actuator.



#### 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 „Image 17“)

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

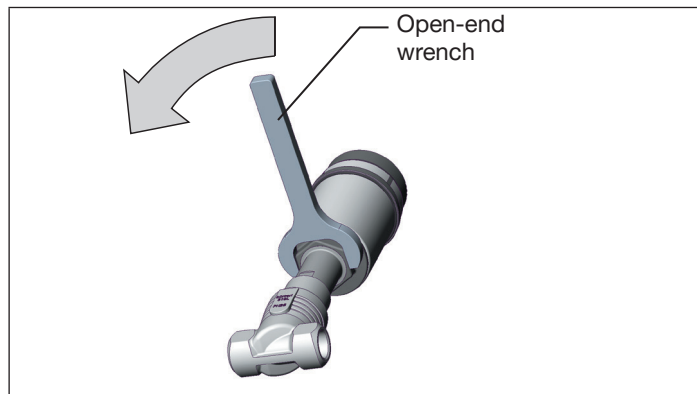


Image 17: Rotating with open-end wrench

## 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!

**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.

**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.

### 8.4.1 Connecting the control medium



If the position of the pilot air ports is unfavourable for installing the hoses, these can be seamlessly aligned by rotating the actuator by 360°.

The procedure is described in chapter „8.3.3 Install control unit“.

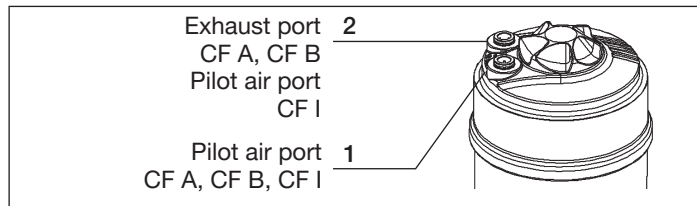


Image 18: Ports

#### Control function A and B:

→ Connect control medium to pilot air port 1 of the actuator (see „Image 18“).

#### Silencer

For devices with push-in connection, the silencer to reduce the exhaust air volume is supplied unattached.

→ Connect the silencer to the free exhaust port 2 (see „Image 18“).



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

### Control function I:

- Connect control medium to pilot air port 1 and 2 of the actuator (see „Image 19: Ports“)
- Pressure on pilot air port 1 opens the valve.
- Pressure on pilot air port 2 closes the valve.

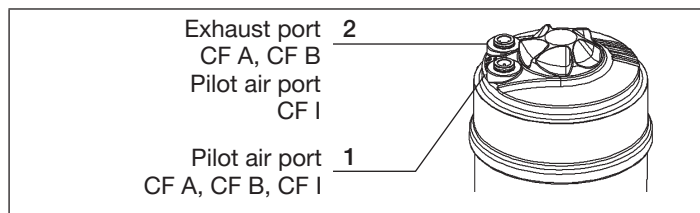


Image 19: Ports

### Pilot air hose:

Pilot air hoses of sizes 6/4 mm or 1/4" can be used.  
Optionally a pilot air port via G 1/8 thread is possible.

## 8.5 Start-up

Perform the Teach function after installing the device. This function presets the closed-loop control parameters.



For a description, please refer to the operating instructions of the control unit.

## 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:

- Disconnect the pneumatic connection.
- Disassemble the device.

## 9 ELECTRICAL CONTROL UNIT

The Type 2101 valve can be combined with the following control units:

- Type 8690 Pneumatic control unit
- Type 8691 Control head (actuator size  $\varnothing 70$ – $\varnothing 130$ )
- Type 8695 Control head (actuator size  $\varnothing 80$ )
- Type 8645 Automation system FreeLINE
- Type 6012 Pilot valve
- Type 6014 P Pilot valve



The electrical port of the pilot valve or the control units is described in the respective operating instructions of the pilot valve/control unit.

## 10 MAINTENANCE, CLEANING

### 10.1 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.

##### **Risk of injury from electric shock!**

- ▶ Before reaching into the system, switch off the power supply and secure against reactivation!
- ▶ Observe the applicable accident prevention and safety regulations for electrical devices!



#### **WARNING!**

##### **Risk of injury due to improper maintenance work!**

- ▶ Maintenance may be carried out by authorised technicians only!
- ▶ Use an open-end wrench, never a pipe wrench, to screw the valve body or actuator in or out, and observe the tightening torque.

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

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



#### **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 moving parts in the device!**

- ▶ Do not reach into openings.

### 10.2 Maintenance work

#### **Actuator:**

When used in accordance with these operating instructions, the actuator of the globe valve is maintenance-free.

#### **Wearing parts of the globe valve:**

Parts which are subject to natural wear are:

- Seals
- Swivel plate

→ If there is a leak, replace the respective wearing part with a corresponding spare part. (For spare part sets and assembly tools see chapter „12 Spare parts“).



Replacement of the wearing parts is described in chapter „12 Spare parts“.



### Visual inspection:

According to the usage conditions, perform regular visual inspections:

- Check medium ports for tightness.
- Check relief bore on the pipe for leaks.

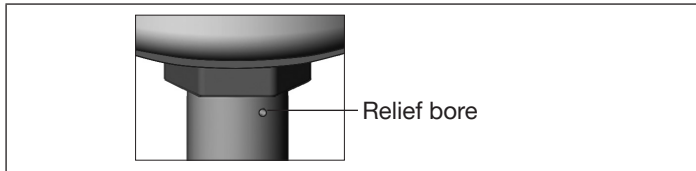


Image 20: Relief bore

### 10.2.1 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 body materials and seals.

## 10.3 Replacing wearing parts

### 10.3.1 Replacing the valve seat

The valve set consists of

- swivel plate with seal
- pin
- seal

To change the valve set, first remove the actuator from the valve body.



#### 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.



#### WARNING!

**Risk of injury due to using wrong tool!**

Performing installation work, using unsuitable tools, is hazardous due to possible damage to the device.

- ▶ To remove the actuator from the valve body, use an open-end wrench, never a pipe wrench.

**Remove actuator from the valve body:**

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

**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 and I pressurise the pilot air port 1 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.

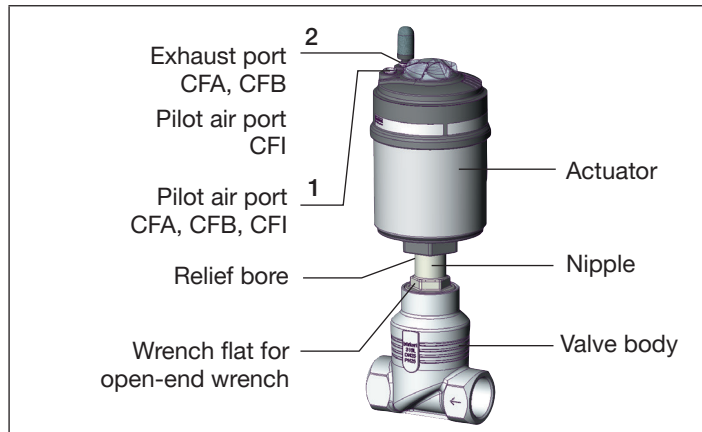


Image 21: Part designation

**Replacing valve set**

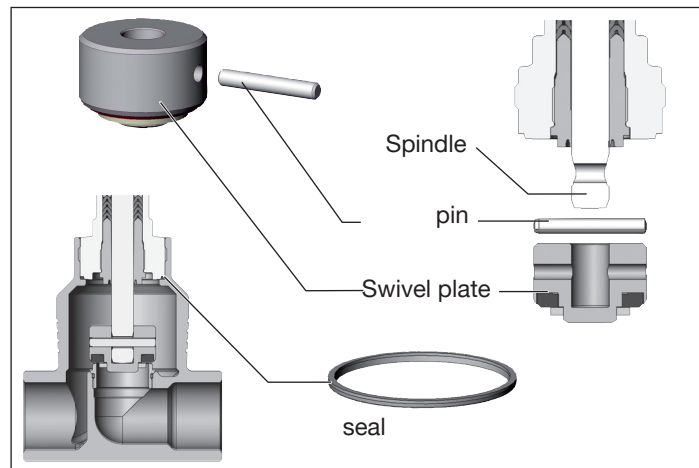


Image 22: Valve set

- Support swivel plate on the cylindrical part using a prism or something similar.
- Knock out pin using a suitable pin punch.  
**Pin punch  $\varnothing$  3 mm**, for 10 mm spindle diameter on the swivel plate.  
**Pin punch  $\varnothing$  5 mm**, for 14 mm spindle diameter on the swivel plate.
- Remove swivel plate.
- Connect new swivel plate to the spindle.
- Align boreholes in the swivel plate and spindle.

- Support swivel plate on the cylindrical part using a prism or something similar.
- Insert pin into the borehole.
- Caulk pin boreholes on both sides of the swivel plate using a chisel or centre punch.

#### Installing actuator on valve body

- Replace the seal if necessary.



#### 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.

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

#### NOTE!

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

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

- For control function A and I pressurise the pilot air port 1 with compressed air (5 bar): Valve opens.
- Screw actuator into the valve body. Observe tightening torque (see „Tab. 9: Tightening torques valve body/nipple“).

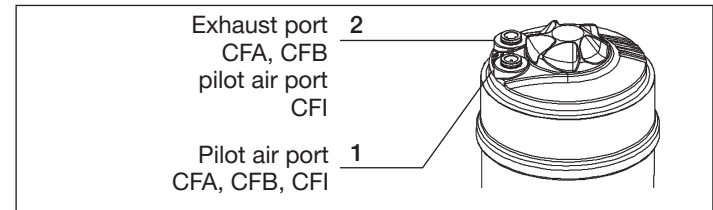


Image 23: Ports

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

Tab. 9: Tightening torques valve body/nipple



If the position of the pilot air ports is unfavourable for installing the hoses, these can be seamlessly aligned by rotating the actuator by 360°.

The procedure is described in chapter „8.3.3 Install control unit“.

### 10.3.2 Replacing the valve seat set



The actuator must be uninstalled when replacing the valve seat.

The necessary steps are described in chapter „10.3.1 Replacing the valve seat“ on page 25.

The valve seat set consists of

- valve seat
- seal
- O-ring (depending on variant)
- lubricant



#### **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.



#### **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.

- ▶ Only perform the replacement with special assembly tools (for order numbers see chapter „12.2 Installation tools“).
- ▶ Observe tightening torque (see „Tab. 10“ and „Tab. 11“).

**Procedure:**

- Replace the valve seat as described below when the actuator is removed.

**Replacing valve seat**

- Use the assembly tool (with suitable tool attachment) and a wrench to unscrew the old valve seat.
- Clean the body thread and seal surface with compressed air.
- Attach a new valve seat to the assembly tool.

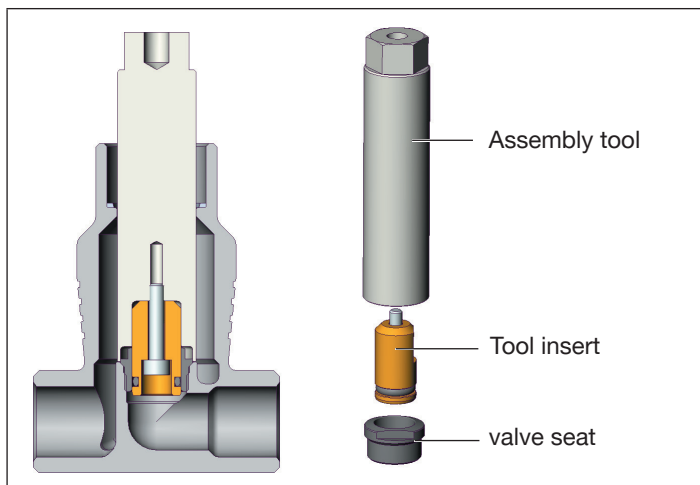


Image 24: Replacing the valve seat



**WARNING!**

**Danger 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.
- Grease the valve seat thread using a lubricant (e.g. Klüber-paste UH1 96-402 from Klüber).
- Manually screw attached valve seat into the body thread.
- Tighten valve seat using torque wrench. Observe tightening torque (see „Tab. 10“).

Valve seat size	Tightening torque [Nm]
	Coated valve seat
15	20 ± 3
20	28 ± 3
25	40 ± 5
32	65 ± 5
40	85 ± 8
50	120 ± 8
65	150 + 10
80	180 + 10
100	220 + 10

Tab. 10: Tightening torques valve seat assembly

**Install actuator (with control unit) on the valve body**

→ Replace the seal if necessary.



**WARNING!**

**Danger 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.

→ 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 and I**

**Without control unit:** Pressurise 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.

→ Screw actuator into the valve body. Observe tightening torque (see ["Tab. 11"](#)).

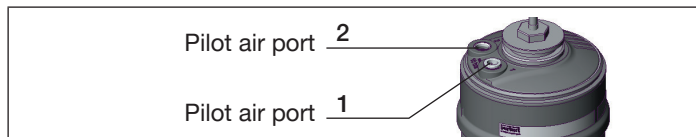


Image 25: Ports

**Tightening torques valve body/nipple**

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

Tab. 11: Tightening torques valve body/nipple



If the position of the pilot air ports is unfavourable for installing the hoses, these can be seamlessly aligned by rotating the actuator by 360°.

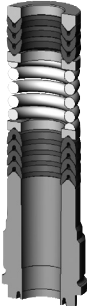

The procedure is described in chapter [„8.3.4 Turning actuator“](#) on page 21.

### 10.3.3 Replacing the packing gland



For device combination  $\varnothing 70/\text{DN}50$ , replacing the packing gland will be possible as of series-production status January 2017.

The seal set for the packing gland includes

<p><b>SP10/SP14</b></p> <ul style="list-style-type: none"> <li>• 1 support ring</li> <li>• 7 chevron seals</li> <li>• 2 thrust collars</li> <li>• 1 compression spring</li> <li>• 1 spindle guide</li> <li>• 1 seal</li> <li>• lubricant</li> </ul>	
<p><b>SP22</b></p> <ul style="list-style-type: none"> <li>• 1 support ring</li> <li>• 7 chevron seals</li> <li>• 2 thrust collars</li> <li>• 1 compression spring</li> <li>• 1 spacer</li> <li>• 1 seal</li> <li>• lubricant</li> </ul>	

Tab. 12: Seal set for packing gland



#### **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.



#### **WARNING!**

**Risk of injury due to using wrong tool!**

Performing installation work, using unsuitable tools, is hazardous due to possible damage to the device.

- ▶ To remove the actuator from the valve body, use an open-end wrench, never a pipe wrench.
- ▶ To replace the packing gland, use special installation wrench, modified socket wrench or open-end wrench.
- ▶ Observe tightening torques.

To replace the packing gland, first remove the actuator from the valve body and remove the swivel plate.

### Removing actuator from the valve body

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

### 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 and I pressurise the pilot air port 1 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.

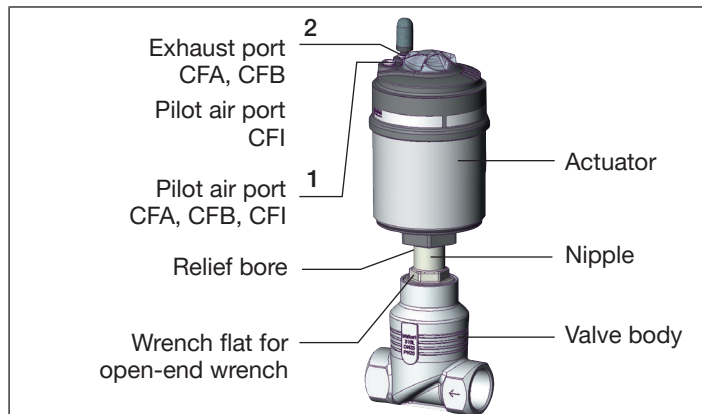


Image 26: Part designation

### Removing swivel plate

- Knock out pin using a suitable pin punch.  
Pin punch  $\varnothing$  3 mm, for 10 mm spindle diameter on the swivel plate.  
Pin punch  $\varnothing$  5 mm, for 14 mm spindle diameter on the swivel plate.
- Remove swivel plate.

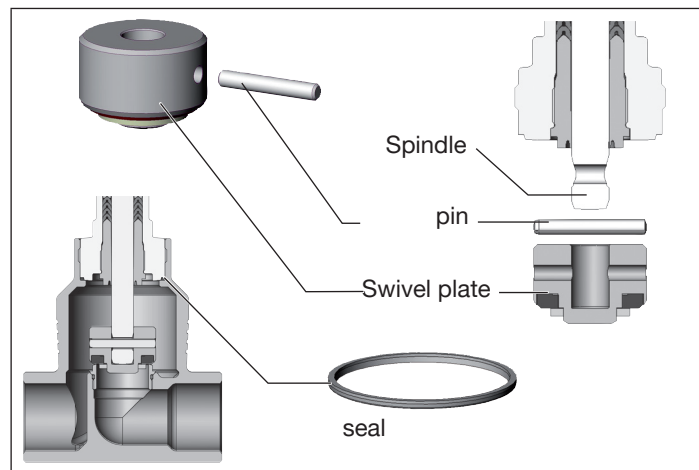


Image 27: Valve set



**Replacing packing gland**

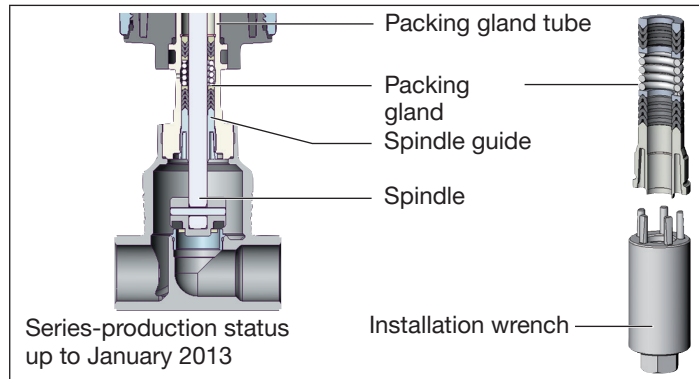


Image 28: Changing packing gland (series-production status up to January 2013)

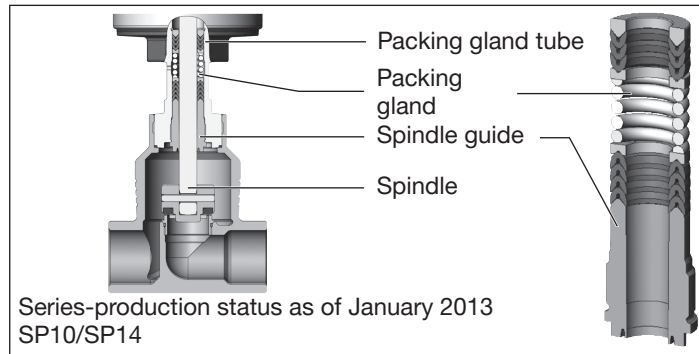


Image 29: Changing packing gland SP10/SP14 (series-production status as of January 2013)

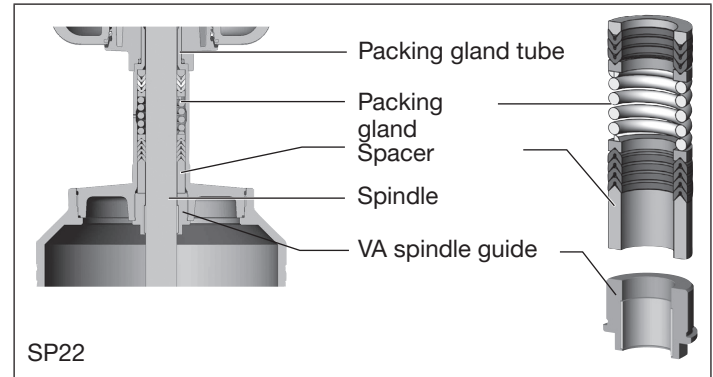


Image 30: Replacing the packing gland SP22

Series-production status up to January 2013:

→ Unscrew spindle guide using the installation wrench<sup>7)</sup> and an open-end wrench.

Series-production status as of January 2013 SP10/SP14:

→ Unscrew spindle guide using a modified socket wrench<sup>7)</sup>.

SP22:

→ Unscrew VA spindle guide using an open-end wrench.

<sup>7)</sup> The assembly wrench or modified socket wrench are available from your Bürkert sales department.



**WARNING!**

**Risk of injury due to parts being ejected!**

When the spindle opening is exposed, the individual parts of the packing gland will be pressed out at an undefined speed when the pilot air port is pressurised.

- ▶ Before pressurising with pilot air, safeguard the area around the outlet, (e.g. place spindle on a firm surface).

- For **control function A and I** pressurise the pilot air port **1** with 6–8 bar (see „Image 26: Part designation“).
- For **control function B** pressurise the pilot air port **2** with 6–8 bar (see „Image 26: Part designation“).
- Grease the individual parts of the new packing gland with the supplied lubricant.
- Place individual parts on the spindle in the specified direction and sequence (as shown in „Image 31: Seal set for packing gland“).
- Push the packing gland into the packing gland tube.
- Screw in spindle guide/VA spindle guide again using the socket wrench/open-end wrench. Observe tightening torque (see „Tab. 13: Tightening torques spindle guide“)!

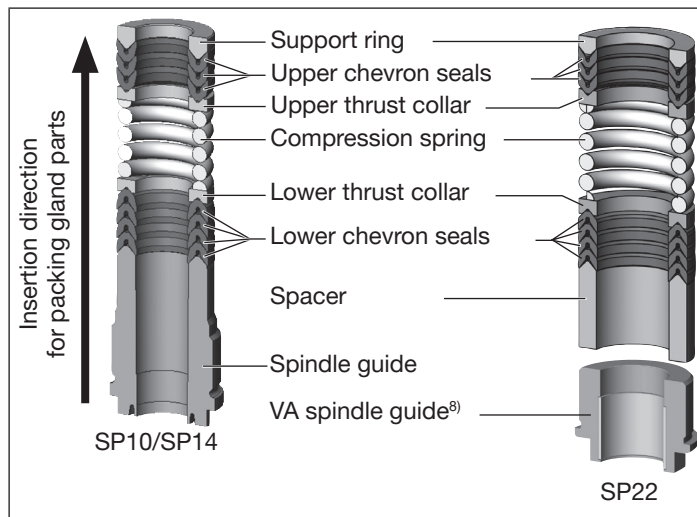


Image 31: Seal set for packing gland

Tightening torques spindle guide	
Spindle diameter	Tightening torque [Nm]
10 mm	6
14 mm	15
22 mm	60

Tab. 13: Tightening torques spindle guide

<sup>a)</sup> Is not included in the seal set.

### Installing swivel plate

- Connect swivel plate to the spindle.
- Align boreholes in the swivel plate and spindle.
- Support swivel plate on the cylindrical part using a prism or something similar.
- Insert pin into the borehole.
- Caulk pin boreholes on both sides of the swivel plate using a chisel or centre punch.

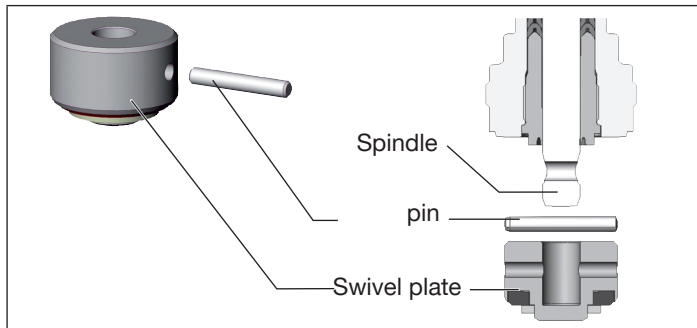


Image 32: Swivel plate

### Installing actuator on valve body

For a description see  
[„Installing actuator on valve body“](#) on page 27.

## 11 FAULTS

Fault	Elimination
Actuator does not switch	Pilot air port interchanged <sup>9)</sup> CFA → Connect pilot air port 1 CFB → Connect pilot air port 1 CFI → Pilot air port 1: open Pilot air port 2: closing
	Pilot pressure too low → Observe pressure specifications on the type label
	Medium pressure too high → Observe pressure specifications on the type label
	Flow direction interchanged → Observe direction of arrow on the type label

<sup>9)</sup> see [„8.4 Pneumatic connection“](#)

Fault	Elimination
Valve is not tight	Dirt between seal and valve seat → Install dirt trap
	Valve seat seal worn → Install new swivel plate
	Flow direction interchanged → Observe direction of arrow on the type label
	Medium pressure too high → Observe pressure specifications on the type label
	Pilot pressure too low → Observe pressure specifications on the type label
Valve is leaking on the relief bore	Packing gland worn → Replace packing gland or actuator

## 12 SPARE PARTS



### WARNING!

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

The actuator contains a spring under tension. The spring that ejects when the actuator opens may cause injuries.

- ▶ The actuator must not be opened.



### CAUTION!

#### Risk of injury and/or damage due to incorrect parts!

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

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

### 12.1 Replacement part set

The following replacement part sets are available for the globe valve Type 2101:

- **Valve set**, consists of swivel plate with seal, pin and seal.
- **Seal set for packing gland**, consisting of the individual parts of the packing gland, seal and lubricant (the modified socket wrench is not included in the seal set).
- **Valve seat set**, consists of valve seat, O-ring (depending on variant) and seal.

Valve set (PTFE seal)	
Orifice DN	Order number
15	149 606
20	011 171
25	160 737
32	011 208
40	011 209
50	216 431
50 (actuator size $\varnothing$ 70) <sup>10)</sup>	307 392
65	241 777
80	155 492
100	155 493

Tab. 14: Valve set (PTFE seal)

Seal set for packing gland				
Body DN	Actuator size	Order number Standard variant	Order number Water outlet (up to 200 °C)	Order number high-temperature outlet (up to 230 °C)
15–50 <sup>10)</sup>	$\varnothing$ 50	216 433	372 661	372 662
	$\varnothing$ 70			
32–65	$\varnothing$ 90	216 435	372 653	372 655
	$\varnothing$ 130			
80–100	$\varnothing$ 130	252 545	–	200 23063

Tab. 15: Seal set for packing gland

<sup>10)</sup> As of series-production status January 2017, switch also possible for DN50 spindle  $\varnothing$  10.

VA spindle guide for packing gland			
Spindle $\varnothing$	Orifice DN	Actuator size	Order number
22	80–100	$\varnothing$ 130	252 543

Tab. 16: VA spindle guide for packing gland

Valve seat set	
Includes: valve seat, O-ring (depending on variant), seal	
Orifice DN	Order number
15	262152
20	262157
25	262170
32	262174
40	262177
50	262179
65	262204
80	262207
100	262210

Image 33: Valve seat set

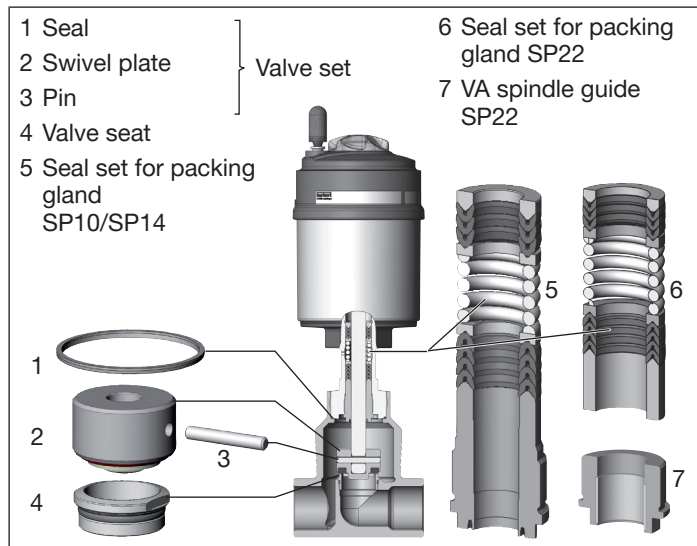


Image 34: Spare parts

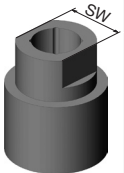
## 12.2 Installation tools

**Assembly key for packing gland**  
(only for dismantling packing gland until January 2013)

Installation wrench	Orifice DN	Order number
Spindle $\varnothing$ 10 mm	15–40	665 700
Spindle $\varnothing$ 14 mm	32–65	665 701

Tab. 17: Installation wrench

**Modified socket wrench for packing gland  
(series-production status as of January 2013)**

	<b>Socket wrench</b>	<b>DN</b>	<b>AF</b>	<b>Order number</b>
	Spindle Ø 10 mm	15–50 <sup>11)</sup>	19	683 221
	Spindle Ø 14 mm	32–65	21	683 223

<sup>11)</sup> As of series-production status January 2017 also for DN50

Tab. 18: Modified socket wrench

**Assembly tools for replacing valve seat**

Orifice DN	Order number
15	652 604
20	652 605
25	652 606
32	652 607
40	652 608
50	652 609
65	655 562
80	655 563
100	655 564

Tab. 19: Assembly tool for replacing valve seat



If you have any questions, please contact your Bürkert sales department.

## 13 TRANSPORT, STORAGE, PACKAGING

### NOTE!

#### Transport damage!

Inadequately protected devices may be damaged during transport.

- ▶ Protect the device against moisture and dirt in shock-resistant packaging during transport.
- ▶ 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 parts contaminated with media.

- ▶ Dispose of the device and packaging in an environmentally friendly manner.
- ▶ Observe applicable disposal and environmental regulations.



Observe national waste disposal regulations







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